The Debt-Contracting Value of Accounting Information and Loan Syndicate Structure[*]

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Abstract

In this paper, we empirically investigate how the debt-contracting value of accounting information influences the optimal mix of delegated monitoring mechanisms in syndicated loan deals of publicly traded borrowers. More specifically, we explore economic relations between three alternative monitoring mechanisms: (1) direct, relationship-based monitoring by the lead arranger of a syndicated deal, (2) arms length monitoring via publicly available accounting information, and (3) credit ratings produced by independent rating agencies. We hypothesize that as the ability of publicly reported accounting numbers to capture changes in credit quality in a timely fashion increases (i.e., debt-contracting value of accounting increases), arms length monitoring based on accounting information will be increasingly substituted for direct, relationship-based monitoring by the lead arranger of a syndicated deal. Further, we hypothesize that accounting information with high debt-contracting value is relatively more important as a substitute mechanism for relationship-based monitoring when the borrower is not rated by a credit agency and when *ex post* monitoring by the lead arranger will require relatively more effort. Using observable changes in credit quality, we estimate a direct proxy for the debt-contracting value of accounting and document evidence consistent with both of our hypotheses. Finally, we exploit the existence of performance pricing provisions in syndicated loan contracts to investigate how the debt-contracting value of accounting influences the choice of the performance measure used in these provisions. We predict and find that for loans that include performance pricing provisions, the likelihood that the single performance measure used in the provision will be an accounting ratio rather than a credit rating increases as the debt-contracting value of accounting information improves.

Keywords: Syndicate Structure, Performance Pricing, Performance Measures, Debt Contracting, Syndicated Loans, Earnings Quality

1. INTRODUCTION

Information asymmetries between contracting parties fundamentally impact the design of optimal debt-financing arrangements (e.g., Leland and Pyle, 1977; Diamond, 1984, 1991; Aghion and Bolton, 1992; Holmström and Tirole, 1997). The impact of information asymmetries on contract design is manifested in key contractual features such as loan amount, interest rate, loan maturity, and the choice of monitoring mechanisms. In this paper, we empirically investigate how the debt-contracting value of accounting information influences the optimal mix of delegated monitoring mechanisms for syndicated loan deals of publicly traded borrowers.

More specifically, we explore economic relations between three alternative monitoring mechanisms: (1) direct, relationship-based monitoring by the lead arranger of a syndicated deal, (2) arms length monitoring via publicly available accounting information, and (3) credit ratings produced by independent rating agencies. We hypothesize that as the ability of publicly reported accounting numbers to capture credit quality changes on a timely basis increases (i.e., debt-contracting value of accounting increases), arms length monitoring relying on accounting information will be increasingly substituted for the more costly, relationship-based monitoring by the lead arranger. Further, we hypothesize that accounting information with high debt-contracting value is relatively more important as a substitute mechanism for relationship-based monitoring when the borrower is not rated by a credit agency and when *ex post* monitoring will require relatively more effort to be expended by the lead arranger of the syndicated loan deal. We provide empirical evidence consistent with our predictions.

Existing theories explore the role of information asymmetry in explaining key differences between relationship oriented, single-lender bank loans where the lender holds the whole loan and public debt where an underwriter retains none of the loan (e.g., Diamond, 1991; Boot and

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Thakor, 2000). Syndicated loans lie on a continuum between these two extremes. Syndicated loan deals are characterized by the existence of a lead arranger who establishes a relationship with the borrowing firm, negotiates terms of the contract, and organizes a syndicate of participant lenders who each fund part of the loan. Given information asymmetries, the multi-party nature of loan syndicates creates a demand for delegation of monitoring activities to mitigate costly duplication of monitoring efforts and potential free-riding problems (e.g., Holmström, 1982; Diamond, 1984). While direct monitoring by lead arrangers seems natural, the issue is complicated by the existence of information asymmetries between the lead arranger and other syndicate participants as well as diversification costs incurred by the lead arranger.

Lead arrangers may *ex ante* possess private information about the borrower not known to other syndicate members. In addition, unobservability of *ex post* monitoring effort creates potential for shirking, resulting in a demand for lead arrangers to retain a higher percentage of the loan.[1] While retaining a larger portion of a loan creates monitoring incentives (e.g., Holmström and Tirole, 1997), it is potentially costly as increased exposure to a single borrower restricts diversification of the lead arranger's loan portfolio. Given such costs, syndicate structures will incorporate alternative monitors when it is beneficial. In equilibrium, syndicate structure reflects delegated monitoring configurations that optimally trade off costs and benefits across alternative mechanisms.

One alternative is to consider monitoring mechanisms that rely on publicly reported accounting data of borrowers. Financial accounting systems provide a credible, low cost information set that forms the foundation of the firm-specific information set available for

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[1] The relative importance of moral hazard versus adverse selection problems in shaping syndicated loan structures is an open question. For example, Sufi (2006) provides evidence consistent with moral hazard being the dominant issue, while Wittenberg-Moerman (2006b) supports an adverse selection story. We rely primarily on a moral hazard story to motivate our hypotheses.

addressing agency problems. Publicly available accounting information can support arms length

monitoring activities by loan syndicate participants without a direct relationship with the

borrower.[2] In addition, contracting theory supports a crucial role for informative, verifiable

performance measures in formal contracting arrangements (e.g., Jensen and Meckling, 1976;

Holmström, 1979; Watts and Zimmerman, 1986; Leftwich, 1983). A key premise of our paper

is that the debt-contracting value of accounting information varies across firms and industries.

We conceptualize the debt-contracting value of accounting information as the ability of publicly

reported accounting data to capture changes in the credit quality of a borrower on a timely basis.

Inherent limitations in the ability of a borrower's accounting numbers to reflect changes in credit

quality in a timely fashion limit the reliance placed by syndicate members on accounting data as

a monitor of credit quality.[3] We argue that as the debt-contracting value of accounting decreases,

equilibrium governance structures of loan syndicates will rely more heavily on monitoring by

the lead arranger, and thus will require the lead arranger to retain a larger percentage of the

syndicate loan for incentive purposes.

Examining this hypothesis empirically requires that we measure cross-sectional differences

in the debt-contracting value of accounting. However, there exists a plethora of measurable

properties of accounting data that could potentially create debt-contracting value. In an attempt

to parsimoniously isolate the central importance of accounting data in the optimal design of

syndicate structure, we exploit observable changes in credit quality to estimate a direct proxy for

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[2] The arms length monitoring role of accounting information is recognized as a key element in supporting the existence of liquid, public capital markets (e.g., Ball, 2001; Black, 2001; Bushman and Smith, 2001; Watts and Zimmerman, 1986). For example, market monitoring is posited as a key mechanism for the prudential regulation of banks as evidenced by Pillar 3 (Market Discipline) of the Basle II Accord (BIS, 2003).

[3] We estimate all of our accounting measures at the industry level in an attempt to capture inherent properties of accounting data and abstract away from idiosyncratic, firm-specific issues such as earnings management. A significant research stream explores the hypothesis that managers make accounting choices to avoid violation of accounting-based debt covenants. See for example Watts and Zimmerman (1986), Dichev and Skinner (2002), Beatty and Weber (2003), and Hostak (2005).

the debt-contracting value of accounting. Our primary measure is the goodness-of-fit from a model where credit ratings downgrades are modelled as a function of lagged seasonally-adjusted accounting earnings. This variable measures the extent to which reported earnings as a stand-alone measure captures timely information concerning changes in credit quality. We choose this simple measure because it directly connects accounting information to changes in credit quality, and we believe that it is an appropriate measure with which to examine the central role played by accounting information in the design of optimal syndicate structures. While it is beyond the scope of this paper to examine the whole range of accounting properties that may capture elements of accounting's debt-contracting value, we also consider several other prominent properties of accounting information. Specifically, we estimate timely loss recognition along the lines of Basu (1997) and also estimate the extent to which current earnings capture the information set underlying contemporaneous changes in stock price using the R^2 from a regression of stock returns on current earnings.[4,5]

It is also the case that credit rating agencies can serve an important delegated monitoring role. Rating agencies have a reputational stake in providing informative credit ratings to the market. Credit ratings are generally assigned by a committee based on a rigorous process that incorporates a wide range of information, including potentially private information provided by

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[4] Timely accounting recognition of economic losses is a commonly used proxy for accounting conservatism. The potentially important role played by conservative accounting in debt contracting is well known in the literature (e.g., Watts and Zimmerman, 1986; Ball, 2001; Watts, 2003a,b). Several papers examine efficiency gains from accounting conservatism and/or timely loss recognition in debt contracts (e.g., Ahmed et al., 2002; Zhang, 2004; Ball et al., 2006; Beatty et al., 2006; Wittenberg-Moerman, 2006a; Vasvari, 2006). In robustness tests, we also examine a number of other common proxies for accounting conservatism. Results using our direct measure of debt-contracting value hold regardless of which measures of conservatism we include in the model.

[5] We examine earnings timeliness in a debt contracting setting. In the context of shareholder governance Bushman et al. (2004) investigates how board structure, equity incentives of directors, ownership concentration and executive compensation vary with earnings timeliness measured using a variant of this R^2 measure. They hypothesize that the extent to which current accounting numbers capture the information set underlying current value changes is a fundamental determinant of their governance value to stakeholders, and predict that firms substitute costly governance mechanisms to compensate for low earnings timeliness.

firm managers.[6]

Existing research documents that the percentage retained by the lead arranger is an increasing function of information asymmetry measured by whether firms are private or public and whether the firm has a credit rating.[7] We extend this literature in several important ways. In our first set of tests, we investigate the role played by accounting data in determining the percentage of a syndicated loan deal retained by the lead arranger and the concentration of holdings within the syndicate as a whole. We document that, as hypothesized, the percentage retained by the lead arranger (and syndicate concentration) is a decreasing function of the debt-contracting value of accounting data after controlling for a wide range of important variables (including the existence of a credit rating) shown in the previous literature to impact syndicate holdings. We also document that the negative relation between the percentage retained by the lead arranger and debt-contracting value is larger when the borrower is not rated, consistent with a substitute relation between arms length monitoring via accounting data and the credit ratings process. Finally, we find that the negative relation between the percentage retained by the lead arranger and debt-contracting value is larger when the lead arranger in the current deal was not a lead arranger in a previous deal with the same borrower. Following Sufi (2006), our interpretation of this result is that a first time lead arranger for a particular borrower must exert relatively more effort to monitor that borrower than a repeat lead, and thus must hold a relatively larger stake in the loan for incentive purposes.

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[6] Extant research documents significant bond and stock price reactions to credit rating changes (e.g., Holthausen and Leftwich, 1986; Ederington and Goh, 1993, 1998). That rating agencies have access to private information is supported by Jorion et al. (2005). They document that the stock price reaction to credit ratings changes increased significantly after Regulation FD (rating agencies are exempted from the requirements of Regulation FD).

[7] Important contributions include Dennis and Mullineaux (2000), Lee and Mullineaux (2004), Jones et al. (2005), François and Missonier-Piera (2005), and Sufi (2006).

Our second set of tests focuses on the direct contracting role of accounting information in debt contracts. We examine how the debt-contracting value of accounting data influences the choice between a credit rating and an accounting ratio in performance pricing provisions attached to syndicated loan contracts. Performance pricing provisions index the interest rate charged on the syndicated loan to changes in a contractually chosen measure of borrower performance. These provisions are generally indexed by a single performance measure, and are typically distinguished by whether the single performance measure selected is the borrower's current credit rating or an accounting-based financial ratio.[8] We argue that the optimal performance measure choice in performance pricing involves a trade-off between the *informativeness* of a performance measure with respect to the credit quality of the borrower and its *timeliness* (see also Doyle (2003)). All else equal, a lender would prefer to use the performance measure that is most informative about the underlying credit quality of the borrower. However, the timeliness of a performance measure is also clearly important.[9] Thus, the constraint to one measure implicit in performance pricing creates a tension between timeliness and informativeness, necessitating a trade-off. We hypothesize and document that, conditional on choosing to include a single performance pricing provision, syndicates are more likely to choose the timeliness inherent in an accounting ratio over the superior informativeness

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[8] Asquith et al. (2005) posit that such performance pricing provisions are used by banks to mitigate both moral hazard and adverse selection between banks and borrowers. That performance pricing provisions serve a delegated monitoring role that substitutes for lead arranger monitoring is supported by Ivashina (2005) and Panyagometh and Roberts (2002) who document that the percentage retained by the lead arranger is lower when the loan contains a performance pricing provision.

[9] It is interesting to contrast our study with the compensation literature that studies the choice of performance measures. There, the contract trades off sensitivity (how sensitive a measure is to managerial actions) and precision (measurement error relative to inferring managerial actions). In compensation contracts, multiple measures can be used, and an important issue is how to weight the measures in the contract. The constraint to one measure in performance pricing creates a tension between the timeliness of a measure and its informativeness *relative* to the credit quality of the firm (not relative to the actions of the managers).

of credit ratings as the debt-contracting value of a firm's accounting information increases, after controlling for an extensive set of variables.

The paper is organized as follows. Section 2 presents a short institutional background on the syndicated loan market and the syndication process. Section 3 elaborates on the conceptual framework underlying our hypotheses and the relation of our analysis to the existing literature. Section 4 describes details of our estimation of the debt-contracting value of accounting information, while Section 5 presents the empirical analysis of the syndicated loan structure. We present the analysis on the choice of performance measures in performance pricing provisions and the related results in Section 6. Section 7 concludes the paper.

2. SYNDICATED LOAN MARKET

Syndicated lending is a significant source of corporate financing and has recently generated more underwriting revenue than either the equity or the bond market (Altunbas et al., 2006). Syndicated loans are loans provided to a borrower by two or more banks. Every syndicate member has a separate claim on the borrower (not necessarily in equal amounts) although the syndicated loans are governed by a single loan agreement. Syndicated loans are usually structured in packages (or deals) of multiple facilities with different maturities and repayment schedules.

Syndication helps lenders to avoid capital requirement constraints imposed by regulators (Simons, 1993) as well as limit excessive exposure to individual borrowers. Members of the syndicate can be either senior syndicate bank members (such as lead arrangers, lead managers, and agents) or junior bank participants.[10] The senior banks (hereafter "lead arranger") gather

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[10] We classify senior syndicate members as the banks that receive the following descriptions in the Dealscan database: "lead bank", "lead manager", "lead agent", "lead arranger", "agent", "arranger", "book runner".

information about the borrower, search for junior bank participants and coordinate all negotiations. Once the syndicated loan deal is executed, they are responsible for monitoring the compliance of the borrower with the contractual terms and the quality of the collateral if the syndicated loan deal is secured and typically act as administrative agents on behalf of the junior bank participants (i.e., collect payments, re-negotiate the contract, etc). Senior banks usually have strong lending relations with the borrowers and receive significant upfront fees in exchange for arranging the syndication deal and taking the underwriting risk. Junior banks typically earn only the interest rate margin, usually do not have origination capability, and are typically interested in generating future business from the borrower such as treasury management or advisory work (Altunbas et al., 2006)

In this paper, we investigate syndicated loan agreements at the origination date (i.e., the primary market) as provided by the Loan Pricing Corporation through the Dealscan Database. The database captures a significant proportion of the syndicated arrangements both in the US and abroad and provides detailed information on the terms of these debt contracts. The terms usually include a set of non-price terms such as loan maturity, loan size, collateral requirements and covenant restrictions as well as a set of price terms such as interest rates and fees. In the syndicated loan market, interest rates are expressed as a spread quoted in basis points over a floating benchmark which can be LIBOR or another risk-free rate equivalent (e.g. prime rates or T-bills). These variable interest rates are reset every one, two, three or six months to reflect changes in the benchmark rate.

More recently, the pricing of syndicated loans has become more flexible by adding performance pricing features which represent a significant shift from the more established use of financial covenants. In contracts that include only financial covenants, the lenders can increase

the interest rates only when financial performance deteriorates such that a covenant violation occurs (Smith and Warner, 1979; Dichev and Skinner, 2002). If, however, the financial performance improves over the life of the loan, financial covenants do not trigger lower interest rates. This asymmetric response of interest rates to borrower performance is mitigated by performance pricing provisions in the contract. Asquith et al. (2005) document the role of an important feature of these provisions, the choice of interest-increasing or interest-decreasing pricing grids, in resolving adverse selection and moral hazard problems.[11]

Performance pricing features tie loan interest rates to financial ratios or credit ratings. Changes in financial ratios or credit ratings automatically adjust the interest rates according to a specific pricing grid agreed upon at the time when the syndicated loans are negotiated. For this reason, performance pricing features can decrease ex post contracting costs. On the one hand, lenders benefit from timely protection against sudden drops in the credit quality of the borrower and avoid costly and lengthy debt contract renegotiations. On the other hand, borrowers are rewarded in a timely manner for improvements in their credit quality without the need to incur additional refinancing costs.

3. CONCEPTUAL FRAMEWORK AND RELATED LITERATURE

The framework underlying our empirical tests is rooted in principal-agent models such as Holmström (1979). In such models, unobservability of an agent's actions by the principal leads to a demand for monitoring. In Holmström (1979), monitoring is manifested by writing enforceable contracts based on verifiable performance measures. The monitoring value of a

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[11] Interest-increasing pricing allows the lender to automatically increase the interest rate over the life of the loan if the creditworthiness of the borrower declines (initial interest rates are low). Interest-decreasing pricing allows the borrower to pay lower interest rates when its credit quality improves (initial interest rates are high). For more details see Asquith et al. (2005).

performance measure depends on its quality as a signal about the agent's unobservable actions. In a debt contracting setting, Holmström and Tirole (1997) model a moral hazard problem between an informed lender and uninformed lenders. To create incentives for monitoring, a lender charged with monitoring responsibilities must retain a large financial stake in the borrowing firm.[12] The informed lender retains a larger share of the loan as the moral hazard problem increases.

The delegation of monitoring to the lead arranger of a syndicated loan is consistent with insights in Diamond (1984). Given the multi-lender structure of loan syndications, delegation of monitoring responsibility can mitigate costly duplication of monitoring efforts and potential free-riding problems. At the same time, delegation of monitoring leads to incentive problems due to the inability of syndicate participants to directly observe the monitoring activities of the lead arranger, and so the lead arranger retains a share of the loan. However, this is potentially costly as increased exposure to a single borrower restricts diversification of the lead arranger's loan portfolio.[13] We argue that when the debt-contracting value of accounting information is high, accounting information can serve as a substitute delegated monitoring mechanism, allowing the lead arranger to hold a smaller proportion of the loan and economize on diversification costs.

Several papers empirically examine the hypothesis that the percentage of a loan held by the lead arranger increases as information asymmetry increases. Dennis and Mullineaux (2000), Jones et al. (2005) and Sufi (2006) proxy for the degree of information asymmetry by whether the borrower is a publicly traded or private company, and by whether the borrower is rated by a

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[12] Possession of private, pre-contracting information can also result in the lead lender holding a substantial stake in the loan as in Leland and Pyle (1977).

[13] Ivashina (2006) empirically analyzes the trade-off between moral hazard problems and diversification in determining the optimal proportion of the loan retained.

reputable ratings agency. This literature documents that the percentage of a syndicated loan retained by the lead arranger is lower for publicly traded and rated borrowers relative to privately held, unrated borrowers.

We extend this literature by conceptualizing accounting information as a monitoring device in its own right that can potentially substitute for costly, direct monitoring by the lead arranger. While most of the prior literature in this area compares transparent firms (public, rated firms) against opaque firms (private, unrated firms), we argue that even within the set of publicly traded firms, the value of accounting information as a monitor of credit quality can vary substantially across borrowers and generate cross-sectional differences in its impact on the structure of loan syndicates.

Our main analysis is most closely related to Sufi (2006) who investigates how variation in transparency across publicly traded firms impacts the loan percentage retained by lead arrangers. Sufi (2006) documents that for publicly traded firms, the percentage of the loan held by lead arrangers is higher when the firm does not have a credit rating. We extend this work in several important ways. Conceptually, Sufi (2006) views the issue as involving opaqueness versus transparency, where we view it in terms of choosing the optimal mix of delegated monitoring mechanisms. This represents an important difference. By conceptualizing accounting data as a monitor in its own right, we are able to investigate ratings and accounting data as separate mechanisms, allowing us to gain deeper insights into syndicated loan ownership structures.

In particular, we expect that even after controlling for whether or not a public firm has a credit rating, the percentage retained by lead arrangers should be negatively related to the debt-contracting value of accounting data. In addition, we hypothesize that the extent of the negative relation between the percentage retained and the debt-contracting value of accounting depends

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on whether the borrower has a credit ratings or not. In essence, the negative relation should be larger when the firm is not rated, consistent with arms length monitoring via accounting data being more important in the absence of delegated monitoring by a credit agency.

To extend this point further, we predict an additional effect by exploiting another aspect of Sufi (2006). Sufi (2006) constructs a variable that measures whether the lead arranger of a given syndicated deal has served as a lead arranger for the same borrower on a previous syndicated loan. Under a moral hazard interpretation, a lead arranger with a previous lending relationship has already expended significant effort to learn about the borrower, and thus requires fewer incentives to exert monitoring effort. Sufi (2006) documents that lead arrangers with previous lending relationships hold a smaller percentage of the loan.[14] We take this logic one step further in our analysis. If a previous lending relationship reduces the moral hazard problem, then ceteris paribus, we predict that the negative relation between the percentage retained and the debt-contracting value of accounting will be lower, consistent with a reduced demand for arms length monitoring via accounting data.

In addition to having predictions on the percentage of a loan retained by the lead arranger, we expect that cross-sectional variation in the debt-contracting value of accounting influences the concentration of loan holdings within the syndicate. If we view syndicated loans as lying somewhere on a continuum between single lender loans and diffusely held public bonds, the concentration of loan holdings can be considered a proxy for the location of a given syndicate structure along the continuum. Lee and Mullineaux (2004) and Sufi (2006) conjecture that the concentration of loan holdings within the syndicate captures the demand for joint monitoring

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[14] We replicate this result with our sample of loan deals. Sufi (2006) uses this variable in an attempt to distinguish adverse selection from moral hazard as the main driver of syndicate structure. If the existence of a previous lending relationship instead measured the private information advantage of the lead arranger, we would expect to see the percentage retained by the lead to be *higher* when a previous lending arrangement exists.

activities by multiple members of the syndicate.[15] In our tests of lead arrangers' retained

percentages and the concentration of syndicate holdings, we control for the explicit use of

accounting information in the debt contract itself. In particular, we control for the existence of

loan covenants based on financial performance measures and for the use of performance

provisions.

We use the presence of the performance pricing provisions to provide additional support

for the predictions on the syndicate ownership structure. More specifically, we examine the

direct contractual role of accounting by focusing on a subset of publicly traded firms that include

a performance pricing provision in the loan contract. Ivashina (2005) and Panyagometh and

Roberts (2002) demonstrate a delegated monitoring role for performance pricing provisions by

documenting that the percentage retained by the lead arranger is lower when the loan contains a

performance pricing provision. We extend this research by investigating when the delegated

monitoring role of performance pricing is manifested through the use of accounting information

versus a credit rating.

We argue that the optimal performance measure choice in performance pricing involves a

trade-off between the informativeness of a performance measure with respect to the credit

quality of the borrower and its timeliness (see also Doyle, 2003). All else equal, a lender would

prefer to use the performance measure that is most informative about the underlying credit

quality of the borrower. However, the timeliness of a performance measure is also clearly

important. Thus, the constraint to one measure implicit in performance pricing creates a tension

between timeliness and informativeness, necessitating a trade-off. While it is likely that credit

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[15] The number of syndicate members and the allocation of holdings across members can be influenced by
considerations beyond joint monitoring. Bolton and Scharfstein (1996) and Hart (1995), among others, explore
issues related to the number of creditors, and the distribution of holdings and collateral across creditors as it relates
to potential negotiations in the event of borrower default.

ratings are more informative about credit quality of the borrower than any single accounting ratio, the credit ratings process by its very nature must sacrifice a certain degree of timeliness. Before issuing a rating change, analysts from the rating agency meet with the management of the borrower several times while writing comprehensive assessment reports. This due diligence process certainly takes time. Once a rating decision is made, the companies are informed and given a chance to respond before the rating is publicly announced. We hypothesize that, conditional on choosing to include a performance pricing provision, syndicates are more likely to choose an accounting ratio over credit ratings as the debt-contracting value of a firm's accounting information increases.

4. DEBT-CONTRACTING VALUE OF ACCOUNTING INFORMATION

There is little consensus in the accounting literature on which specific, measurable properties of accounting information enhance its value in debt contracting. There are many such properties that could be considered. For example, some argue that conservative accounting numbers enhance the debt-contracting value of accounting (e.g., Ball, 2001; Watts, 2003a), while others argue to the contrary (e.g. Guay and Verrecchia, 2006; Schipper, 2005). But even accepting the importance of conservatism for debt contracting, many different measures are used in the literature to proxy for the general construct of accounting conservatism (see e.g., Beatty et al., 2006). Beyond conservatism, the literature considers many other attributes of accounting information often falling under the rubric of "earnings quality" (see e.g., Francis et al., 2004). In an attempt to parsimoniously deal with the multiplicity of attributes, we exploit observable changes in credit quality to create a direct proxy for the debt-contracting value of accounting.

Our primary measure of debt-contracting value, *DCV*, is generated by estimating a model of credit ratings downgrades as a function of lagged seasonally-adjusted accounting earnings.

This variable measures the extent to which reported earnings as a stand-alone measure captures timely information concerning changes in credit quality. Specifically, *DCV* is measured as the goodness-of-fit from the following Probit regression:

$$P(Downgrade_t = 1) = \alpha_1 + \alpha_2 \Delta E_{t-1} + \alpha_3 \Delta E_{t-2} + \alpha_4 \Delta E_{t-3} + \alpha_5 \Delta E_{t-4} + \varepsilon_t, \qquad (1)$$

where *Downgrade* is an indicator variable that takes the value 1 if the firm's credit rating is downgraded in the current quarter and 0 otherwise, and ΔE_{t-k} is the seasonally adjusted change in earnings before extraordinary items scaled by total assets in the kth quarter prior to the current quarter *t*. We estimate the Probit regressions at the two-digit industry level (in our sample we identify 63 two-digit SIC codes). This approach increases the power of the estimation given a limited number of rating downgrades. We extract the ratings downgrade data from the Moody's Investors Service historical database over the period 1985-2004. We set *DCV* equal to Somers' D, which measures the goodness-of-fit in a Probit regression.[16] This measure captures the ability of quarterly earnings innovations to predict deterioration in a firm's credit quality in a timely manner.

For completeness, we also consider two other prominent properties of accounting information in our main tests. First, we estimate *TIMELINESS* as the extent to which current earnings capture the information set underlying contemporaneous changes in stock price. *TIMELINESS* is the R^2 from the following regression of stock returns on earnings and change in earnings (a similar design is implemented by Bushman et al., 2004):

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[16] Somers' D is a statistic of association between observed downgrades and model predicted downgrade probabilities and is computed as: $(n_c-n_d)/t$, where *t* is the total number of paired observations with different responses in the sample (i.e., one observation is a downgrade, one is not), n_c is the number of concordant pairs and n_d is the number of discordant pairs. A pair of observations is said to be concordant (discordant) if the observation with a downgrade event has a larger predicted event probability than the paired observation which is not a downgrade (for detailed explanations see Somers, 1962). We note that the choice of the goodness-of-fit measure is not crucial since all measures are highly correlated.

$$R_t = \alpha_0 + \alpha_1 E_t + \alpha_2 \Delta E_t + \varepsilon_t, \qquad\qquad (2)$$

where R_t is the 4-month market-adjusted stock return ending one month after the end of the

fiscal quarter, E_t is quarterly earnings before extraordinary items scaled by average total assets

and ΔE_t is seasonally adjusted quarterly earnings before extraordinary items scaled by average

total assets. As with Eq. (1), we estimate Eq. (2) at the two-digit industry level and over the

period 1985-2004.

Second, we estimate a measure of timely loss recognition, TLR, to capture the asymmetric

recognition of losses in earnings. Following Basu (1997), TLR is estimated as the coefficient on

the interaction variable, α_3, computed from the following regression:

$$E_t = \alpha_0 + \alpha_1 Neg_t + \alpha_2 R_t + \alpha_3 \left(R_t \cdot Neg_t \right) + \varepsilon_t \qquad\qquad (3)$$

where E_t is quarterly earnings before extraordinary items scaled by average total assets, R_t is

quarterly market-adjusted returns and Neg_t is an indicator variable that takes the value 1 if the

market-adjusted returns are negative and 0 otherwise. Again, we estimate Eq. (3) at the two-digit

industry level and over the period 1985-2004. TLR is expected to be positive and increasing as

firms in the industry implement more conservative accounting choices.

In unreported analyses, we also use an asymmetric timeliness measure based on a model

implemented by Ball and Shivakumar (2005) and obtain quantitatively similar results.[17] We also

use industry specific averages of standardized non-operating accruals (similar to Givoly and

Hayn, 2000) and special items as alternative accrual based conservatism measures.[18] Our results

are robust to these measures.

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[17] We run regressions of accrual levels on cash flows from operations and an indicator variable that takes the value 1 if the cash flows are negative. Similarly, the asymmetric timeliness measure is the coefficient of the interaction variable.

[18] Non-operating accruals are computed as the difference between total accruals and operating accruals (see Givoly and Hayn, 2000 for more details).

5. EMPIRICAL ANALYSIS OF SYNDICATED LOAN STRUCTURE

In this section we present our empirical analysis of how the debt-contracting value of accounting information influences the optimal mix of delegated monitoring mechanisms in syndicated loan deals of publicly traded borrowers. Section 5.1 lays out the empirical design. Section 5.2 discusses our sample selection and descriptive statistics, while section 5.3 presents the main results of our analysis

5.1. Empirical Design

In our first analysis, we investigate the trade-off between the monitoring role of the syndication structure in loan contracts and accounting information with greater debt-contracting value.

We look at the composition of the syndicate structure to measure monitoring incentives. First, we compute the fraction of the entire deal retained by the lead arrangers in the syndicate, *LEAD_OWN*. Lead arrangers that hold larger fractions of the deals have greater incentives to monitor loans given their larger credit risk exposure. If there is more than one lead arranger, we follow Sufi (2006) and compute the average share retained. Second, we compute a Herfindahl Index based on the holdings of all syndicate members (arrangers and participants) in the deal, *LENDER_HERF*. This index equals the sum of squared percentage ownership of individual syndicate members. We conjecture that the concentration of loan holdings within the syndicate captures the demand for joint monitoring activities by multiple members of the syndicate. That is, relative to the first measure, *LEAD_OWN*, this measure also captures the monitoring incentives of member participants with large shares in the loan deal. We estimate OLS regression models that relate each of the two syndicate structure measures to the debt-contracting value of accounting information proxies as well as an extensive set of borrower-specific and deal-specific

control variables:

$$LEAD\_OWN \left(LENDER\_HERF \right) = \alpha_0 + \alpha_1 \, ACCTG_t + \sum_{i=2}^{I} \alpha_i \, Controls_{i,t} + \varepsilon_t \qquad (4)$$

where *ACCTG* is one of three debt-contracting value of accounting information measures described in the prior section. Our specification includes a number of key deal-specific and borrower-specific control variables.

Two attributes in particular play a central role in our empirical design: whether a borrower or the loan is rated, and whether the lead arranger has served as a lead arranger on a previous loan for the borrower. *UNRATED* is an indicator variable that takes the value 1 if the firm or the loan is not rated (we search both Dealscan and Moody's Investor Service for ratings availability). We view credit rating agencies as an alternative delegated monitoring mechanism. Sufi (2006) argues that unrated firms are opaque and finds that lead arrangers are required to hold more in the syndicated loan deal. *NO_LEAD_PRIOR* is an indicator variable equal to 1 if the current lead arranger was not a lead arranger for the same borrower in a previous deal. The idea is that lead banks with no previous loan deals with the current borrower have to invest significant effort to monitor and learn about the borrower and thus must hold more of the loan deal. Sufi (2006) documents that this variable is an important determinant of the syndicate structure.

We consider a number of other deal-specific variables (a description of all variables is included in the appendix). If a deal has multiple loans, we select the characteristics of the largest loan as deal level control variables. We use *DEAL_SIZE*, defined as the logarithm of the total dollar value of each deal, is used to proxy for the overall syndicate risk exposure. Larger loan deals are expected to be financed by a larger number of syndicate members (due to capital requirements constraints or to limit risk exposure to one borrower) and so will exhibit a more diffused syndicate ownership and lead arrangers will retain smaller percentages of the loan deals.

LOAN_SPREAD is the All-In-Spread Drawn (in basis points over LIBOR) from Dealscan. Dealscan defines the All-In-Spread Drawn as the total annual spread paid for each dollar drawn down under the loan commitment (including fees). *LOAN_MATURITY* is the number of years to loan maturity. *SECURED* is an indicator variable that flags loans which are secured with collateral. *REVOLVER* is an indicator variable equal to 1 if the loan is revolving and 0 otherwise.

We control for the number of general covenants (*GEN_COVENANTS*), the number of financial covenants (*FIN_COVENANTS*), and for the choice of performance pricing provisions (*PP_INDICATOR* = 1 if the loan contract has a performance pricing provision, 0 otherwise) written in the loan contract to control for their ex-post monitoring roles.[19] We also include the number of previous loans taken by the borrower, *LOG_PREVIOUS*, computed as the logarithm of one plus the number of previous loans, to proxy for the reputation of the borrower in accessing the syndicated loan market. We further control for fixed year effects to capture structural changes in the syndicated loan market liquidity over time.

We also include several key borrower-specific variables. *PROFITABILITY* is defined as the borrower's operating income scaled by average total assets at the time of the deal. *INTEREST_COVERAGE* is defined as the sum of earnings before extraordinary items and interest expense scaled by interest expense. *FIRM_SIZE* is defined as the logarithm of the borrower's book value of total assets. We expect more diffused ownership and lead arrangers to hold a relatively smaller share of the deal when the borrowing firm is larger. Large firms tend to have better public information environments that can potentially mitigate the information

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[19] Financial and General Covenants available in Dealscan are presented in Vasvari (2006). Financial covenants are promises not to allow certain balance sheet or income statement items or ratios to fall below (or above) an agreed upon level (e.g., Net Worth, Current Ratio, Interest Coverage, Debt to Equity). General Covenants are standard assurances and undertakings that the syndicate obtains from the borrower (e.g., loan must be repaid out of excess cash flows, debt, asset sales, equity issues or insurance proceeds (sweeps), restrictions on dividend payments, etc).

asymmetry between informed lenders (lead arrangers) and uninformed lenders (syndicated participants). Finally, *LEVERAGE* is the sum of the borrower's debt in current liabilities and total long-term debt scaled by total assets.

5.2. Sample Selection and Descriptive Statistics

We collect our sample from Dealscan (provided by the Loan Pricing Corporation) which contains data on syndicated loan agreements at the time of their origination. The syndicated loan data is gathered from SEC fillings (13Ds, 14Ds, 13Es, 10ks, and 8ks) or through Loan Pricing Corporation's relationships with major banks active in the syndicated loan market. The loans (or facilities) are grouped in deals when borrowing firms enter into multiple agreements at the same time. We perform our analysis at the deal level as opposed to the loan level because syndicated loan contracts are drafted at the deal level and all lenders are chosen on deal tranches collectively not independently (Sufi, 2006).

We require several filters to reach the final loan sample for the syndicate ownership analysis (see Table 1, Panel A). First, we select all loans that we can manually match to the Compustat database for US firms from 1992 to 2004. To ensure accuracy in our matching procedure, we match borrowers not only on their names but also on their industry membership and geographical location. This initial constraint generates a sample of 33,375 (24,441) loans (deals) from 6,243 firms. Second, we limit our sample to non financial companies and require data availability on the various firm and loan specific variables discussed above further decreasing the sample to 17,819 (12,483) loans (deals) from 4,002 firms. Third, we require data availability on percentage holdings of each syndicate member to compute *LEAD_OWN* and *LENDER_HERF*. Finally, we remove from our sample all sole lender deals to identify a clean sample of syndicated loans. After this final step, we have 4,140 deals from 1,915 borrowing

firms left in our sample.

In Table 1, Panel B presents descriptive statistics. The mean *LEAD_OWN* (*LENDER_HERF*) is 0.25 (0.21) which are comparable with the characteristics reported in Sufi (2006). *DCV* has a mean of 0.356 and a median of 0.339 and exhibits considerable variation across industries. *TLR* computed at the industry level is positive across all quartiles suggesting that the accounting choices implemented by borrowers are on average conservative.

The average syndicated deal size is about $450 million. The largest loan in the average deal has a maturity of approximately three and a half years and a spread of 141 basis points above a benchmark risk-free rate. In our sample, 40% of the loans are secured and 84% are revolving. On average, the deals have about two (one) general (financial) covenants attached. Performance pricing provisions are included in 61% of the deals. The average borrower has around 6 syndicated loans prior to this deal and is relatively large with $4.2 billion in total assets, consistent with other studies that use Dealscan data. The average firm has return on assets (*PROFITABILITY*) of about 3.0% and LEVERAGE of 34%.

Table 1, Panel C presents Pearson Correlation statistics among dependent variables and selected independent variables used in the multivariate tests. Of particular interest is the correlation of 0.408 between *DCV* and *TIMELINESS*, consistent with a high degree of debt and equity markets integration. However, in the next section, multivariate tests show that *DCV* captures a more significant portion of the variation in our dependent variables than *TIMELINESS*. Finally, we note that *TLR* is significantly positively correlated with *DCV*.

5.3. Results

Table 2 presents the results of our lead ownership analysis where *LEAD_OWN* is the dependent variable (the untabulated results for *LENDER_HERF* are qualitatively similar). We

compute significance levels using standard errors adjusted for clustering at the firm level to deal with multiple deals for the same borrower. Consistent with our first hypothesis, we find a significant, negative association between *LEAD_OWN* and *DCV* (column 1). This suggests that as the debt-contracting value of the accounting information improves, the increased efficacy of arms length monitoring based on accounting information reduces the demand for large lead ownership. The availability of better public accounting information shifts syndicate structure away from relationship lending and closer to the public debt end of the continuum. We also find that, consistent with the results in Sufi (2006), *LEAD_OWN* is higher for unrated firms (*UNRATED*) and where the lead arranger has not previously arranged a loan for the borrower (*NO_LEAD_PRIOR*). Sufi (2006) interprets the positive coefficient on *NO_LEAD_PRIOR* as consistent with a moral hazard story where lead arrangers who have not previously arranged loans for a borrower must be given stronger incentives to exert the effort necessary to monitor an unfamiliar borrower. Also, *DEAL_SIZE*, *MATURITY*, and *SECURED* have the expected sign and are significant at conventional levels, and both covenant proxies load significantly and negatively. Firm specific controls such as *PROFITABILITY* and *SIZE* also have the expected sign.

In column 2, we find that the coefficient of *TIMELINESS* is negative and marginally significant at 10%. However, in column 3 where both *DCV* and *TIMELINESS* are included, *TIMELINESS* is no longer significant. Finally, in column 4, we introduce all three information variables and find that *DCV* and *TLR* are negative and significant suggesting that each captures different dimensions of the debt-contracting value construct we try to measure.

In Tables 3 and 4 we examine our second hypothesis. We hypothesize that the extent of the relation between *LEAD_OWN* (*LENDER_HERF*) and *DCV* will be more negative when the

borrower does not have a credit rating, consistent with arms length monitoring via accounting data being more important in the absence of delegated monitoring by a credit agency. Further, we hypothesize that a lead arranger with a previous lending relationship has already expended significant effort to learn about the borrower, and will require less incentives to exert monitoring effort. Thus, we predict that the relation between *LEAD_OWN* (*LENDER_HERF*) and *DCV* will be more negative when the lead arranger has not previously arranged loans for a borrower. We add interaction terms *DCV* UNRATED* and *DCV* NO_LEAD_PRIOR*, and predict that the coefficient on each interaction term will be negative.

Table 3, where *LEAD_OWN* is the dependent variable, and table 4, where *LENDER_HERF* is the dependent variable, present evidence consistent with our hypotheses. In both tables, the coefficients on the interaction terms *DCV* UNRATED* and *DCV* NO_LEAD_PRIOR* are both negative and significant at the 1% level. In column 3 of tables 3 and 4, we also include *TLR* and the interaction terms *TLR* UNRATED* and *TLR* NO_LEAD_PRIOR*. We find that the coefficient on *TLR* UNRATED* is negative and significant in both the tables 3 and 4, while the coefficient on *TLR* NO_LEAD_PRIOR* is positive and insignificant in both tables.

6. EMPIRICAL ANALYSIS OF PERFORMANCE PRICING PROVISIONS

6.1. Empirical Analysis

Our second analysis investigates the choice of performance measure included in performance pricing provisions. We estimate the following Probit model:

$$P\left(Ratio\_PP_t = 1\right) = \alpha_0 + \alpha_1 \ ACCTG_t + \sum_{j=3}^{J} \alpha_j \ Controls_{j,t} + \varepsilon_t \ , \qquad (5)$$

where *ACCTG* is one of the three debt-contracting value of accounting information measures

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described previously. We include the same borrower-specific and loan-specific control variables used in the syndicate structure analysis. Since Eq. (5) is estimated at the loan level (as opposed to the deal level), we also include *LOAN_SIZE* defined as the logarithm of the dollar amount of the loan facility. We further include a control for ratings. *RATING_GROUP* is the loan specific rating (or borrower rating if the loan rating is missing). We transform the letter group ratings available in Dealscan into numbers such that investment grade loan ratings (AAA to BBB ratings) are assigned a value from 1 to 4 while speculative grade loan ratings (BB to C ratings) are assigned larger values from 5 to 9. Finally, we introduce an *INCREASING_PP* (*DECREASING_PP*) indicator variable which is equal to 1 if the loan contract contains an interest increasing (decreasing) performance pricing provision to control for moral hazard (adverse selection) costs in the choice of performance measures (see discussion in Asquith et al., 2005). If the loan spread at the contract date is equal to the lowest spread in the pricing grid specified in the performance pricing provision, then the loan is considered to have an interest increasing performance pricing provision. Similarly, if the loan spread at the contract date is equal to the highest spread in the pricing grid then the loan is considered to have an interest decreasing performance pricing provision. If the loan spread at the contract date is neither equal to the highest spread nor equal to the lowest spread in the pricing grid then the loan is considered to have both interest decreasing and increasing performance pricing provisions.

6.2. Sample selection and Descriptive Statistics

We apply different filters to reach our final performance pricing loan sample (see Table 5, Panel A). After matching the Dealscan data with Compustat, excluding financial firms and requiring data availability for our control variables, the sample size is 17,819 (12,483) loans (deals) from 4,002 firms. We then select all loans with performance pricing features. This

additional constraint limits the sample to 7,194 (5,044) loans (deals) from 2,273 firms. We further require data availability on credit ratings to eliminate the possibility that performance pricing is based on accounting ratios simply because rating agencies do not rate the firm or the loan.[20] The final sample comprises 4,203 (2,928) loans (deals) from 1,232 firms. Approximately 55% of the loans have performance pricing provisions based on accounting measures.

In Table 5, Panel B we present descriptive statistics on the measures used in performance pricing provisions. The most commonly used accounting measure is Debt-to-EBITDA, consistent with Asquith et al. (2005). This ratio is present in 40.5% of the performance pricing provisions selected in our sample. Other accounting measures in our sample include Leverage (3.3%), Fixed Charge Coverage (2.1%), Senior Debt to EBITDA (2.0%), Interest Coverage (2.5%), Debt to Tangible Net Worth (1.0%), Debt Service Coverage (0.3%) and Senior Leverage (0.2%). A small proportion of the performance pricing contracts (3.3%) are based on tailored accounting measures (e.g., include guarantees, contingent liabilities and/or off balance sheet leases in the computation of debt) which are negotiated by the bank syndicate.

In our sample, we find only two types of ratings in performance pricing contracts: senior debt ratings (44.4% in total number of provisions) and commercial paper ratings (only 0.4% in total number of provisions). The heavy use of senior debt ratings is consistent with the fact that most of the syndicated loans are negotiated as the most senior form of debt. Only a very small percentage of loans have performance pricing provisions based on more than one accounting measure or ratings type. Consistent with Asquith et al. (2005) who find that 92% of their performance pricing contracts are interest-decreasing, we also find that 89% of our contracts are interest-decreasing (see Table 5, Panel C). We also find that interest-increasing contracts are

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[20] If loan ratings are missing, we use Moody's Historical Ratings Database to retrieve the issuer rating at the time of the loan. Issuer ratings are generally very close to loan ratings given that loans are the most senior form of debt.

more likely to be based on Senior Debt Ratings than on Debt-to-EBITDA or any other accounting ratio (unreported).

Table 5, Panel C presents similar descriptive statistics on the performance pricing sample as for our syndicate ownership sample. There are no significant differences across the two samples in terms of the measures for the debt-contracting value of accounting information or firm specific characteristics. However, we note that the deal size is larger on average ($776 million as opposed to $458 million in the syndicated ownership sample). Also the loans in the performance pricing sample have more covenants (on average they have about 4 general covenants and 2 financial covenants). This suggests that it is important to control for the presence of covenants in multivariate tests given their inherent monitoring role that seems to complement performance pricing provisions.

We delete 122 loans (from 58 firms) from our sample that have both accounting and rating based performance pricing contracts. We have manually investigated each of these loans by examining the borrowers' 10-Ks. We found that in most cases the performance pricing was primarily based on ratings. However, the contracts specified that when ratings are not available, the performance pricing will be based on an accounting measure.[21] We also delete loans with performance pricing based on other conditions such as interest rates based on the age of the loan or on the percentage of the loan amount drawn down unless the contract specifies an additional pricing grid based on either an accounting measure or a rating.[22]

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[21] For example, Pentair's Inc 10-K discloses the following: "On Sept. 2, 1999, the Company entered into two new revolving credit facilities aggregating $800 million; a new five-year $425 million revolving credit facility and a new 364-day $375 million revolving credit facility. Inclusive of related facilities fees, the New Revolving Credit Facilities accrue interest at a floating rate based upon the rating of the Company's long term senior unsecured debt assigned by S&P and Moody's, or if no rating is available, based on a leverage ratio".

[22] The proportion with provisions based on these other conditions is less than 1% of the total number of contracts.

6.3. Results

Table 6, column 1 documents that the coefficient on *DCV* is positive and significant, consistent with our prediction that as the debt-contracting value of accounting information increases, lenders rely more on accounting-based monitoring as opposed to rating-based monitoring. In other words, the timeliness provided by the accounting information is more important than the informativeness provided by credit ratings. This result is robust to an extensive set of firm-specific and loan-specific control variables. Similar to prior specifications, the significance of all Probit coefficient estimates in Table 6 are computed based on standard errors clustered at the firm level.

Column 2 examines the effect of *TIMELINESS* on the lenders' optimal choice of performance measures in the performance pricing provision. Similarly to the prior analysis in Table 2, we find that *TIMELINESS* is marginally and positively significant. When we introduce *DCV* and *TIMELINESS* in the regression, we find that *DCV* drives out the significance of *TIMELINESS*. In column 4, we document that both *TLR* and *DCV* are significant and positive.[23]

We also examine (unreported) the association between accounting conservatism and the choice of accounting based performance pricing provisions. We estimate pooled Basu (1997) and Ball and Shivakumar (2005) regressions with an additional interaction variable with an indicator variable that identifies firms with performance pricing contracts that use accounting ratios (Beatty et al., 2006 follow a similar approach). This analysis allows us to reduce measurement errors associated with the estimation of the asymmetric timeliness measure, while the cost is that we do not control for other loan contract specific variables that are associated with the performance measure choice. The results suggest that firms with performance pricing

based on accounting measures are more conservative in the years leading up to the loan date than the firms with provisions using credit ratings. The coefficients of the interaction between negative returns and the presence of accounting based performance pricing (Basu, 1997 model) and the interaction between negative cash flows and the presence of accounting based performance pricing (Ball and Shivakumar, 2005 model) are significantly positive.

7. CONCLUSIONS

In this paper, we empirically investigate how the debt-contracting value of accounting information influences the optimal mix of delegated monitoring mechanisms in syndicated loan deals of publicly traded borrowers. We explore economic relations between three alternative monitoring mechanisms: (1) direct, relationship-based monitoring by the lead arranger of a syndicated deal, (2) arms length monitoring via publicly available accounting information, and (3) credit ratings produced by independent rating agencies.

We hypothesize that as the ability of publicly reported accounting numbers to capture changes in credit quality in a timely fashion increases (i.e., debt-contracting value of accounting increases), arms length monitoring based on accounting information will be increasingly substituted for direct, relationship-based monitoring by the lead arranger of a syndicated deal. Further, we also hypothesize that accounting information with high debt-contracting value is relatively more important as a substitute mechanism for relationship-based monitoring when the borrower is not rated by a credit agency and when *ex post* monitoring by the lead arranger will require relatively more effort.

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[23] We repeat the Probit analysis in Table 6, Column 4 using alternative industry-specific conservatism measures (scaled non-operating accruals and special items; timeliness estimated using the Ball and Shivakumar, 2005 model). Our inferences are not affected.

Our primary measure for the debt-contracting value of accounting is the goodness-of-fit of a model of credit ratings downgrades as a function of lagged seasonally-adjusted accounting earnings (*DCV*). This variable measures the extent to which reported earnings as a stand-alone measure captures timely information concerning changes in credit quality. We also consider other prominent properties of accounting information, including timely loss recognition (*TLR*) along the lines of Basu (1997) and the extent to which current earnings capture the information set underlying contemporaneous changes in stock price using the R^2 from a regression of stock returns on current earnings (*TIMLELINESS*).

We document that the percentage of the loan retained by the lead arranger is a decreasing function of both *DCV* and *TLR*.[24] The fact that the coefficients on *DCV* and *TLR* are negative and significant when both variables are included in the regression implies that *DCV* does not fully capture the debt-contracting value of accounting. However, despite this limitation, *DCV* is an intuitive and parsimonious measure, and serves a useful role in establishing a central role for the inherent properties of accounting information in influencing the design of syndicate structure.

We also document that the negative relations between the percentage retained by the lead arranger and both *DCV* and *TLR* are larger when the borrower is not rated, consistent with a substitute relation between arms length monitoring via accounting data and the credit ratings process. In addition, we find that the negative relation between the percentage retained by the lead arranger and *DCV* is larger when the lead arranger in the current deal was not a lead arranger in a previous deal with the same borrower. Our interpretation of this last result is that a first time lead arranger for a particular borrower must exert relatively more effort to monitor that

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[24] The results using *TIMELINESS* are also consistent with our hypotheses, but the coefficient on this variable is no longer significant when we also include *DCV* and *TLR* in the regression. The results are qualitatively similar when we replace the percentage retained by the lead arranger with the concentration of syndicate holdings as the dependent variable. Both measures are proxies for the importance of relationship monitoring in the syndicate.

borrower than a repeat lead, and thus must hold a relatively larger stake in the loan for incentive purposes.

Finally, we exploit the existence of performance pricing provisions in syndicated loan contracts to investigate how the debt-contracting value of accounting influences the choice of performance measure used in these provisions. We predict and find that for loans that include performance pricing provisions, the likelihood that the single performance measure used in the provision will be an accounting ratio rather than a credit rating increases as the debt-contracting value of accounting information improves. This result holds for both *DCV* and *TLR* (again *TIMELINESS* is not significant when *DCV* or *TLR* are included). The fact that the likelihood that a performance pricing provision will incorporate an accounting measure rather than a credit rating is increasing in *DCV* supports our interpretation that *DCV* captures an important property of accounting information relative to its value in debt contracting.

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Data Appendix

Variable	Description	Data Source
Dependent Variables		
LEAD_OWN	The fraction of the deal owned by the lead arranger.	Dealscan
LENDER_HERF	A syndicate ownership Herfindahl Index defined as the sum of the squared percentage ownership of each lender in the deal syndicate.	Dealscan
PP_RATIO	An indicator variable equal to 1 (equal to 0) if an accounting ratio (credit rating) based performance pricing provision is used in the syndicated loan contract.	Dealscan
Information Variables		
DCV	A credit market based earnings quality measure computed as the Somers' D association statistic obtained from industry specific (2 digit SIC codes) Probit regressions that predict credit rating downgrades. The downgrade predictors are the seasonally adjusted quarterly earnings over the prior 4 quarters.	Moody's/ Compustat
TIMELINESS	An equity market based earnings quality measure computed as the R^2 obtained from industry specific (2 digit SIC codes) pooled regressions of market-adjusted returns on quarterly earnings levels and seasonally differenced quarterly earnings.	CRSP/ Compustat
TLR	The coefficient on negative returns in earnings-returns regressions estimated using quarterly data at the industry level (2 digit SIC codes)	CRSP/ Compustat
Loan-Specific and Deal-Specific Control Variables		
UNRATED	An indicator variable that takes the value 1 if the firm or the loan is not rated.	Dealscan
NO_LEAD_PRIOR	An indicator variable equal to 1 if the current lead arranger was not a lead arranger for the same borrower in a previous deal.	Dealscan
LOAN_SIZE	The logarithm of the total dollar value of each loan.	Dealscan
DEAL_SIZE	The logarithm of the total dollar value of each deal.	Dealscan
LOAN_SPREAD	Logarithm of the total annual all-in-spread drawn (in basis points) paid for each dollar drawn down under the loan commitment (including fees and interest).	Dealscan
LOAN_MATURITY	The number of years to loan maturity.	Dealscan
SECURED	An indicator variable equal to 1 if the loan is secured with collateral.	Dealscan
REVOLVER	An indicator variable equal to 1 if the loan is revolving.	Dealscan
GEN_COVENANTS	The number of general covenants contained in the loan agreement.	Dealscan
FIN_COVENANTS	The number of financial covenants contained in the loan agreement.	Dealscan
PP_INDICATOR	An indicator variable equal to 1 if the loan contains a performance pricing provision.	Dealscan
LOG_PREVIOUS	Logarithm of one plus the number of previous syndicated loans taken by the borrower.	Dealscan
RATING_GROUP	The loan rating (issuer rating if the loan rating is missing) coded from 1 for AAA/Aaa rated loans to 9 for C/C rated loans.	Dealscan/ Moody's
INCREASING_PP	An indicator variable equal to 1 if the loan contains an interest increasing performance pricing provision.	Dealscan
DECREASING_PP	An indicator variable equal to 1 if the loan contains an interest decreasing performance pricing provision.	Dealscan
Borrower-Specific Control Variables		
PROFITABILITY	The sum of the borrower's prior four quarters income before extraordinary items (data8) scaled by average total assets (data44) at the time of the deal.	Compustat
INTEREST_COVERAGE	The borrower's interest expense (data22) plus income before extraordinary items (data8) scaled by interest expense (data22).	Compustat
FIRM_SIZE	The logarithm of the borrower's book value of assets (data44) at the time of the deal.	Compustat
LEVERAGE	The borrower's debt in current liabilities (data45) plus total long-term debt (data51) scaled by book value of total assets (data44).	Compustat

Table 1
Syndicate Ownership Sample Selection, Descriptive Statistics and Correlation Matrix

Panel A: Description of syndicate ownership sample selection procedure.

Syndicate Ownership Sample Selection (Deal Level)	Loans	Deals	Firms
− Sample of syndicated loan contracts matched to Compustat	33,375	24,441	6,243
− Sample after excluding financial firms	29,282	21,061	5,468
− Sample after requiring availability of loan and borrower-specific variables	17,819	12,483	4,002
− Sample after requiring data on percentage ownership of lead arrangers and participants	–	5,907	2,788
− Sample after removing sole lender deals	**4,140**	1,915	

Panel B: Sample distribution of model variables for syndicate ownership sample

	N	Mean	25%	Median	75%
Dependent Variables					
LEAD_OWN	4,140	0.25	0.10	0.19	0.36
LENDER_HERF	4,140	0.21	0.08	0.15	0.31
Information Variables					
DCV	4,140	0.356	0.271	0.339	0.409
TIMELINESS (%)	4,140	1.287	0.533	0.992	1.747
TLR	4,140	0.382	0.266	0.332	0.476
Loan-Specific Variables					
UNRATED	4,140	0.36	–	–	–
NO_LEAD_PRIOR	4,140	0.38	–	–	–
DEAL_SIZE ($ mil.)	4,140	458	75	185	425
LOAN_SPREAD (bps)	4,140	141	55	113	200
LOAN_MATURITY	4,140	3.55	2.00	3.01	5.00
SECURED	4,140	0.40	–	–	–
REVOLVER	4,140	0.84	–	–	–
GEN_COVENANTS	4,140	2.59	0	2	4
FIN_COVENANTS	4,140	1.65	0	2	3
PP_INDICATOR	4,140	0.61	–	–	–
NUM_PREVIOUS_LOANS	4,140	5.65	2	4	8
Borrower-Specific Variables					
PROFITABILITY	4,140	0.03	0.01	0.04	0.07
INTEREST_COVERAGE	4,140	6.16	1.29	2.76	5.59
FIRM_SIZE ($ mil.)	4,140	4,212	270	756	2,782
LEVERAGE	4,140	0.34	0.21	0.32	0.43

Panel C: Pearson correlation matrix of selected model variables.

	LENDER_HERF	DCV	TIMELINESS	TLR	UNRATED	NO_LEAD_PRIOR	PROFITABILITY	LEVERAGE
LEAD_OWN	0.789 *	-0.187 *	-0.056 *	-0.209 *	0.448 *	0.283 *	-0.112 *	-0.065 *
LENDER_HERF		-0.279 *	-0.105 *	-0.278 *	0.430 *	0.288 *	-0.145 *	-0.046 *
DCV			0.408 *	0.157 *	-0.056 *	-0.057 *	0.057 *	-0.015
TIMELINESS				-0.090	0.009 *	-0.010	0.046 *	0.001
TLR					-0.100 *	-0.066 *	0.074 *	-0.054 *
UNRATED						0.214 *	0.040 *	-0.215 *
NO_LEAD_PRIOR							-0.041 *	-0.074 *
PROFITABILITY								-0.353 *

LEAD_OWN is the fraction of the deal owned by the lead arranger. *LENDER_HERF* is the sum of the squared percentage ownership of each lender in the deal syndicate. *DCV* is a credit market based earnings quality measure computed as the Somers' D association statistic obtained from industry specific (2 digit SIC codes) Probit regressions that predict credit rating downgrades. The downgrade predictors are the seasonally adjusted quarterly earnings over the prior 4 quarters. *TIMELINESS* is an equity market based earnings quality measure computed as the R^2 obtained from industry specific (2 digit SIC codes) pooled regressions of market-adjusted returns on quarterly earnings levels and seasonally differenced quarterly earnings. *TLR* is timely-loss recognition measured as the coefficient on negative returns in earnings-returns regressions estimated using quarterly data at the industry level (2 digit SIC codes). *UNRATED* is an indicator variable equal to 1 if the loan is rated and 0 otherwise. *NO_LEAD_PRIOR* is an indicator variable equal to 1 if a lead arranger in the current deal was not a lead arranger in a previous deal with the same borrower. *DEAL_SIZE* is the size of the deal ($ mil.). *LOAN_SPREAD* is the loan spread (in basis points). *LOAN_MATURITY* is the number of years to loan maturity. *SECURED* is an indicator variable equal to 1 if the loan is collateralized and 0 otherwise. *REVOLVER* is an indicator variable equal to 1 if the loan is a revolving loan and 0 otherwise. *GEN_COVENANTS* (*FIN_COVENANTS*) is the number of general (financial) covenants in the contract as reported by Dealscan. *PP_INDICATOR* is an indicator variable equal to 1 if the loan contract contains a performance pricing provision and 0 otherwise. *NUM_PREVIOUS_LOANS* is the number of previous syndicated loans taken by the borrower. *PROFITABILITY* is operating income before depreciation scaled by average total assets. *INTEREST_COVERAGE* is the borrower's interest coverage ratio defined as the sum of interest expense and income before extraordinary items scaled by interest expense. *FIRM_SIZE* is the logarithm of book value of total assets. *LEVERAGE* is the book value of debt (sum of debt in current liabilities and total long-term debt) divided by book value of total assets. * indicates significance at the 1% level based on a two-tailed test.

Table 2
Determinants of Debt Monitoring Structure

	Predicted Sign	Dependent Variable: LEAD_OWN			
		(1)	(2)	(3)	(4)
DCV	(−)	-0.089 (-4.46) ***		-0.084 (-3.85) ***	-0.094 (-4.36) ***
TIMELINESS	(−)		-0.005 (-1.72) *	-0.002 (-0.66)	-0.003 (-1.02)
TLR	(−)				-0.069 (-4.05) ***
UNRATED		0.034 (5.16) ***	0.034 (5.1) ***	0.034 (5.17) ***	0.034 (5.17) ***
NO_LEAD_PRIOR		0.028 (5.25) ***	0.028 (5.29) ***	0.028 (5.28) ***	0.028 (5.25) ***
DEAL_SIZE		-0.064 (-16.59) ***	-0.063 (-16.34) ***	-0.064 (-16.6) ***	-0.064 (-16.58) ***
LOAN_SPREAD		0.002 (0.36)	0.001 (0.19)	0.002 (0.39)	000 (0.04)
LOAN_MATURITY		-0.007 (-4.80) ***	-0.007 (-4.70) ***	-0.007 (-4.80) ***	-0.007 (-4.79) ***
SECURED		0.016 (2.72) ***	0.017 (2.85) ***	0.016 (2.73) ***	0.017 (2.76) ***
REVOLVER		-0.029 (-3.51) ***	-0.029 (-3.49) ***	-0.028 (-3.49) ***	-0.029 (-3.58) ***
GEN_COVENANTS		-0.014 (-2.41) **	-0.014 (-2.42) **	-0.013 (-2.39) **	-0.013 (-2.33) **
FIN_COVENANTS		-0.013 (-2.36) **	-0.012 (-2.26) **	-0.013 (-2.38) **	-0.012 (-2.23) **
PP_INDICATOR		-0.015 (-2.2) **	-0.015 (-2.32) **	-0.015 (-2.2) **	-0.015 (-2.19) **
LOG_PREVIOUS		0.004 (1.05)	0.004 (1.1)	0.004 (1.08)	0.004 (1.18)
PROFITABILITY		-0.137 (-3.50) ***	-0.134 (-3.42) ***	-0.136 (-3.47) ***	-0.144 (-3.67) ***
INTEREST_COVERAGE		-0.003 (-0.23)	-0.002 (-0.18)	-0.003 (-0.22)	000 (0.01)
FIRM_SIZE		-0.020 (-6.39) ***	-0.020 (-6.37) ***	-0.020 (-6.39) ***	-0.020 (-6.44) ***
LEVERAGE		-0.032 (-2.14) **	-0.030 (-1.99) **	-0.032 (-2.14) **	-0.035 (-2.38) **
Year Fixed Effects		Yes	Yes	Yes	Yes
N		4,140	4,140	4,140	4,140
Adj R^2		0.535	0.532	0.534	0.537

Dependent variable is *LEAD_OWN*, the fraction of the deal owned by the lead arranger. *DCV* is a credit market based earnings quality measure computed as the Somers' D association statistic obtained from industry specific (2 digit SIC codes) Probit regressions that predict credit rating downgrades. The downgrade predictors are the seasonally adjusted quarterly earnings over the prior 4 quarters. *TIMELINESS* is an equity market based earnings quality measure computed as the R^2 obtained from industry specific (2 digit SIC codes) pooled regressions of market-adjusted returns on quarterly earnings levels and seasonally differenced quarterly earnings. *TLR* is timely-loss recognition measured as the coefficient on negative returns in earnings-returns regressions estimated using quarterly data at the industry level (2 digit SIC codes). *UNRATED* is an indicator variable equal to 1 if the loan is rated and 0 otherwise. *NO_LEAD_PRIOR* is an indicator variable equal to 1 if a lead arranger in the current deal was not a lead arranger in a previous deal with the same borrower. *DEAL_SIZE* is the logarithm of the deal size. *LOAN_SPREAD* is the logarithm of loan spread (in basis points). *LOAN_MATURITY* is the number of years to loan maturity. *SECURED* is an indicator variable equal to 1 if the loan is collateralized and 0 otherwise. *REVOLVER* is an indicator variable equal to 1 if the loan is a revolving loan and 0 otherwise. *GEN_COVENANTS* (*FIN_COVENANTS*) is the number of general (financial) covenants in the loan contract as reported by Dealscan. *PP_INDICATOR* is an indicator variable equal to 1 if the loan agreement contains a performance pricing provision and 0 otherwise. *LOG_PREVIOUS* is the log of one plus the number of previous syndicated loans taken by the borrower. *PROFITABILITY* is the borrower's operating income before depreciation scaled by average total assets. *INTEREST_COVERAGE* is the borrower's interest coverage ratio defined as the sum of interest expense and income before extraordinary items scaled by interest expense. *FIRM_SIZE* is the logarithm of the borrower's book value of total assets. *LEVERAGE* is the borrower's book value of debt (sum of debt in current liabilities and total long-term debt) divided by book value of total assets. Significance levels of coefficient estimates are based on standard errors adjusted for clustering at the firm level. ***, **, and * indicates significance at 1 percent, 5 percent, and 10 percent levels, respectively, based on a two-tailed test.

Table 3
Determinants of Debt Monitoring Structure

	Pred. Sign	Dependent Variable: *LEAD_OWN*					
		(1)		(2)		(3)	
DCV	(−)	**-0.086**	**(-4.26) *****	**-0.048**	**(-2.35) ****	**-0.060**	**(-2.84) *****
DCV*UNRATED	(−)	**-0.013**	**(-3.36) *****	**-0.049**	**(-6.46) *****	**-0.053**	**(-6.93) *****
DCV*NO_LEAD_PRIOR	(−)			**-0.047**	**(-6.16) *****	**-0.044**	**(-5.65) *****
TLR						-0.060	(-3.62) ***
TLR*UNRATED						-0.013	(-2.30) **
TLR*NO_LEAD_PRIOR						0.028	(1.06)
UNRATED		0.039	(5.69) ***	0.050	(7.06) ***	0.056	(7.60) ***
NO_LEAD_PRIOR		0.028	(5.24) ***	0.048	(7.53) ***	0.036	(2.86) ***
DEAL_SIZE		-0.061	(-15.36) ***	-0.061	(-15.60) ***	-0.062	(-15.68) ***
LOAN_SPREAD		0.003	(0.54)	0.003	(0.55)	0.001	(0.17)
LOAN_MATURITY		-0.007	(-4.87) ***	-0.007	(-4.95) ***	-0.007	(-4.95) ***
SECURED		0.017	(2.87) ***	0.018	(2.95) ***	0.018	(2.91) ***
REVOLVER		-0.030	(-3.66) ***	-0.030	(-3.73) ***	-0.030	(-3.76) ***
GEN_COVENANTS		-0.015	(-2.60) ***	-0.014	(-2.49) **	-0.013	(-2.41) **
FIN_COVENANTS		-0.014	(-2.47) **	-0.014	(-2.54) **	-0.013	(-2.41) **
PP_INDICATOR		-0.011	(-1.72) *	-0.012	(-1.83) *	-0.013	(-2.00) **
LOG_PREVIOUS		0.004	(1.03)	0.002	(0.61)	0.002	(0.68)
PROFITABILITY		-0.138	(-3.52) ***	-0.137	(-3.54) ***	-0.141	(-3.64) ***
INTEREST_COVERAGE		-0.003	(-0.25)	-0.003	(-0.19)	-0.001	(-0.04)
FIRM_SIZE		-0.019	(-6.14) ***	-0.020	(-6.27) ***	-0.020	(-6.37) ***
LEVERAGE		-0.032	(-2.13) **	-0.033	(-2.23) **	-0.035	(-2.36) **
Year Fixed Effects		Yes		Yes		Yes	
N		4,140		4,140		4,140	
Adj R^2		0.536		0.540		0.542	

Dependent variable is *LEAD_OWN*, the fraction of the deal owned by the lead arranger. *UNRATED* is an indicator variable equal to 1 if the loan is rated and 0 otherwise. *NO_LEAD_PRIOR* is an indicator variable equal to 1 if a lead arranger in the current deal was not a lead arranger in a previous deal with the same borrower. *DCV* is a credit market based earnings quality measure computed as the Somers' D association statistic obtained from industry specific (2 digit SIC codes) Probit regressions that predict credit rating downgrades. The downgrade predictors are the seasonally adjusted quarterly earnings over the prior 4 quarters. *DCV*UNRATED* is an interaction variable between *DCV* and *UNRATED*. *DCV*NO_LEAD_PRIOR* is an interaction variable between *DCV* and *NO_LEAD_PRIOR*. *TLR* is timely-loss recognition measured as the coefficient on negative returns in earnings-returns regressions estimated using quarterly data at the industry level (2 digit SIC codes). *TLR*UNRATED* is an interaction variable between *TLR* and *UNRATED*. *TLR* NO_LEAD_PRIOR* is an interaction variable between *TLR* and *NO_LEAD_PRIOR*. *DEAL_SIZE* is the logarithm of the deal size. *LOAN_SPREAD* is the logarithm of loan spread (in basis points). *LOAN_MATURITY* is the number of years to loan maturity. *SECURED* is an indicator variable equal to 1 if the loan is collateralized and 0 otherwise. *REVOLVER* is an indicator variable equal to 1 if the loan is a revolving loan and 0 otherwise. *GEN_COVENANTS* (*FIN_COVENANTS*) is the number of general (financial) covenants in the contract as reported by Dealscan. *PP_INDICATOR* is an indicator variable equal to 1 if the loan agreement contains a performance pricing provision and 0 otherwise. *LOG_PREVIOUS* is the log of one plus the number of previous syndicated loans taken by the borrower. *PROFITABILITY* is the borrower's operating income before depreciation scaled by average total assets. *INTEREST_COVERAGE* is the borrower's interest coverage ratio defined as the sum of interest expense and income before extraordinary items scaled by interest expense. *FIRM_SIZE* is the logarithm of the borrower's book value of total assets. *LEVERAGE* is the borrower's book value of debt (sum of debt in current liabilities and total long-term debt) divided by book value of total assets. Significance levels of coefficient estimates are based on standard errors adjusted for clustering at the firm level. ***, **, and * indicates significance at 1 percent, 5 percent, and 10 percent levels, respectively, based on a two-tailed test.

Table 4
Determinants of Debt Monitoring Structure

	Pred. Sign	Dependent Variable: *LENDER_HERF*					
		(1)		(2)		(3)	
DCV	(−)	-0.068	(-4.02) ***	-0.038	(-2.18) **	-0.046	(-2.52) **
DCV*UNRATED	(−)	-0.011	(-3.34) ***	-0.040	(-5.85) ***	-0.043	(-6.32) ***
DCV*NO_LEAD_PRIOR	(−)			-0.037	(-5.47) ***	-0.035	(-5.24) ***
TLR						-0.037	(-2.40) **
*TLR*UNRATED*						-0.012	(-2.94) ***
*TLR*NO_LEAD_PRIOR*						0.021	(0.85)
UNRATED		0.032	(4.98) ***	0.041	(6.12) ***	0.046	(6.74) ***
NO_LEAD_PRIOR		0.025	(5.00) ***	0.041	(6.82) ***	0.032	(2.77) ***
DEAL_SIZE		-0.056	(-14.54) ***	-0.056	(-14.67) ***	-0.056	(-14.67) ***
LOAN_SPREAD		0.008	(1.88) *	0.008	(1.88) *	0.007	(1.59)
LOAN_MATURITY		-0.007	(-5.50) ***	-0.007	(-5.55) ***	-0.007	(-5.52) ***
SECURED		0.016	(2.91) ***	0.017	(2.98) ***	0.016	(2.93) ***
REVOLVER		-0.033	(-4.50) ***	-0.033	(-4.52) ***	-0.033	(-4.53) ***
GEN_COVENANTS		-0.008	(-1.68) *	-0.008	(-1.58)	-0.008	(-1.51)
FIN_COVENANTS		-0.015	(-2.75) ***	-0.015	(-2.81) ***	-0.015	(-2.73) ***
PP_INDICATOR		-0.009	(-1.50)	-0.009	(-1.56)	-0.010	(-1.73) *
LOG_PREVIOUS		0.003	(0.89)	0.002	(0.53)	0.002	(0.58)
PROFITABILITY		-0.135	(-3.93) ***	-0.133	(-3.93) ***	-0.135	(-3.98) ***
INTEREST_COVERAGE		0.009	(0.69)	0.010	(0.75)	0.011	(0.83)
FIRM_SIZE		-0.015	(-5.15) ***	-0.015	(-5.26) ***	-0.015	(-5.35) ***
LEVERAGE		-0.030	(-2.13) **	-0.031	(-2.20) **	-0.032	(-2.26) **
Year Fixed Effects		Yes		Yes		Yes	
N		4,140		4,140		4,140	
Adj R^2		0.504		0.507		0.508	

Dependent variable is *LENDER_HERF*, the sum of the squared percentage ownership of each lender in the deal syndicate. *UNRATED* is an indicator variable equal to 1 if the loan is rated and 0 otherwise. *NO_LEAD_PRIOR* is an indicator variable equal to 1 if a lead arranger in the current deal was not a lead arranger in a previous deal with the same borrower. *DCV* is a credit market based earnings quality measure computed as the Somers' D association statistic obtained from industry specific (2 digit SIC codes) Probit regressions that predict credit rating downgrades. The downgrade predictors are the seasonally adjusted quarterly earnings over the prior 4 quarters. *DCV*UNRATED* is an interaction variable between *DCV* and *UNRATED*. *DCV* NO_LEAD_PRIOR* is an interaction variable between *DCV* and *NO_LEAD_PRIOR*. *TLR* is timely-loss recognition measured as the coefficient on negative returns in earnings-returns regressions estimated using quarterly data at the industry level (2 digit SIC codes). *TLR*UNRATED* is an interaction variable between *TLR* and *UNRATED*. *TLR* NO_LEAD_PRIOR* is an interaction variable between *TLR* and *NO_LEAD_PRIOR*. *DEAL_SIZE* is the logarithm of the deal size. *LOAN_SPREAD* is the logarithm of loan spread (in basis points). *LOAN_MATURITY* is the number of years to loan maturity. *SECURED* is an indicator variable equal to 1 if the loan is collateralized and 0 otherwise. *REVOLVER* is an indicator variable equal to 1 if the loan is a revolving loan and 0 otherwise. *GEN_COVENANTS* (*FIN_COVENANTS*) is the number of general (financial) covenants in the contract as reported by Dealscan. *PP_INDICATOR* is an indicator variable equal to 1 if the loan agreement contains a performance pricing provision and 0 otherwise. *LOG_PREVIOUS* is the log of one plus the number of previous syndicated loans taken by the borrower. *PROFITABILITY* is the borrower's operating income before depreciation scaled by average total assets. *INTEREST_COVERAGE* is the borrower's interest coverage ratio defined as the sum of interest expense and income before extraordinary items scaled by interest expense. *FIRM_SIZE* is the logarithm of the borrower's book value of total assets. *LEVERAGE* is the borrower's book value of debt (sum of debt in current liabilities and total long-term debt) divided by book value of total assets. Significance levels of coefficient estimates are based on standard errors adjusted for clustering at the firm level. ***, **, and * indicates significance at 1 percent, 5 percent, and 10 percent levels, respectively, based on a two-tailed test.

Table 5
Performance Pricing Sample Selection and Descriptive Statistics

Panel A: Description of performance pricing sample selection procedure.

Performance Pricing Sample Selection (Loan Level)	Loans	Deals	Firms
Performance Pricing Sample (Loan Level)			
− Sample of syndicated loan contracts matched to Compustat	33,375	24,441	6,243
− Sample after excluding financial firms	29,282	21,061	5,468
− Sample after requiring availability of loan and borrower-specific variables	17,819	12,483	4,002
− Sample with performance pricing provisions	7,194	5,044	2,273
− Performance pricing sample after requiring ratings data in Dealscan or Moody's Databases	**4,203**	2,928	1,232
• Percentage with ratio-based performance pricing contracts	54.3 %		
• Percentage with rating-based performance pricing contracts	45.7 %		

Panel B: Accounting based and ratio based measures used in performance pricing provisions.

Measure Description	Frequency	% in Total Number of PP Provisions
Accounting-based Performance Pricing Provisions		
− Debt Service Coverage	11	0.3 %
− Debt to Tangible Net Worth	44	1.0 %
− Fixed Charge Coverage	91	2.1 %
− Interest Coverage	108	2.5 %
− Leverage	142	3.3 %
− Senior Debt to EBITDA	88	2.0 %
− Senior Leverage	7	0.2 %
− Total Debt to EBITDA	1,742	40.5 %
− Tailored Ratios (User Conditions)	140	3.3 %
Ratings-based Performance Pricing Provisions		
− Senior Debt Rating	1,907	44.4 %
− Commercial Paper Rating	18	0.4 %
Total Number of Performance Pricing Provisions	**4,298**	**100.0 %**
− Number of loans with two rating-based contracts	10	
− Number of loans with two accounting ratio-based contracts	85	
Total Number of Loans in Performance Pricing Sample	**4,203**	

Table 5 (cont.)
Performance Pricing Sample Selection and Descriptive Statistics

Panel C: Sample distribution of model variables for performance pricing sample

	N (loans)	Mean	25%	Median	75%
Dependent Variable					
PP_RATIO	4,203	0.54	–	–	–
Information Variables					
DCV	4,203	0.347	0.253	0.333	0.407
TIMELINESS (%)	4,203	1.196	0.483	0.937	1.747
TLR	4,203	0.365	0.262	0.332	0.476
Loan-Specific Variables					
LOAN_SIZE ($ mil.)	4,203	447	100	230	500
DEAL_SIZE ($ mil.)	4,203	776	200	400	850
LOAN_SPREAD (bps)	4,203	155	63	140	238
LOAN_MATURITY	4,203	4.01	2.84	4.95	5.00
SECURED	4,203	0.50	–	–	–
RATING_GROUP	4,203	4.73	4	5	6
REVOLVER	4,203	0.76	–	–	–
INCREASING_PP	4,203	0.48	–	–	–
DECREASING_PP	4,203	0.89	–	–	–
GEN_COVENANTS	4,203	4.39	2	4	7
FIN_COVENANTS	4,203	2.42	1	2	3
Borrower-Specific Variables					
PROFITABILITY	4,203	0.03	0.01	0.04	0.06
INTEREST_COVERAGE	4,203	5.28	1.24	2.42	4.53
FIRM_SIZE (& mil.)	4,203	4,868	637	1,559	4,014
LEVERAGE	4,203	0.38	0.25	0.36	0.49

PP_RATIO is an indicator variable equal to 1 (equal to 0) if an accounting ratio (credit rating) based performance pricing provision is used in the syndicated loan contract. *DCV* is a credit market based earnings quality measure computed as the Somers' D association statistic obtained from industry specific (2 digit SIC codes) Probit regressions that predict credit rating downgrades. The downgrade predictors are the seasonally adjusted quarterly earnings over the prior 4 quarters. *TIMELINESS* is an equity market based earnings quality measure computed as the R^2 obtained from industry specific (2 digit SIC codes) pooled regressions of market-adjusted returns on quarterly earnings levels and seasonally differenced quarterly earnings. *TLR* is timely-loss recognition measured as the coefficient on negative returns in earnings-returns regressions estimated using quarterly data at the industry level (2 digit SIC codes). *LOAN_SIZE* is the individual loan size ($ mil.). *DEAL_SIZE* is the size of the deal ($ mil.). *LOAN_SPREAD* is the loan spread (in basis points). *LOAN_MATURITY* is the number of years to loan maturity. *SECURED* is an indicator variable equal to 1 if the loan is collateralized and 0 otherwise. *RATING_GROUP* is the loan rating (issuer rating if the loan rating is missing) coded from 1 for AAA/Aaa rated loans to 9 for C/C rated loans. *REVOLVER* is an indicator variable equal to 1 if the loan is a revolving loan and 0 otherwise. *INCREASING_PP* is equal to 1 if the loan contract has an interest increasing performance pricing provision and 0 otherwise. *DECREASING_PP* is equal 1 if the loan contract has an interest decreasing performance pricing provision and 0 otherwise. *GEN_COVENANTS* (*FIN_COVENANTS*) is the number of general (financial) covenants in the contract as reported by Dealscan. *PROFITABILITY* is the borrower's operating income before depreciation scaled by average total assets. *INTEREST_COVERAGE* is the borrower's interest coverage ratio defined as the sum of interest expense and income before extraordinary items scaled by interest expense. *FIRM_SIZE* is the borrower's book value of total assets. *LEVERAGE* is the borrower's book value of debt (sum of debt in current liabilities and total long-term debt) divided by book value of total assets.

Table 6
Probit Regression Coefficient Estimates (t-stat) for Predicting the Probability of Requiring Accounting-based Performance Pricing Provisions in the Syndicated Loan Contract

	Predicted Sign	Dependent Variable: *PP_RATIO*							
		(1)		(2)		(3)		(4)	
DCV	(+)	0.197	(3.51) ***			0.188	(3.01) ***	0.174	(2.71) ***
TIMELINESS	(+)			0.095	(1.71) *	0.038	(0.59)	0.093	(1.29)
TLR	(+)							0.098	(2.67) ***
LOAN SIZE		-0.245	(-3.90) ***	-0.223	(-3.58) ***	-0.251	(-4.03) ***	-0.242	(-3.89) ***
DEAL_SIZE		0.198	(2.42) **	0.172	(2.25) **	0.201	(2.50) **	0.196	(2.47) **
LOAN_SPREAD		0.490	(4.18) ***	0.462	(3.96) ***	0.489	(4.15) ***	0.509	(4.27) ***
LOAN_MATURITY		0.171	(7.21) ***	0.158	(6.33) ***	0.172	(7.19) ***	0.167	(7.02) ***
SECURED		0.591	(5.32) ***	0.580	(5.62) ***	0.581	(5.38) ***	0.564	(5.23) ***
RATING_GROUP		0.400	(5.44) ***	0.414	(5.55) ***	0.403	(5.44) ***	0.381	(5.15) ***
REVOLVER		0.214	(2.45) **	0.193	(2.14) **	0.214	(2.43) **	0.210	(2.33) **
INCREASING_PP		0.110	(0.76)	0.079	(0.54)	0.106	(0.72)	0.089	(0.61)
DECREASING_PP		0.442	(2.45) **	0.472	(2.63) ***	0.449	(2.47) **	0.442	(2.42) **
GEN_COVENANTS		-0.069	(-0.56)	-0.072	(-0.61)	-0.069	(-0.55)	-0.062	(-0.50)
FIN_COVENANTS		0.190	(1.77) *	0.178	(1.70) *	0.195	(1.82) *	0.203	(1.89) *
PROFITABILITY		-0.373	(-0.47)	-0.418	(-0.52)	-0.400	(-0.50)	-0.388	(-0.47)
INTEREST_COVERAGE		0.926	(2.07) **	0.816	(2.19) **	0.919	(2.13) **	0.775	(1.84) *
FIRM_SIZE		-0.471	(-6.46) ***	-0.460	(-6.58) ***	-0.470	(-6.41) ***	-0.473	(-6.52) ***
LEVERAGE		-0.477	(-1.72) *	-0.521	(-1.88) *	-0.469	(-1.68) *	-0.445	(-1.56)
Year Fixed Effects		Yes		Yes		Yes		Yes	
N		4,203		4,203		4,203		4,203	
Likelihood Ratio		3562.33 ***		3513.92 ***		3563.90 ***		3583.41 ***	
Rescaled R^2		0.765		0.759		0.766		0.768	
Somers' D		0.914		0.910		0.914		0.916	

Dependent variable is *PP_RATIO*, equal to 1 (equal to 0) if an accounting ratio (credit rating) based performance pricing provision is used in the syndicated loan contract. *DCV* is a credit market based earnings quality measure computed as the Somers' D association statistic obtained from industry specific (2 digit SIC codes) Probit regressions that predict credit rating downgrades. The downgrade predictors are the seasonally adjusted quarterly earnings over the prior 4 quarters. *TIMELINESS* is an equity market based earnings quality measure computed as the R^2 obtained from industry specific (2 digit SIC codes) pooled regressions of market-adjusted returns on quarterly earnings levels and seasonally differenced quarterly earnings. *TLR* is timely-loss recognition measured as the coefficient on negative returns in earnings-returns regressions estimated using quarterly data at the industry level (2 digit SIC codes). *LOAN_SIZE* is the logarithm of the individual loan size. *DEAL_SIZE* is the logarithm of the deal size. *LOAN_SPREAD* is the logarithm of loan spread (in basis points). *LOAN_MATURITY* is the number of years to loan maturity. *SECURED* is an indicator variable equal to 1 if the loan is collateralized and 0 otherwise. *RATING_GROUP* is the loan rating (issuer rating if the loan rating is missing) coded from 1 for AAA/Aaa rated loans to 9 for C/C rated loans. *REVOLVER* is an indicator variable equal to 1 if the loan is a revolving loan and 0 otherwise. *INCREASING_PP* is equal to 1 if the loan contract has an interest increasing performance pricing provision and 0 otherwise. *DECREASING_PP* is equal 1 if the loan contract has an interest decreasing performance pricing provision and 0 otherwise. *GEN_COVENANTS* (*FIN_COVENANTS*) is the number of general (financial) covenants in the contract as reported by Dealscan. *PROFITABILITY* is the borrower's operating income before depreciation scaled by average total assets. *INTEREST_COVERAGE* is the borrower's interest coverage ratio defined as the sum of interest expense and income before extraordinary items scaled by interest expense. *FIRM_SIZE* is the logarithm of the borrower's book value of total assets. *LEVERAGE* is the borrower's book value of debt (sum of debt in current liabilities and total long-term debt) divided by book value of total assets. Significance levels of coefficient estimates are based on standard errors adjusted for clustering at the firm level. ***, **, and * indicates significance at 1 percent, 5 percent, and 10 percent levels, respectively, based on a two-tailed test.