Financial Accounting Characteristics and Debt Covenants

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Abstract[1]

We examine the relation between financial accounting characteristics and accounting-based covenants. We hypothesize that use of accounting-based covenants is more likely when asymmetric timeliness is higher and accounting discretion is reduced, because the covenants can more efficiently reduce agency costs in these circumstances. Overall, we find little association between the use of accounting-based covenants in lending agreements and three financial reporting characteristics (1) the magnitude of past discretionary accruals, (2) Basu's (1997) asymmetric timeliness measure, or (3) Ball and Shivakumar's (2006) asymmetric timeliness measure. We also are unable to find a consistently significant relation between these accounting characteristics and initial-covenant slack. Our results suggest that the relation between the effectiveness of accounting-based and these characteristics is marginal.

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I. Introduction

We estimate the relation between financial accounting characteristics and firms' use of accounting-based covenants in lending agreements and the amount of covenant slack in these agreements. The financial accounting characteristics studied are the magnitude of prior discretionary accruals and asymmetric timeliness. We find the use of accounting-based covenants is not clearly associated with the asymmetric timeliness of earnings whether asymmetric timeliness is measured according to the techniques of Basu (1997) or Ball and Shivakumar (2006). Neither is the use of accounting-based covenants significantly associated with the absolute value of discretionary accruals. Furthermore, we do not find a consistent relation between asymmetric timeliness or absolute discretionary accruals on the one hand and covenant slack on the other.

Research suggests that accounting-based covenants are effective at limiting bondholder/stockholder conflicts (e.g., Healy and Palepu, 1990, and Billett, King, and Mauer, 2006) and that the characteristics of accounting-based covenants are consistent with contracting-efficiency considerations (e.g., Leftwich, 1983 and Asquith, Beatty, Weber, 2005). Researchers also provide evidence that debt contracting incentives shape financial reporting characteristics (Ball, Kothari, and Robin, 2000 and Bushman and Piotroski, 2005) and that financial reporting characteristics are related to debt pricing (Moerman, 2006, and Bharath et al., 2004). Taken together these studies imply that accounting characteristics have contracting efficiency implications because they alter the effectiveness of bond covenants. We argue that a treatment is more likely to be used when it is more effective. Therefore, if a given accounting characteristic (e.g. lower discretionary accruals) increases the efficiency of accounting-based covenants we will be more likely to observe the use of accounting-based covenants when that characteristic is

present. We use this logic to draw inferences from the correlation between accounting-based covenant use and a given set of financial reporting characteristics.

Debt covenants reduce shareholder moral hazard by providing bondholders with additional rights prior to severe financial distress. The level of covenant slack reflects the trade-off between the benefits of a protective trip-wire and the costs of renegotiation. If untimely and unreliable accounting reduce the ability of accounting covenants to function as an advanced warning device and lenders reduce slack in an attempt to counteract this deficiency, then we expect covenant slack to be reduced as accounting becomes less timely and less reliable. Therefore, we examine the relation between covenant slack and proxies for these accounting characteristics.

The accounting characteristics we study are discretionary accruals and 'bad news' sensitivity. These characteristics have been associated with the timeliness and reliability of financial reports.[2] Researchers have attempted to link these characteristics with contracting efficiency. Existing work focuses on the relation between these characteristics and borrowing costs (Ahmed et al., 2002, and Bharath et al, 2004) and covenant violations (Zhang, 2004). While these papers look for effects given contracts are in place, we examine factors associated with the ex-ante choice of covenants.[3]

Using the Loan Pricing Corporation's Dealscan database, we identify private-lending agreements in a given year that contain accounting-based covenants. Accounting-based covenants include requirements to maintain a given interest-coverage ratio, current ratio, net worth, etc. We then examine the relation between prior 'bad news' sensitivity and discretionary accrual magnitude and the use of accounting covenants in the current period. We hypothesize that if these characteristics are

[2] For examples of research discussing the relation between discretionary accruals and earnings management see Dechow, et al., 1995, Guay, Kothari, and Watts, 1996, and Subramanyam, 1996. Basu, 1997, ties 'bad news' sensitivity to timeliness.

[3] Demerjian's (2007) also uses an ex-ante perspective. He examines whether profitable companies with low earnings volatility are more likely to use accounting-based covenants.

associated with accounting-covenant efficiency, they should be related to the use of accounting covenants and the amount of covenant slack.

We find that accounting-based covenants are less likely to be used when the magnitude of discretionary accruals is higher in prior years, but this relation is not significant. EBITDA-based covenants use an adjusted measure of GAAP income as part of the computation of the covenant benchmark and this measure will not be as strongly affected by discretionary accruals such as depreciation. To provide a more powerful test, we divide accounting-based covenants into two categories, (1) "EBITDA-based covenants" and (2) balance sheet and earnings-based covenants. (hereafter "B&E covenants"). However, we do find a significant relation between the use of "B&E covenants" and the magnitude of discretionary accruals.

To further investigate the affect of discretionary accrual magnitude on debt covenants, we examine whether covenant slack is reduced for firms with large absolute discretionary accruals. We find a marginally significant negative relation between the magnitude of discretionary accruals and covenant slack in current-ratio and tangible net worth covenants but no significant relation for net-worth covenants. Overall, these results provide weak evidence supporting the notion that covenants are tightened to offset increased discretion in the computation of numbers in financial reports.

We do not find a strong relation between 'bad news' sensitivity and the use of accounting covenants. We use two measure of 'bad news' sensitivity: Basu's (1997) return-based measure and Ball and Shivakumar's (2006) cash-flow-based measure. We estimate these measures at the industry level. The Basu–based results provide marginally significant evidence that accounting covenant use increases as accounting becomes timelier, overall, and with respect to 'bad news.' The strongest results are with respect to use of "B&E covenants." The use of these covenants increases significantly with both

the asymmetric timeliness and the overall timeliness of earnings. However, covenant-slack tests using the Basu-measure do not find a consistently positive relation between covenant slack and timeliness. In fact, contrary to what we expect net-worth covenant slack is declining significantly in asymmetric timeliness. For the Ball and Shivakumar-based measure, we find no significant relation between timeliness of accruals and use of accounting-based covenants. Nor do we find a consistently significant positive relation between covenant slack and timeliness.

Our tests are grounded in the notion that a remedy is more likely to be used when it is more effective. We also assume accounting-based covenants reduce the incentive conflict between bondholders and shareholders. Given these premises, our results suggest that the efficacy of accounting-based covenants is not significantly increased in situations where discretionary accruals are limited and where earnings are more asymmetrically sensitive to 'bad news.' Our results represent a challenge to the argument that asymmetric timeliness increases the efficiency of debt contracting.

Caveats Low power is a possible explanation for our lack of findings—especially in light of the difficulties in measuring accounting discretion and asymmetric timeliness at the firm level. To defend the validity of these results, we would argue that our tests are based on over 6,000 firm-level observations. Moreover, we have used methods to estimate these accounting characteristics that replicate those used by prior literature to produce significant results. Finally, as our robustness tests indicate, our results hold for a variety of specifications and estimation procedures.

II. Hypothesis Development

To provide a framework for understanding the relation between financial-accounting characteristics and accounting-based-bond covenants, we analyze how

accounting characteristics alter the costs and benefits associated with covenants. We assume firms maximize the combined wealth of bondholders and stockholders, i.e., "market value maximization" (Fama and Miller, 1972). Conflicting bondholder-stockholder interests imply that stockholders will be tempted to deviate from "market value maximization" and instead maximize the value of shareholders' equity. Expected deviations will be reflected in the price of the firm's securities. Thus, the firm's shareholders have an incentive to assure lenders that managers will not deviate from market value maximization and to do so at the lowest possible cost (Fama, 1978). Bond covenants are one way to provide this assurance (Myers, 1977, and Smith and Warner, 1979).

For example, a minimum-net-worth covenant can be used to prevent the payment of dividends that transfer wealth from bondholders to stockholders (Kalay, 1982). As the value of the firm's assets (V_A) declines relative to the promised payment on the firm's debt (P), a dividend of a given amount results in larger transfer of wealth from bondholders to stockholders. If the debt is about to mature, and $V_A < P$, every dollar of dividends paid to shareholders reduces the value of debt by a dollar. However, if, at the maturity of the debt, $V_A > P$, a dividend of $V_A - P$ can be paid to shareholders without affecting the value of the debt. Clearly, the difference between V_A and P is an important factor in determining whether or not dividend transfers wealth from bondholders to stockholders.[4] A minimum-net-worth covenant prevents wealth transfers by giving bondholders the option to demand repayment or renegotiation of the loan if net worth falls below a prearranged amount. By using net worth as a proxy for $V_A - P$ the covenant grants additional rights to bondholders precisely when shareholders/bondholder conflicts assume greater economic significance. In this way, the covenant reduces the agency

[4] The variance of V_A and the time remaining until the maturity of the debt are also important factors. See Galai and Masulis (1976).

costs arising from debt (Jensen and Meckling, 1976) and increases the value of the firm. Accounting-based covenants that use other benchmarks (e.g., earnings before interest taxes and depreciation to interest expense, debt to equity, senior debt to cash flow, and current assets to current liabilities) act in a similar way to reduce the agency costs of debt. That is, they give bondholders additional rights when incentive conflicts become more severe.

However, adding covenants to a lending agreement leads to incremental costs. These additional costs include the cost to negotiate and monitor these covenants. Moreover, when covenant violation occurs, the lender decides when to exercise the option to renegotiate and does so to maximize his wealth. The expected deviation from market value maximization reduces the ex-ante value of the firm. Aside from these costs, obtaining outside financing in the presence of significant information asymmetry between borrowers and lenders is costly (Myers, 1984 and Myers and Majluf, 1984). The results of El-Gazzar and Pastena, 1990, suggest the administration costs are economically meaningful. They find debt featuring multiple lenders typically has fewer financial restrictions than single lender debt—presumably because negotiation, renegotiation, and monitoring costs are increasing in the number of lenders.

Given the costs, accounting-based covenants will not be used if they do not provide sufficient benefits in the form of reduced agency costs (hereafter "agency benefits"). We argue that accounting characteristics affect the ability of covenants to provide agency benefits. A number of factors inhibit the ability of financial statement numbers to provide the basis for covenants that reduce agency costs. First, the firm's accounting system can be slow to reflect changes in V_A. Moreover, bond values are more sensitive to declines in V_A than increases.[5] Therefore, the accounting system's timeliness

[5] Frankel, 1992 uses an option pricing framework based on Galai and Masulis, 1976, to illustrate these points.

with respect to bad news can be more critical to the reduction of agency costs than the accounting system's timeliness with respect to good news (Watts, 2003). Second, the accounting system may not produce numbers that are sufficiently verifiable and reliable measures of V_A. When an accounting number used to assess covenant compliance cannot be verified, managers can avoid covenant violations by distorting the number. A noisy number reduces the likelihood that a covenant will provide rights to bondholders when necessary. For example, if we assume that net worth on the balance sheet is unrelated to $V_A - P$, then a net-worth covenant is unlikely to grant additional rights to bondholders when conflicting incentives are more pronounced. In particular, the covenant will not provide bondholders with a reliable and fair means of preventing liquidating dividends. In such a case, the covenant provides little agency benefit and is unlikely to be used given its costs.

We use the magnitude of discretionary accruals as a proxy for the verifiability and noise in financial accounting numbers. Accruals are defined as the difference between net income and operating cash flow. Differences between net income and cash flow are expected based on the firm's growth and production and investment decisions. By estimating a modified version of the Jones model (Jones, 1991, and Dechow, et al., 1995) our intention is to provide a measure of the magnitude of accruals that are at the discretion of the manager and to produce a proxy for the verifiability and reliability of reported financial accounting numbers and thus their ability to provide agency benefits when used as the basis for covenants.

We do not have strong priors on the relation between the agency benefits of accounting-based covenants and the magnitude of discretionary accruals. On the one hand, accruals can provide timely information about V_A that is incremental to operating cash flows in cases where cash flows can be predicted but have not yet occurred

(Dechow, 1994, Subramanyam, 1996, Dechow, Kothari, and Watts, 1998, and Ball and Shivakumar, 2006). Accruals can counter the negative serial correlation in cash flows, which hinders the ability of cash flows to measure changes in V_A (Dechow and Schrand, 2004). Furthermore, if reported accruals are merely a linear function of sales and property plant and equipment and therefore (given sales and PP&E) can be computed without reference to managers' private information, they would add little to contracting efficiency beyond operating cash flows. A formula could substitute for reported accruals. On the other hand, research links discretionary accruals to avoidance of covenant violations (Defond and Jiambalvo, 1994). In addition, Xie's, 2001, finding that discretionary accruals have significant explanatory power for future returns suggests caution when using the correlation between accruals and returns to isolate accrual manipulation.

In sum, efficiently using discretionary accruals to augment the timeliness and reliability of operating cash flows as a performance measure implies no relation between the magnitude of discretionary accruals and the use of accounting-based covenants. Alternatively, if discretionary accruals are used to distort earnings, reducing its reliability as a performance measure, we would expect less use of accounting-based covenants in situations where the magnitude of discretionary accruals is large. Therefore our first hypothesis is as follows:

> **H1: The use of accounting-based covenants is negatively related to the magnitude of discretionary accruals.**

We also examine the relation between measures of earnings timeliness and the use of accounting-based covenants. When earnings are less timely, accounting-based covenants are less effective in reducing agency costs, because when changes in V_A are not immediately reflected in accounting numbers used to assess covenant compliance,

covenants do not prevent the transfer of wealth from bondholders to stockholders. For example, if reported net worth does not reflect economic losses incurred in the current period, the firm can pay liquidating dividends without violating its minimum-net-worth covenant. Similarly, if reported net worth does not reflect gains generated by the firm in the current period, a minimum-net-worth covenant can reduce firm value by restricting the payment of dividends, even though this restriction provides little benefit to the bondholders.[6] In sum, reduced earnings timeliness, reduces the agency benefits of accounting-based covenants, and we expect that they will be used less frequently.

We also test for agency benefits from asymmetrically timely recognition of losses over gains. Watts (2003, p. 209) argues that "Conservatism constrains managerial opportunistic behavior and offsets managerial biases with its asymmetrical verifiability requirement." Echoing this sentiment, Ball et al. (2000, 2), state, "conservatism as we define it makes leverage and dividends restrictions binding more quickly…Conservative accounting thus facilitates monitoring of managers and of debt and other contracts…" Conservatism can be defined as requiring a higher standard of evidence for the recognition of gains than for losses. As evidence accumulates, conservatism implies that losses will tend to be recognized in a more timely manner than gains. Guay and Verrecchia, 2006, argue incorporating difficult-to-verify news is costly and because bondholders are more concerned about bad news it may be more efficient to incorporate difficult-to-verify bad news and ignore difficult-to-verify good news. Empirical results suggest conservatism is associated with increased contracting efficiency (e.g., Ahmed et al., 2002, Zhang, 2004). Thus, our second hypothesis stated in alternative form is:

> **H2: Conditional on the timely recognition of good news, the use of accounting-based covenants is positively related to incremental timeliness in the recognition of bad news.**

[6] This argument assumes dividends policy affects firm value.

Initial covenant slack reflects a trade-off between agency costs and renegotiation costs. To minimize agency costs a firm will reduce covenant slack. Reducing covenant slack allows the lender to renegotiate the terms of the loan prior to significant deterioration in the credit worthiness of the borrower. As part of this renegotiation process, the lender can request updated financial information from the borrower (Dichev and Skinner, 2002). In this way, tighter covenants allow the lender to closely monitor the financial condition of the borrower and rapidly gain additional rights should incentives problems arise.

To minimize renegotiation costs a firm will increase covenant slack. Myers, 1977, notes that renegotiation can be mutually beneficial to lender and borrower when the net present value of an investment project is positive but less than the promised payment on the debt. However, when a covenant is violated, the lender is granted the option to renegotiate or collect the loan. His decisions will be based on a desire to maximize his payout rather than the value of the firm. As covenant slack is reduced, ceteris paribus, the probability that the lender will be given the option to renegotiate or collect on the loan increases. Thus, the expected costs of this non-market value maximizing renegotiation are increased by reducing slack.

More timely and reliable financial reports can substitute for reduced covenant. For example if accounting-based covenants are used in a lending agreement and financial statements are more reliable, the lender will be less concerned that the borrower is delaying covenants violations by earnings manipulation. Therefore, if accounting is more reliable, an accounting-based covenant can achieve a given level of control with more covenant slack.

A similar argument can be made for the timeliness of earnings. That is, reducing covenant slack is one way to ensure that an accounting-based covenant provides early

warning of financial difficulties. More timely earnings, in particular, with regard to 'bad news,' can provide a substitute for reduced slack. Therefore, hypotheses three and four, are as follows:

H3: Covenant slack is negatively related to the magnitude of discretionary accruals.

H4: Conditional on timeliness in the recognition of good news, covenant slack is positively related to the timeliness in the recognition of bad news.

Efficiency is improved if accounting and covenant choices can be made simultaneously. The firm can thereby minimize (1) the costs of reliable financial statements, (2) renegotiation costs, (3) the monitoring and administrative costs of covenants, and (4) agency costs of debt. Therefore, we expect some endogeneity in the relation between accounting characteristics and accounting covenants. The effect of endogeneity is magnified if debt levels and covenants are jointly determined. We argue that regressions of current covenant characteristics on lagged accounting characteristics are suitable way to reduce endogeneity. We use lagged accounting characteristics to proxy for pre-determined values of the independent variables. A significant portion of the reliability and timeliness of a firm's financial statements is fixed by the firm's prior production and investment decisions. For example, the reliability of the financial reports a grocery store, which has a short operating cycle, is likely to be higher than that of a construction firm which is required to estimate income on its yet-to-be-completed projects. Moreover, the portion of a firm's accounting timeliness and reliability that is fixed by prior production/investment decisions is potentially more relevant to the form of subsequent covenants, because the firm can credibly commit to it. Second, to limit endogeneity, we also adopt a two-stage least squares estimation framework where we treat leverage as endogenous. In the search for valid instruments we aim to find

exogenous variables that are economically related to leverage choices but are uncorrelated with the error term of the second-stage regression relating the incidence of accounting-based covenants to corporate accounting timeliness and reliability. We instrument leverage with the average book leverage of other companies in the same industry based on the premises that (1) similar firms have similar capital structures and (2) competitors' financing policy decisions impact a company's capital structure decision through competitive pressure in the underlying product markets (Brander and Lewis, 1986).

III. Data

Our empirical analysis has two components. First we examine whether the use of accounting-based covenants is related to accounting quality. Second we investigate the relation between covenant slack in accounting-based covenants and accounting quality. In this section, we provide a brief description of the variables used in our models. Further details on the computation of each variable can be found in Table 1.

3.1. Measures for Accounting Quality in Contracting

We seek to measure two underlying characteristics when building proxies for accounting quality in contracting. The first is asymmetric timeliness in reflecting economic losses in the accounting statements. The second is the extent of managerial discretion in recognizing economic events in financial statements. To capture asymmetric timeliness, we use the cash flow/accruals regressions of Ball and Shivakumar (2006) and the earnings/returns model of Basu (1997). To capture the extent of managerial discretion side, we use absolute discretionary accruals, based on the Jones (1991) model.

3.1.1. Timeliness of loss recognition (Ball and Shivakumar)

Following Ball and Shivakumar (2005, 2006), we estimate a piecewise-linear regression of accruals on cash flows as follows:

$$\frac{ACC_{i,t}}{TA_{i,t-1}} = \alpha_{0,j} + \alpha_{1,j} D_{OCF_{i,t}<0} + \alpha_{2,j} \frac{OCF_{i,t}}{TA_{i,t-1}} + \alpha_{3,j} \frac{OCF_{i,t}}{TA_{i,t-1}} * D_{OCF_{i,t}<0} + \varepsilon_{i,t}, \quad (1)$$

where *ACC* are accruals, *OCF* is operating cash flow, *TA* is total assets, *D* is an indicator variable equal to one when operating cash flow is less than zero, *i* indexes the firm, *t* indexes the year, and *j* indexes the three-digit SIC code industry. The definitions of the variables in the model follow those of Ball and Shivakumar (2006).[7] We use industry-level estimates to avoid measurement error arising from insufficient data at the firm level.[8] Our measure of timeliness of loss recognition is the coefficient $\alpha_{3,j}$. We estimate this regression each year using the prior ten years of data beginning in 1989 and rolling forward until 2004. The estimates from these regressions are labeled timeliness of loss recognition coefficients for the following fiscal period, e.g. estimates from the 1980 to 1989 interval provide the independent variables for our fiscal 1990 bond-covenant regressions. The corresponding industry loss recognition measure is assigned to each sample firm. To compute a reliable measure of asymmetric timeliness we require at least ten firms to be present in the industry.

3.1.2. Timeliness of loss recognition (Basu)

We employ another measure of timely loss recognition, estimated using the market-based model of Basu (1997). The model relates earnings to contemporaneous

[7] In the robustness section, we discuss results with estimates of accruals derived from the balance sheet as in Ball and Shivakumar (2005). In the tables below we present estimates based on the definition of accruals as the difference between the income before extraordinary items (#123) net of net income from operating activities (#308) scaled by the lagged total assets (#6).

[8] We also compute a firm-level measure of timeliness of loss recognition on a sample that requires ten firm-year observations. We discuss the results using that measure in the robustness section.

stock returns, which serve as a proxy for economic gains and losses. Following Basu (1997), we estimate the regression of accounting income on stock returns:

$$EP_{i.t} = \beta_{0,j} + \beta_{1,j} D_{R_{i,t}<0} + \beta_{2,j} R_{i,t} + \beta_{3,j} D_{R_{i,t}<0} * R_{i,t} + \xi_{i,t}, \quad (2)$$

where *EP* is earnings to price, *R* is annual returns, and *D* is an indicator variable equal to one when returns are negative.[9] The incremental timeliness of earnings loss recognition is measured by $\beta_{3,j}$. We estimate the above regression over the prior ten years by three-digit SIC code industry, indexed by j.[10] We use $\beta_{2,j}$ to estimate timely *gain* recognition.

3.1.3. Absolute abnormal accruals

We use the Jones (1991) model to estimate discretionary accruals:

$$\frac{ACC_{i,t}}{TA_{i,t-1}} = \gamma_{1,j,t} \frac{1}{TA_{i,t-1}} + \gamma_{2,j,t} \frac{\Delta S_{i,t}}{TA_{i,t-1}} + \gamma_{3,j,t} \frac{PPE_{i,t}}{TA_{i,t-1}} + \zeta_{i,j.t}, \quad (3)$$

where ΔS is the change in annual sales and *PPE* is property plant and equipment. We perform the above regression over the prior ten-years. We estimate the regression for each industry (defined as three-digit SIC code), indexed by j for fiscal years 1990 through 2005. We retrieve the coefficient estimates and then obtain firm-level discretionary accruals (*DA*) as follows (Dechow, Sloan, and Sweeney, 1995):

$$\frac{\overline{ACC}_{i,t}}{TA_{i,t-1}} = \hat{\gamma}_{0,j,t} + \hat{\gamma}_{1,j,t} \frac{1}{TA_{i,t-1}} + \hat{\gamma}_{2,j,t} \left(\frac{\Delta S_{i,t}}{TA_{i,t-1}} - \frac{\Delta RC_{i,t}}{TA_{i,t-1}} \right) + \hat{\gamma}_{3,j,t} \frac{PPE_{i,t}}{TA_{i,t-1}}, \text{ where} \quad (4)$$

$$DA_{i,t} = \left| \frac{ACC_{i,t}}{TA_{i,t-1}} - \frac{\overline{ACC}_{i,t}}{TA_{i,t-1}} \right|. \quad (5)$$

3.2. Debt facility data

We collect data on the characteristics of the loan facilities for Compustat firms from Dealscan, a dataset created by Loan Pricing Corporation (LPC). This database

[9] We use adjusted returns and earnings in our main estimation of the Basu's model. In the robustness section we discuss the result of the similar regressions using raw returns.

[10] In the robustness section we discuss estimates from firm-level regressions. These firm-level estimates are restricted to firms with at least ten firm-year observations

includes items such as bond covenant type, maturity structure, size, costs (such as all-in drawn spreads, upfront and utilization fees, etc), credit rating, number of lenders, and issue date for all the loan facilities. Dealscan identifies each credit facility by company name and ticker. We hand match these facilities to the firms in Compustat—thus creating a comprehensive dataset of loan facilities dating back to 1994. We develop our main results with the sample of 1994-2004 as Dealscan's coverage of covenants embedded in smaller size bank loans prior to 1993 is sparse.[11]

3.2.1. Covenant Indicators

LPC Dealscan provides indicators for the presence of twenty-four bond covenants. A subset of these covenants is described in the appendix.[12] As the exact nature of individual covenants can be quite intricate, a valid continuous measure, reflecting the details of each covenant is unrealistic. We therefore restrict our measure to be an indicator variable representing the presence of at least one covenant from a set of covenants in the loan contract, as described below. The LPC dataset is organized at the loan facility level. Because the analysis in this paper is at the firm level, our covenant indicator variables are set to one if a firm has one facility in a given fiscal year of the given covenant type.

To focus on the use of accounting-based covenants, we distinguish between those covenants whose violation depends on attaining a specific accounting-based benchmark from those that do not. We denote the former as "accounting-based covenants" and the latter as "other covenants." Other covenants include sweeps and the requirement that the loan be secured. These covenants generally have no explicit accounting-based

[11] Dichev and Skinner (2002) limit their sample to post-1994 sample due to biases in reporting covenants in LPC prior to that year.

[12] In the appendix we list the eighteen most common covenants. In addition to these, there are the following (in brackets rate of occurrence as a percent of all covenants): maximum loan value (0.05%), percent excess cash flow (0.21%), percent net income (1.07%), required lenders (35.6%), term changes (32.3%), collateral release (18.95%), investment basket (0.64%). We differ from Bradley and Roberts (2004) because we seek to classify covenants according to their use of accounting information.

component. For example debt issuance sweeps require repayment of principle from a portion of the proceeds of the new debt issuance. Our hypotheses concern the presence of accounting-based covenants. We do not develop specific predictions with regard to the relation between the presence of non-accounting based covenants and accounting quality. Instead as part of our robustness tests we include indicators for the presence of "other covenants" in our model, in the event that such covenants act as correlated omitted variables and thereby affect our inferences on the relation between accounting-based covenants and accounting quality. We discuss these results as part of our robustness checks.

Accounting-based-covenant indicator. Our goal in developing an accounting covenant indicator is to provide a measure for whether or not the violation of the firm's bond covenants depends on financial accounting outcomes. Covenants of this type include coverage ratios, leverage ratios, current ratios and net worth-based benchmarks. We distinguish between covenants whose benchmark depends on earnings or balance sheet measures ("E&B covenants" defined in I.B of the appendix) from those whose benchmark depends on an approximation of operating cash flow (EBITDA-based covenants" defined I.A in the appendix). EBITDA-based-covenant benchmarks depend on current accrual choices such as receivables and accrued liabilities. However, they are immune to depreciation and amortization choices. Creating separate categories for these covenant types allows us to examine whether accounting quality is less critical when lenders and borrowers employ cash-flow-based covenants.

3.2.2. Covenant-Slack Measures

We compute covenant slack for current-ratio, net-worth, and tangible-net-worth covenants following the method of Dichev and Skinner (2002). For example, for each facility, *f*, the current-ratio-covenant-slack measure is computed as

$$\ln\left(\frac{\text{current ratio}_{f,t-1}}{\text{covenant-current ratio}_{f,t}}\right), \tag{6}$$

Where the *current ratio*$_{f,t-1}$ is computed based on the firm's end of year *t-1* financial statements data taken from COMPUSTAT, and *covenant-current ratio*$_{f,t}$ is the covenant-current-ratio benchmark for a loan facility originated in year *t* obtained from Dealscan. We then value weight this measure across all facilities with a current ratio covenant in year *t*. Value weighting is based on the loan amount. Computation of net-worth-covenant slack and tangible-net-worth-covenant slack for each firm year is done in a similar way.[13]

3.3. Firm-Characteristic-Control Variables

Malitz (1986) and Begley (1994) find that highly levered firms are more likely to include restrictive covenants in public debt issues. We thus control for the leverage of the company in our regressions. Book leverage is defined as shareholders' equity to total assets at the end of the fiscal year. Shareholders' equity includes the deferred tax liability and convertible debt but excludes preferred stock.[14] This approach follows Fama and French (1997). In our two-stage least squares estimation we instrument firm leverage by the average leverage of other firms in the same three-digit-SIC code, to reduce endogeneity associated with this variable. We include a measure of firm age, because Baker and Wurgler (2002) find that it is related to leverage. We define firm age as the difference between the current fiscal year and the year when the firm has first appeared on the CRSP tapes. Leverage and the nature of covenants are also related to asset tangibility (Smith and Warner, 1979 and Smith and Watts, 1992). We define asset tangibility as plant, property, and equipment divided by total assets and include it as an independent variable. We also include the firm's market-to-book ratio as a proxy for the

[13] Compustat data definitions are in Table 1.
[14] Please see Table 1 for details.

importance of growth options. Kahan and Yermack (1998) and Nash, Netter, Poulsen (2003) examine the relation between a firm's growth opportunities and the choice of covenants in public debt. Both studies find that high growth firms are less likely to include restrictive covenants, suggesting that the benefits of future flexibility outweigh the agency benefit of including covenants.

Begley (1994) finds that the firm's risk of financial distress is negatively related to the use of covenants. We control for the risk of financial distress in four different ways. First, we control for the long-term credit rating, assigned to the company by Standard & Poor's. Second, we control for the volatility of daily returns from the prior fiscal year because of the relation between volatility and default risk (Hillegeist et al., 2004). Third, we include a measure of current profitability. It is defined as EBITDA (Compustat item #13) divided by total assets as of the current fiscal year. Finally, we control for firm size.

IV. Empirical Results

4.1. Univariate Results

Table 2 and Table 3 present univariate results. Our analysis excludes financial companies and regulated utilities, as the debt financing patterns of these firms differs substantially from other companies. We start with the LPC Dealscan set of loans matched to Compustat. Upon completing the match, we aggregate our data at the firm-year level. The merged sample contains a total of 12,393 firm-years for some 4,539 companies for the period 1994 through 2004. We then impose the requirements of availability of all experimental and control variables, including unsigned discretionary accruals and asymmetric timeliness measures. That leaves 6,161 firm-year observations,

representing 2,530 firms. The latter represent 24% of the total corporate book assets for non-financial and non-regulated companies in Compustat as of 2003.[15]

In Table 2 we tabulate key variables for the entire sample and the sample of firms with accounting covenants. These tabulations show that firms with accounting covenants have lower market-to-book ratios, are less profitable, have on average 551 million US$ less in total assets (exp(6.795)-exp(5.836)), are on average seven years younger, have lower Altman (1968) Z score, have more volatile stock returns, are less likely to have Standard & Poor's long-term credit ratings (33% of the sample populations vs. 47% otherwise), are less likely to have a credit rank attached to their bank loan facility, have a greater number of facilities extended per year, have debt facilities priced at about 55 basis points higher than otherwise, issue significantly higher amount of debt as a share of their total assets, that are more often secured (63.6% of the sample population versus 19.8% otherwise). Overall firms whose debt has accounting covenants appear to be more volatile companies with greater default risk, and less tangible assets.

Results in Table 2 also show that those firms whose debt contains accounting covenants, have different asymmetric timeliness of loss and gain recognition. However, the results are contradictory and thus the interpretation is unclear. For example, based on the Ball and Shivakumar (2006) measure, firms with accounting-based covenants have higher magnitude of the α_3 coefficient (i.e. are more asymmetrically timely in recognizing their losses). This result suggests that asymmetric timeliness aids the efficacy of accounting-based covenants. This pattern is not corroborated when one

[15] We start with 57,275 loan facilities in LPC Dealscan between 1994-2004, representing 35,000 unique firm-years and 18,373 unique firms. We next exclude any firms that are in the financial industry (SIC code header 6) or in regulated industry (SIC code headers 48 and 49). That results into a total of 42,490 facilities, or 25,552 firm-years, or 13,771 firms, indicative of the large number of facilities extended to a small number of financial and regulated firms. We hand match the residual companies to Compustat CUSIP identifiers based on the names and the provided tickers (if available) in the LPC Dealscan database. Such hand-matching is required as oftentimes the provided tickers change through time or for a subset of the companies no ticker is provided. Upon matching to COMPUSTAT, we obtain a total of 21,489 facilities, representing a total of 12,393 firm-year pairs that correspond to a total of 4,539 firms, as identified by their CUSIP. Our dataset is substantially larger than others. For example, Bharath et al (2004) obtain a dataset of 7,334 facilities for some 3,081 firms over 1988-2001, a period largely overlapping with ours.

compares the measure of timely loss recognition based on the market model of Basu (1997), β_3. Unsigned discretionary accruals are on average higher for firms with debt that contain accounting covenants.[16] Given the other significant differences between firms whose debt uses accounting covenants and those that do not, these univariate accounting quality results should be viewed with caution.

We next examine the correlations among the main bond covenant measures. We start with Panel A in Table 3, which displays the correlations among the bond covenant indicator variables and value-weighted maturity. All covenants appear to be significantly correlated among themselves, suggesting that covenants are complements rather than substitutes. Secured debt is seen when accounting covenants are present in debt agreements about 42.1%. Other covenants (sweeps) are more often seen when accounting covenants are present. The use of EBITDA-based and other accounting covenants is also highly correlated at 60.7%. The presence of accounting covenants is not significantly associated with the maturity of debt. The presence of sweeps or event-triggered covenants is associated with longer maturity as indicated by the 19.5% statistically significant correlation.

According to Panel B of Table 3, more timely loss recognition (α_3) is positively associated with accounting-based covenants. This result is not corroborated when we examine timely loss recognition based on β_3 in Basu's (1997) market model which is associated with reduced use of bond covenants. Contrary to our hypothesis, higher unsigned discretionary accruals (indicative of low quality of accounting reporting) are associated with the presence of accounting covenants (statistically significant 6.71% pair-wise correlation). These results are consistent with the Wilcoxon tests in Table 2.

[16] All of the above-examined firm characteristics have statistically significantly different means across the samples of firms with and without accounting covenants in their debt agreements, as judged by a Wilcoxon non-parametric test of equality of means (significance at 1% level).

The univariate results on the relation between unsigned discretionary accruals and the timeliness of loss recognition measures suggest these measures are not generally capturing the same underlying construct. High discretionary accruals are associated with high timely loss recognition based on Ball and Shivakumar's (2006) model measure α_3 which runs counter to our expectations firms with better quality of accounting reporting to be more timely in the recognition of losses (statistically significant positive correlation of 7.49%). The pair-wise correlation between α_3 and β_3 shows that they are statistically significantly negatively correlated at -9.7%. One way to view these results is that each of these measures focuses on a distinct aspect of accounting quality or timeliness.

We now turn to an examination of the cross-correlations among the main control variables (Table 3, panel C). We note that signs of all correlations of book leverage with other firm characteristics have the expected signs based on prior capital structure studies. Most of the correlations are below 25% and above -25%. However, in some cases the correlations are outside of that range. The correlation between return volatility and the logarithm of total assets is -52.7%, between total assets and firm age is 48.7%. As the presence of multicollinearity among independent variables could lead to biased coefficient estimates, coefficients on size, age, and return volatility in subsequent tests should be interpreted with caution.

4.2. Multivariate Results

We aggregate the bank loan data from LPC at the fiscal-year level for each firm. Companies can have a number of facilities extended in any particular fiscal year and treating each as an independent observation can bias our standard errors upward. Therefore we proceed with a firm-year level panel. In Table 4 we examine the relation between the propensity to include accounting covenants and quality of accounting reporting (Hypothesis 1). The potential joint determination of accounting ratio covenants

and firm traits raises endogeneity concerns. To address these concerns, we undertake two strategies. First, we use firm characteristics from the year prior to the origination of the debt facility. Second, we use a two-stage least squares (2SLS) estimation framework, where we treat leverage as endogenous. We instrument leverage as the average leverage of other companies in the same three-digit SIC code industry.

In Panel A of Table 4 we present the regression results of a two-stage least squares probit model using the unsigned discretionary accruals as our main experimental variable. Because the probit regression specification is a non-linear function, the table presents estimates of the marginal impact of each coefficient (i.e. the regression slope), evaluated at the mean of the covariates, on the probability of including a covenant. We begin with the slope on the market-to-book ratio. In all three specifications the coefficient, is significant. However it is negative, which is not consistent with the finding of both Bradley and Roberts (2004) and Billett et al. (2006). The relation between measures that characterize the financial condition of a firm such as firm size, tangibility, profitability on one side and the presence of covenants on the other is generally as expected given prior agency theoretic literature, (e.g. Myers (1977) and Smith and Warner (1979)) and is consistent with the empirical literature (see Malitz (1986)): younger firms, with low asset tangibility, smaller size, or lower credit rating are expected to have accounting covenants more often. We interpret these variables as measuring the extent of the potential conflicts between shareholders and bondholders interests. For example, as firms have more risk of bankruptcy, the problems of underinvestment and liquidating dividends become more pronounced. The positive coefficient on profitability runs counter to this reasoning given more profitable companies are less likely to face financial distress. As expected, book leverage is associated with higher propensity to include accounting-based covenants. Firms with more facilities in a given year are also

more likely to employ accounting-based covenants suggesting economies of scale in negotiating these provisions, but also consistent with more leverage leading to greater use of covenants. We further control for the credit spread following Bradley and Roberts (2004). We define the credit spread as the average difference between AAA and BAA rated corporate bonds. We find that this variable is not significant.

We now turn to our analysis of the variable of interest, the impact of unsigned-discretionary accruals on the likelihood to include accounting covenants. Higher accounting discretion is associated with less frequent use of accounting covenants, as evidenced by the negative coefficient on absolute discretionary accruals in model 1. This coefficient is statistically significant for the EBITDA-based covenants (-0.828, t-statistic = -3.66). However, this significance is not corroborated by the other specifications. This result suggests that accounting discretion is likely to have more impact on earnings before interest taxes and depreciation. The economic effect of accounting discretion is important: a one percent increase in the unsigned discretionary accruals from their mean value would lead to a 0.828% decrease in the likelihood of having income-based covenants.[17]

We estimate the effects of asymmetric timeliness in Panel B of Table 4. We present results based on the measures of timeliness of loss recognition in Basu (1997) and Ball and Shivakumar (2006). For brevity, we do not report the control variable estimates, which are the similar to those in Panel A. We first display the results of the model using the timeliness measures from Basu's (1997) model. The results are mixed. The estimates of the coefficient β_3 are positive in all specification but are statistically significant only in

[17] This result is robust to various specifications. In further robustness checks, we include additional control variables, such as loan-specific characteristics (performance pricing dummy) and firm-specific traits (asset maturity): our results remain unchanged. Our findings on these additional independent variables are in line with the prior empirical literature. We obtain a statistically significant negative coefficient on Altman-Z as in Billett et al. (2006). Performance pricing or high economy-wide corporate credit spreads are statistically significantly associated with higher likelihood of accounting-based covenants, in line with the findings of Bradley and Roberts (2004).

models 1 and 2. They are of limited economic significance: for example, based on model 3, one percent increase in the asymmetric timeliness of earnings from its mean value would lead to a 0.14% decrease in the likelihood of having accounting-based covenants. The effect of timely gain recognition on inclusion of accounting covenants, represented by β_2, is positive and is significantly related to the likelihood of including covenants in models 2 and 3. We note that our endogeneity concerns are substantiated only to a limited extent, as the Wald test rejects the null hypothesis of exogeneity of book leverage only for model 1.[18]

Results based upon the Ball and Shivakumar (2006) measure of timeliness are weak. Both timely gain and loss recognition are statistically insignificant and economically less important determinants of the propensity to include accounting-based covenants as compared to the results of Basu's (1997) measures. We conclude that the timeliness of loss recognition appears to be less important determinant of the inclusion of accounting covenants in debt agreements.

Table 5 displays results from an investigation of the relation between the restrictiveness of the bond covenants and the corresponding measures of accounting quality. We focus on the current-ratio, net-worth and tangible-net-worth covenants, because these ratios are most clearly defined. Two methodological features should be noted. First, we conduct our analysis at the firm-year level, as opposed to the facility level. One advantage of this approach is that it mitigates the correlation in residuals, as facility-level observations for the same company may not be independent. Second, directly estimating the relation between the distance measures and accounting reporting quality would produce inconsistent estimates as omitting the inverse Mill's ratio would lead to specification error (Greene, 2002). Therefore, we use a two-stage Heckman

[18] The Wald test of exogeneity in discrete dependent variable models, such as probit, is similar to the Hausman specification test in instrumental variable estimation. See Greene (2002) and Newey (1987) for further details.

(1979) estimation framework to control for the decision to use an accounting-based covenant. In the first stage we predict the incidence of an accounting-based covenant using all variables from Table 4. In the second stage, we examine the relation between accounting quality and covenant slack. The second stage estimation includes the inverse Mills ratio computed in the first stage as well as market-to-book, tangibility, profitability, firm size, return volatility, and credit rating as control variables. These control variables are consistent with those identified by Beatty, Weber, and Yu (2006).

In Panel A of Table 5 we study the relation between the restrictiveness of the covenants and the absolute discretionary accruals. The table presents three different specifications. Each has two columns; the first one displays the first-stage estimates, while the second shows the selection equation estimates (i.e., the second-stage estimates). Certain variables in the selection equations such as market-to-book ratio, firm size, leverage, stock return volatility and S&P credit rating are negatively associated with the presence of current ratio, net-worth or tangible net worth covenants. They also preserve their statistical significance in all three selection equations. Profitability is positively associated with the presence of the three covenants in the selection equations in Panel A. Other variables, such as the corporate credit spread, asset tangibility, firm age and unsigned discretionary accruals, change signs across selection equations in Panel A. We attribute this change to the fact that these probit models attempt to predict the presence of a specific type of accounting covenant, as opposed to the presence of accounting-based covenants in general. Overall the first-stage models are significant as indicated by their chi-squared statistics. The reported chi-squared statistics are from a Wald test of the joint significance of all regression coefficients in the regression.

We now turn to analysis of the second-stage equations in Panel A. For both current ratio and net worth covenant slack regressions the inverse Mills ratios indicate the

presence of selection bias. In all of the models high absolute discretionary accruals are associated with lower covenant slack. These associated are statistically significant except for the net-worth covenant. These results are consistent with the argument that increased accounting discretion (as measure by absolute discretionary accruals) is associated with reduced slack.

We now turn to the Panel B, where we study the association between covenants slack and timeliness of loss recognition. We focus our analysis on the main equations. The inverse Mills ratio indicator is significant in models 1 and 2, for both measures of timely loss recognition. Note that all models specifications are significant, as judged by the p-values of their chi-squared statistics. The measures of timely gain recognition, β_2 is negative and significant in the current-ratio covenant slack regressions. The coefficient is negative, which is opposite to our conjecture that more timely gain recognition is associated with higher slack. The timely loss recognition coefficient β_3 is significant in the net-worth covenant second stage equation. The coefficient is negative, indicating that more timely loss recognition is associated with lower net-worth covenant slack. Overall these results do not support the belief that timely recognition is a substitute for covenant slack.

Our results are more consistent when we study the relation between Ball and Shivakumar (2006) measures of timeliness of losses and gains recognition in relation to covenant slack. In all three models timely gain recognition is associated with higher covenant slack. However this association is statistically significant only for current-ratio slack. Similarly, timely loss recognition is positively related to covenant slack in all models. However, it is statistically significant only for tangible-net worth covenant slack. In sum, we conclude from these results that the impact of asymmetric timeliness

and on the covenant slack in account-based debt covenants is not uniform and consequently not a robust determinant.

V. Robustness Checks

We subject the above probit models to alternative specifications. As unconditional probit models with fixed effects are biased (Guilkey and Murphy, 1993) we have attempted two alternative estimation strategies. While neither is perfect, they both yield the same results. First, we estimate a random effects probit model, where we control for time effects not captured in the set of controls above thus addressing a potential omitted variable concern. Second, we consider a two-stage least squares linear probability model where we treat leverage as endogenous. Our results regarding the impact of unsigned discretionary accruals, and our timeliness measures are unchanged.

We also examine the role of facility factors on the choice of the decision to include accounting based covenants. Among these we include a syndication dummy, a dummy for the presence of other covenants (sweeps), a dummy for secured debt, the total debt amount borrowed to total assets, and the value-weighted maturity of all loan facilities within a given year. While these factors generally have economically significant relation to the propensity to include accounting covenants, they do not change our results regarding the role of unsigned discretionary accruals or the role of timeliness measures. As these factors are likely to be jointly determined with decision to use accounting covenants, we do not interpret these coefficients as an indicator of causality. Prior research suggests that syndication increases renegotiation and monitoring costs and would therefore be negatively related to the use of covenants (El-Gazzar and Pastena, 1990). However, we find that syndication is significantly positively associated with use of accounting-based covenants. Note that this result is conditional on the existence of other covenants (an alternative proxy for renegotiation cost), as an indicator for these is

included in the model. The coefficient on other covenants is significantly positive suggesting that other covenants and accounting covenants are complements rather than substitutes. We expect that a larger amount of borrowing relative to the outstanding assets of the firm would be positively associated with the propensity to include accounting covenants, as increased borrowing can increase the volatility of the firm's financial position. Indeed we find that larger total loan amount is associated with higher likelihood of including accounting covenants (this relation remains unchanged when one examines E&B-based versus EBITDA-based covenants) contrary to the findings of Bradley and Roberts (2004). We attribute that difference to the differing definitions of accounting-based covenants in our study and financial covenants in the latter. We further document that longer maturity is associated with lower propensity to include accounting covenants in debt contracts, in line with the results of Billett et al. (2006). Finally, security and presence of sweeps in debt contracts appear to be complements with accounting-based covenants.

We also recompute accruals using the balance sheet definition in Sloan (1996) and in Ball and Shivakumar (2005),

$$ACC_{i,t} = \Delta CA_{i,t} - \Delta Cash_{i,t} - \left(\Delta CL_{i,t} - \Delta STD_{i,t} - \Delta TP_{i,t}\right) - Dep_{i,t}, \quad (7)$$

where $ACC_{i,t}$ is the accruals of firm *i* in year *t*, $\Delta CA_{i,t}$ is the change of current liabilities (Compustat item #4), $\Delta Cash_{i,t}$ is the change in cash/ cash equivalents (Compustat item #1), $\Delta CL_{i,t}$ is the change in current liabilities (Compustat item 5), $\Delta STD_{i,t}$ is the change in debt included in current liabilities (Compustat item #34), $\Delta TP_{i,t}$ is the change in income taxes payable (Compustat item #71), and $Dep_{i,t}$ is depreciation and amortization expense (Compustat item #14). Our results are qualitatively similar when using the alternative definition of accruals.

We further consider the firm-specific asymmetric timeliness estimates of the Basu (1997) and Ball and Shivakumar (2006) as opposed to the industry-specific ones presented above. To obtain more reliable measures of timely loss recognition from firm-specific time-series regressions, this estimation is restricted to borrowers who have a minimum of ten observations in the immediately preceding ten years. The results of that estimation with regard to the coefficients on the timeliness measures are qualitatively similar to those presented above.

Sufi (2006) finds that firms in Dealscan without firm rating by either Moody's or Standard & Poor's see a noticeable change in their financing policy when they receive a bank rating. To control for this effect, we substitute the S&P long-term credit rating in our regressions with the highest credit rating among the facilities extended in a given fiscal year for each firm. Using that proxy for credit risk instead of the firm-level proxy does not qualitatively change our results.

In our main discussion, we aggregate observations at the firm-year level. We further performed a facility-level analysis similar to Beatty, Weber and Yu (2006) and Dichev and Skinner (2002). As facilities are often times included into packages our analysis at the facility level analysis has the potential of introducing autocorrelation in the residuals. Consequently, we cluster-adjust our standard errors at the firm level to address autocorrelation of residuals concern. Our results are robust to that battery of robustness checks.

VI. Conclusions

To understand how greater timeliness of earnings and limits on management discretion in the computation of earnings relate to the efficacy of accounting-based covenants, we examine how these characteristic affect the propensity to use accounting-

based covenants and to covenant slack. We argue that if these characteristics enhance the ability of accounting-based covenants to limit debt-holder/shareholder conflicts, we should see greater use of accounting-based covenants and greater covenant slack when earnings are more timely and management discretion is circumscribed.

Our results do not support the belief these characteristics are associated with covenant effectiveness. We are unable to find a consistent relation between discretionary accruals and the use of accounting-based covenants or covenant slack. Similarly we find no consistent relation between timeliness of earnings (or asymmetric timeliness of earnings) and the use of accounting-based covenants or covenant slack.

These results suggest a gap in the chain of causality that relates asymmetric timeliness of earnings to debt-contracting efficiency. While studies indicate asymmetric timeliness is associated with reduced borrowing costs, these concepts are presumably linked by the ability of asymmetric timeliness to increase the efficacy of accounting-based covenants. Yet our results indicate that use of accounting-based covenants is not more likely when asymmetric timeliness is increased. If accounting covenants are not being employed by asymmetric timely firms it is unclear how the potential benefits of timeliness are harvested by lenders and borrowers.

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Table 1. Variable Definitions

Panel A: Covenant-Related Variables

Variable Name	Definition
EBITDA-based accounting covenants	Indicator variable. For each facility, we assign a value of one if at least one of the following covenants is present, zero if none of these covenants are present: Fixed Charge Coverage, Debt Service Coverage, Interest Coverage, Cash Interest Coverage, Debt To Cash Flow, Senior Debt to Cash Flow. For description of each of these covenants please refer to the appendix. We then sum across all facilities for each firm within a given year. If the result is greater than one, we assign the EBITDA-based accounting covenants indicator variable a value of one for that firm year and zero otherwise.
B&E covenants	Indicator variable. For each facility, we assign a value of one if at least one of the following covenants is present, zero if none of these covenants are present: Current Ratio, Debt to Tangible Net Worth, Tangible Net Worth, Net Worth, Leverage Ratio, Debt to Equity Ratio, and Dividend Restriction. For concise description of each of these covenants please refer to the appendix. We then sum across all facilities for each firm within a given year. If the result is greater than one, we assign the B&E covenants indicator variable a value of one for that firm year and zero otherwise. We assume that the dividend restriction is not present when missing (and have checked the validity of this assumption by reviewing tear sheets provided by LPC Dealscan).
All Accounting covenants	Indicator variable equal the maximum of EBITDA-based Accounting Covenants and B&E Covenants.
Other covenants (Sweeps)	Indicator variable that takes on the value of one if one of the firm's loan facilities within a given year contains at least one sweep provision and value of zero otherwise. Sweep provisions are defined in the appendix.
Current-ratio-covenant slack	We define the restrictiveness of the current ratio covenant as the log ratio of the current ratio as of the end of the fiscal quarter prior to facility origination to the current ratio required in the covenant: $Ln\left(Current\ Ratio_{t-1}/Covenant\ Current\ Ratio_{t}\right)$. We value-weight this measure across facilities within the fiscal year. We Winsorize the ratio at 1% in both tails of its sample distribution. Current ratio is defined as current Assets (Compustat data item #40) divided by Current Liabilities (Compustat data item #49) from the CRSP-Compustat Industrial Quarterly file. The resulting variable is Winsorized at 1% in both tails of the distribution.
Net-worth-covenant slack	We define the restrictiveness of the net worth covenant as the log ratio of the net worth as of the end of the fiscal quarter prior to facility origination to the net worth required in the covenant: $Ln\left(Net\ Worth_{t-1}/Covenant\ Net\ Worth_{t}\right)$. We value-weight this measure across facilities within the fiscal year. We Winsorize the ratio at 1% in both tails of its sample distribution. Net worth is defined as stockholders' equity (Compustat quarterly item #60). The resulting variables are Winsorized at 1% in both tails of the distribution.
Tangible-net-worth-covenant slack	We define the restrictiveness of the tangible net worth covenant as the log-ratio of the tangible net worth as of the end of the fiscal quarter prior to facility origination to the tangible net worth required in the covenant: $Ln\left(Tangible\ Net\ Worth_{t-1}/Covenant\ Tangible\ Net\ Worth_{t}\right)$. We value-weight this measure across facilities within the fiscal year. We Winsorize the ratio at 1% in both tails of its sample distribution. Tangible net worth is defined as net worth less goodwill (Compustat quarterly item #234) less intangibles (Compustat quarterly item #235).

The source for all the above variables is the LPC Database (Dealscan), 1994-2004.

Panel B: Loan Characteristics

Variable Name	Definition
Total loan amount	The natural logarithm of the ratio of the amount of loan facilities extended within a given fiscal year scaled by total assets of the firm for the previous fiscal year.
Facilities per year	Total number of loan facilities granted within a given fiscal year.
Maturity	Value-weighted average of the log of the facility maturities within each fiscal year.
Secured	An indicator variable equal to one if at least one of the firm's loan facilities is secured with collateral and zero otherwise.
All-in Drawn Spread	Mark-up over LIBOR that is paid by the borrower on all drawn lines of credit.
Syndication	An indicator variable set to one if at least one of the firm's loan facilities originated in a given fiscal year is syndicated and zero otherwise.

The source for all the above variables is the LPC Database (Dealscan), 1994-2004.

Panel C: Accounting Quality Variables

Variable Name	Definition
Basu (1997) measure of accounting conservatism	We retrieve β_2 and β_3 from a regression of earnings/price on stock returns, for each 3-digic SIC code industry for each year: $EP_{i,t} = \beta_{0,j} + \beta_{1,j} D_{R_{i,t}<0} + \beta_{2,j} R_{i,t} + \beta_{3,j} D_{R_{i,t}<0} * R_{i,t} + \xi_{i,t}$, where i indexes firms, t indexes years, $E_{i,t}$ is the diluted EPS including extraordinary items (Compustat data item #169), and $P_{i,t}$ is close price at the end of the fiscal year (Compustat data item #199). The ratio $EP_{i,t}$ is adjusted for the average such ratio in the corresponding year. $R_{i,t}$ is market-adjusted return, measured as returns over the 12 month period ending 3 months after the fiscal year-end and adjusted with the value-weighted market return for the same period (including distributions). D is an indicator function that is one if the market-adjusted return is negative, and zero otherwise. For any given year, t, we estimate the regression for ten years of data, [t-10,t-1] for each 3-digit SIC code industry. We Winsorize the variables at 1% in each tail of the distribution. We assign the measure to all borrowers in the same industry.
Ball and Shivakumar (2005) measure of accounting conservatism	For each 3-dgit SIC code we estimate α_2 and α_3 from a piecewise-linear regression of accruals on cash flows, $\frac{ACC_{i,t}}{TA_{i,t-1}} = \alpha_{0,j} + \alpha_{1,j} D_{OCF_{i,t}<0} + \alpha_{2,j} \frac{OCF_{i,t}}{TA_{i,t-1}} + \alpha_{3,j} \frac{OCF_{i,t}}{TA_{i,t-1}} * D_{OCF_{i,t}<0} + \varepsilon_{i,t}$, where i indexes the firm, j indexes 3-digit SIC code industry, and t indexes the year. OCF is operating cash flow (data item #308) of firm *I* in year *t*. D is an indicator variable taking the value of one if the firm's operating cash flow is negative, zero otherwise. ACC is the accruals of firm *I* in year *t*, measured as earnings on the statement of cash flows (Compustat item #123) less operating cash flow (Compustat item #308). Both accruals and cash flow variables are standardized by the lagged total assets. We Winsorize each of the above data items at the 1% and 99% percentile of the distribution for both deflated accruals and cash flow variables prior to running the regression (1). For any given year, t, we estimate regression for the preceding ten years, [t-10,t-1] for each 3-digit SIC code industry. We assign the same measure to all borrowers in the industry.
Unsigned Discretionary Accruals	We use the Jones (1991) model in order to estimate discretionary accruals. We perform the regression $\frac{ACC_{i,t}}{TA_{i,t-1}} = \gamma_{1,j,t} \frac{1}{TA_{i,t-1}} + \gamma_{2,j,t} \frac{\Delta S_{i,t}}{TA_{i,t-1}} + \gamma_{3,j,t} \frac{PPE_{i,t}}{TA_{i,t-1}} + \zeta_{i,j,t}$. We define accruals as earnings before extraordinary items (Compustat item #123) less cash flow from operations (Compustat item #308). $TA_{i,t-1}$ is lagged total assets (Compustat item #12), $\Delta S_{i,t}$ is change in sales (#12), and $PPE_{i,t}$ is property, plant, and equipment (Compustat item #7). We Winsorize all regression variables at 1% in each tail of the distribution. We perform the above regression over a ten-year window, e.g. in 1990, we would employ the time window from 1980 through 1989. We estimate the regression for each industry defined as three-digit SIC code and indexed by *j*. We perform such regressions for fiscal years 1990 through 2005. We retrieve the coefficient estimates and obtain the discretionary accruals as $\frac{\overline{ACC}_{i,t}}{TA_{i,t-1}} = \hat{\gamma}_{0,j,t} + \hat{\gamma}_{1,j,t} \frac{1}{TA_{i,t-1}} + \hat{\gamma}_{2,j,t} \left(\frac{\Delta S_{i,t}}{TA_{i,t-1}} - \frac{\Delta RC_{i,t}}{TA_{i,t-1}} \right) + \hat{\gamma}_{3,j,t} \frac{PPE_{i,t}}{TA_{i,t-1}}$, $DA_{i,t} = \left| \frac{ACC_{i,t}}{TA_{i,t-1}} - \frac{\overline{ACC}_{i,t}}{TA_{i,t-1}} \right|$, where $\Delta RC_{i,t}$ is the change in receivables (Compustat item # 151) and $DA_{i,t}$ is the unsigned discretionary accruals from the modified Jones model in Dechow, Sloan, and Sweeny (1995). To increase the reliability of the estimates we require at least ten observations within each 3-digit SIC code industry for a specific ten-year window. If there are not enough observations for that particular 3-digit SIC code, we then use the similarly-computed discretionary accruals for the 2-digit SIC code, subject to the ten observations restriction. We assign the measure to all borrowers in the same industry.

The source for all the above variables is the CRSP/ Compustat Merged Dataset, 1980-2005.

Panel D: Control Variables

Variable Name	Definition
Stock return volatility	Defined as the standard deviation of the daily holding period return for the fiscal year.
Book leverage	Book debt to total assets (Compustat item #6) at the end of the current fiscal year. The variable is further Winsorized at 1% in both tails of the distribution. Total assets (Compustat item #6) – total liabilities (Compustat item #181)– preferred stock (Compustat item #10) + deferred taxes (Compustat item #35) + convertible debt (Compustat item #79) as of the end of the current fiscal year; if preferred stock is missing, then I subtract the redemption value of preferred stock (Compustat item #56). If redemption value is also missing then I subtract the carrying value (Compustat item #130). In this computation, if deferred taxes are recorded as missing or combined with other items, I record them as 0. Book debt, defined as total assets (Compustat item #6) – book equity, both as of the end of the current fiscal year.
Credit Spread	Credit Spread is the average annual difference in the yields on BAA and AAA corporate bonds, computed and reported by the Federal Reserve.
Market-to-book	Market value of shareholders' equity to book-value of shareholders' equity, where the components are as of the end of the current fiscal year. The resulting variable is Winsorized at 1% in both tails of the distribution. In defining book equity we equate it to stockholders' equity (#216) minus preferred stock (#10) plus deferred taxes and investment credit (#35). If stockholders' equity is missing, we define book equity as common equity (# 60) plus deferred taxes and investment credits (#35). If common equity is missing we define book equity as total assets (#6) minus total liabilities (#181) minus preferred stock (#10) plus deferred taxes & investment credits (#35). Market value of equity is defined as the product of common shares outstanding (#25) and close price at the end of the fiscal year (#199).
Asset tangibility	Equals net property, plant and equipment (#8) divided by total assets as of the current fiscal year. The resulting variable is Winsorized at 1% in both tails of the distribution.
Profitability	Equals EBITDA (#13) divided by total assets as of the current fiscal year. The resulting variable is Winsorized at 1% in both tails of the distribution.
S&P credit rating	Standard & Poor's long-term credit rating. The variable is coded from 0 through 7: if the rating is missing, we assign a code of zero; the lowest rating category is assigned one; CCC rating category is assigned rating code two; the B rating category is assigned code three; the BB rating category is assigned rating code four; the BBB rating category is assigned rating five; the A category is assigned rating six; and the AA and AAA ratings are assigned a rating category seven.
Firm size	Equals the natural logarithm of total assets (#6) as of the end of the fiscal year. The variable is Winsorized at 1% in both tails of the distribution.
Firm age	Firm age measured as the difference between the current year and the year when the firm has first appeared on the CRSP tape.

The source for all the above variables is the CRSP/ Compustat Merged Datasets at the Annual and Quarterly level, 1980-2005.

Table 2. Loan characteristics and firm accounting reports quality by covenant type.

This table presents univariate statistics for variables used in subsequent tests. Variable definitions are contained in Table 1. Non-indicator variables are Winsorized at 1%. The Wilcoxon rank-sum test examines null hypothesis of equality of the means presented in the "No" and "Yes" columns. The sample period is 1994 to 2004. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, correspondingly.

				Means		
				Accounting Covenants		
Number of observations				2,230	3,931	
	Mean	**Median**	**Std. Dev.**	**No**	**Yes**	**Wilcoxon test p-value**
Credit Spread	84.01%	77.00%	0.25	0.808	0.858	0.00***
Book leverage	54.14%	52.92%	0.25	55.06%	53.63%	0.00***
Market-to-book	1.788	1.393	1.333	1.869	1.742	0.00***
Profitability	0.111	0.129	0.154	0.121	0.105	0.00***
Asset tangibility	0.322	0.254	0.241	0.335	0.315	0.00***
Firm size (logarithm of total assets)	6.183	6.126	1.904	6.795	5.836	0.00***
Firm age	17.0	11.0	16.8	21.59	14.40	0.00***
Altman Z-score	2.347	2.451	2.219	2.49	2.27	0.00***
Stock return volatility	0.037	0.032	0.021	0.033	0.040	0.00***
Percent with S&P credit rating	37.90%	-	-	47.31%	32.56%	0.00***
Percent with facility-level credit rating	44.91%	-	-	55.52%	38.90%	0.00***
Number of facilities	1.65	1.00	1.05	1.41	1.79	0.00***
Maturity	3.37	3.00	2.18	3.44	3.34	0.00***
All-in drawn spread (in basis points)	175.33	150.00	125.81	137.52	192.12	0.00***
Percentage of loan facilities with sole lender, per firm-year	16.25%	-	-	13.01%	18.09%	0.00***
Percentage of syndicated facilities, per firm-year	77.44%	-	-	76.52%	77.96%	0.00***
Logarithm of total loan amount deflated by total assets	-1.39	-1.36	1.19	-1.840	-1.135	0.00***
Percent of loan facilities secured	47.77%	-	-	19.82%	63.62%	0.00***
Current-ratio-covenant slack	0.401	0.373	0.491	1.231	0.399	0.03**
Net-worth-covenant slack	0.290	0.193	0.611	-1.798	0.292	0.09*
Tangible-net-worth-covenant slack	0.441	0.288	0.627	1.746	0.439	0.47
Unsigned Discretionary Accruals	0.074	0.046	0.086	0.066	0.078	0.00***
α_2 (Ball et al. (2006))	-0.448	-0.402	0.204	-0.446	-0.450	0.21
α_3 (Ball et al. (2006))	0.271	0.369	0.522	0.243	0.286	0.00***
β_2 (Basu (1997))	0.006	0.005	0.052	0.005	0.007	0.62
β_3 (Basu (1997))	0.329	0.288	0.201	0.341	0.323	0.00***

Table 3. Correlations

This table presents pair-wise Pearson correlation among key variables in our study. Variable definitions are contained in Table 1. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, correspondingly. Sample period is 1994 to 2004.

Panel A: Correlations among bond covenant measures

	All Accounting Covenants	EBITDA-based	B&E Covenants	Other Covenants	Secured
EBITDA-based	0.685***				
B&E Covenants	0.9384***	0.6071***			
Other Covenants	0.4491***	0.4189***	0.4485***		
Secured	0.4214***	0.2799***	0.4361***	0.2534***	
Maturity	-0.0210	0.0858***	-0.0200	0.1945***	0.004

Panel B: Correlations among key accounting quality measures and accounting covenants

	All Accounting Covenants	β_3(t), Basu (1997)	β_2(t), Basu (1997)	α_3(t), Ball et al (2006)	α_2(t), Ball et al (2006)
β_3(t), Basu (1997)	-0.0444***				
β_2(t), Basu (1997)	0.0253**	-0.2214***			
α_3(t), Ball et al (2006)	0.04***	-0.0973***	-0.1402***		
α_2(t), Ball et al (2006)	-0.01	-0.2262***	-0.013	-0.2323***	
Unsigned Discretionary Accruals	0.0671***	0.013	-0.0443***	0.0749***	-0.0253**

Panel C: Correlations among key firm characteristics

	Book Leverage	Market-to-book	Profitability	Tangibility	Total Assets	Firm Age
Market-to-book	-0.0995***					
Profitability	-0.1606***	0.069***				
Tangibility	0.0384***	-0.1601***	0.1516***			
Total Assets	0.1022***	0.014	0.2884***	0.1364***		
Firm Age	0.0919***	-0.001	0.1191***	0.0231*	0.4867***	
Return Volatility	0.1146***	0.008	-0.4576***	-0.1625***	-0.5266***	-0.3182***

Table 4, Panel A. Discretionary accruals and accounting-based covenants

This table presents results from two-stage least squares (2SLS) probit model estimates for the inclusion of accounting-based covenants on lagged unsigned discretionary accruals and various control variables. We treat leverage as endogenous in our specification and instrument for it with the industry average of book leverage of other companies in the same three-digit industry. The level of analysis is firm-year observations. Variable definitions are contained in Table 1. The regression includes fixed year effects (not reported). Sample period is 1994 to 2004. We exclude the financial industry (SIC code headers 60 through 64) and the regulated utilities (SIC headers 48 and 49). In order to include an observation for a given company-year, we require that all of the independent variables are non-missing, and further that the company-year in point has data on the Basu's (1997) and Ball and Shivakumar's (2006) measures of asymmetric timeliness. The presented estimates are of the marginal effects, evaluated at the means of the independent variables. The absolute value of the t-statistics (in parentheses below the coefficient estimates) is based on robust standard errors. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, correspondingly. The Wald test of exogeneity tests the null hypothesis of no exogeneity of the instrumented variable book leverage.

	EBITDA-based Accounting Covenants	B&E Covenants	All Accounting Covenants
Model	**(1)**	**(2)**	**(3)**
Credit Spread	0.105	-0.0003	0.148
	(0.57)	(0.00)	(0.76)
Market-to-book (t-1)	-0.045**	-0.052***	-0.033**
	(2.43)	(3.25)	(2.00)
Asset tangibility (t-1)	-0.265***	-0.217**	-0.205**
	(3.41)	(2.57)	(2.44)
Profitability (t-1)	2.441***	0.551***	0.783***
	(12.92)	(3.00)	(4.44)
Firm size (t-1)	-0.191***	-0.108***	-0.128***
	(9.84)	(3.77)	(4.68)
Book leverage (t-1)	2.258***	0.124	0.799
	(5.44)	(0.22)	(1.47)
Firm age (t-1)	-0.009***	-0.008***	-0.009***
	(7.53)	(6.79)	(7.60)
Stock return volatility (t-1)	-8.852***	1.321	-0.329
	(6.79)	(0.82)	(0.20)
S&P long-term debt rating (t-1) (higher is better)	-0.055***	-0.083***	-0.078***
	(5.54)	(8.28)	(7.65)
Number of facilities	0.221***	0.289***	0.286***
	(7.25)	(10.49)	(9.17)
Abs(discretionary accruals) (t-1)	-0.828***	-0.252	-0.350
	(3.66)	(1.04)	(1.44)
Number of observations	6,161	6,161	6,161
Chi-squared statistics (p-value)	1,079 (0.00)	838.8 (0.00)	871.3 (0.00)
Wald test of exogeneity	17.8 (0.00)	0.36 (0.54)	2.58 (0.11)

Table 4, Panel B. Accounting timeliness and accounting-based covenants

This table presents results from two-stage least squares (2SLS) probit model estimates for the inclusion of accounting-based covenants on lagged measures of timeliness and various control variables. To conserve space we do not report the coefficients or t-statistics of the control variables. The control variables used are the same as those shown in Table 4 panel A. We treat leverage as endogenous in our specification and instrument for it with the industry average of book leverage of other companies in the same three-digit industry. The level of analysis is firm-year observations. Variable definitions are contained in Table 1. The regression includes fixed year effects (not reported). Sample period is 1994 to 2004. We exclude the financial industry (SIC code headers 60 through 64) and the regulated utilities (SIC headers 48 and 49). In order to include an observation for a given company-year, we require that all of the independent variables are non-missing, and further that the company-year in point has data on the Basu's (1997) and Ball and Shivakumar's (2006) measures of asymmetric timeliness. The presented estimates are of the marginal effects, evaluated at the means of the independent variables. The absolute value of the t-statistics (in parentheses below the coefficient estimates) is based on robust standard errors. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, correspondingly. The Wald test of exogeneity tests the null hypothesis of no exogeneity of the instrumented variable book leverage.

	EBITDA-based Accounting Covenants	B&E Covenants	All Accounting Covenants
Model	(1)	(2)	(3)
Basu (1997) measure of asymmetric timeliness (t-1) based on market-adjusted returns			
β_2(t-1)	0.542	0.806**	0.649*
	(1.60)	(2.29)	(1.84)
β_3(t-1)	0.167*	0.20**	0.143
	(1.72)	(2.06)	(1.45)
Number of observations	6,161	6,161	6,161
Chi-squares statistics (p-value)	1,005.4 (0.00)	846.0 (0.00)	851.6 (0.00)
Wald test of exogeneity (p-value)	12.25 (0.00)	0.03 (0.87)	1.04 (0.31)
Ball and Shivakumar (2006) measure of asymmetric timeliness (t-1)			
α_2(t-1)	0.016	-0.195	-0.145
	(0.15)	(1.62)	(1.55)
α_3(t-1)	-0.049	-0.047	-0.055
	(1.41)	(1.32)	(1.55)
Number of observations	6,161	6,161	6,161
Chi-squares statistics (p-value)	1,086.5	836.0	826.5
Wald test of exogeneity (p-value)	11.9 (0.00)	0.01 (0.93)	1.25 (0.26)

Table 5, Panel A. Covenant slack and absolute discretionary accruals.

This table presents results from the Heckman (1979) two-stage estimation procedure of the impact of absolute discretionary accruals on the covenant slack. The level of analysis is firm-year observations. The dependent variable is Winsorized at 1% in each tail of the distribution. Variable definitions are contained in Table 1. Sample period is 1994 to 2004. We exclude the financial industry (SIC code headers 60 through 64) and the regulated utilities (SIC headers 48 and 49). The absolute value of the t-statistics is presented in parentheses below the coefficient estimates. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, correspondingly. In order to include an observation for a given company-year, we require that all of the independent variables are non-missing, and further that the company-year in point has the Basu's (1997) and Ball and Shivakumar's (2006) measures of asymmetric timeliness.

Variable	Dependent Variable					
	Current-ratio covenant slack		Net-worth covenant slack		Tangible net-worth covenant slack	
Model	(1)		(2)		(3)	
	Selection Equation (1st stage)	**Main Equation (2nd stage)**	**Selection Equation (1st stage)**	**Main Equation (2nd stage)**	**Selection Equation (1st stage)**	**Main Equation (2nd stage)**
Intercept	0.275*	1.792***	-0.649***	-0.57***	0.081	0.301
	(1.76)	(6.41)	(4.67)	(3.13)	(0.65)	(1.66)
Inverse Mills Ratio		-1.156***		0.336***		0.188
		(3.38)		(2.67)		(1.20)
Credit Spread (t-1)	-0.332***		0.317***		-0.267***	
	(3.21)		(3.7)		(3.23)	
Market-to-book (t-1)	-0.049***	0.075***	-0.059***	0.031	-0.031**	0.036***
	(2.76)	(2.78)	(3.49)	(1.59)	(2.32)	(3.05)
Asset tangibility (t-1)	0.283***	-0.826***	-0.438***	0.023	0.112	-0.443***
	(2.96)	(6.11)	(4.86)	(0.22)	(1.37)	(5.93)
Profitability (t-1)	0.858***	-0.448	0.697***	-0.139	0.242*	0.142
	(4.92)	(1.33)	(3.53)	(0.58)	(1.75)	(1.1)
Firm size (t-1)	-0.238***	0.17**	-0.029*	0.057***	-0.101***	-0.004
	(13.86)	(2.34)	(1.93)	(3.46)	(7.37)	(0.21)
Book Leverage (t-1)	-0.262**		-0.27***		-0.694***	
	(2.39)		(2.74)		(7.5)	
Firm Age (t)	0.002		-0.006***		-0.003*	
	(0.84)		(4.09)		(1.75)	
Stock return volatility (t-1)	-2.435*	-2.069	-7.177***	-0.214	5.783***	-0.089
	(1.7)	(1.00)	(4.87)	(0.14)	(5.05)	(0.08)
S&P credit rating (t-1)	-0.038**	0.034	-0.044***	0.010	-0.067***	0.055***
	(2.15)	(1.28)	(3.53)	(0.70)	(4.95)	(3.02)
Number of Facilities (t)	0.057***		0.152***		0.014	
	(2.68)		(8.76)		(0.74)	
Abs(discretionary accruals)(t-1)	0.657**	-0.882**	-0.947***	-0.406	0.476**	-0.41*
	(2.43)	(2.27)	(3.37)	(1.27)	(2.12)	(1.93)
Number of observations	6,161		6,161		6,161	
Chi-squared statistics	342.7		127.6		301.7	
P-value for chi-squared statistics	0.00		0.00		0.00	

Table 5, Panel B. Covenant slack and timeliness – Basu measure

This table presents results from the Heckman (1979) two-stage estimation procedure of the impact of asymmetric timeliness on the covenant slack. The level of analysis is firm-year observations. The dependent variable is Winsorized at 1% in each tail of the distribution. Variable definitions are contained in Table 1. Sample period is 1994 to 2004. We exclude the financial industry (SIC code headers 60 through 64) and the regulated utilities (SIC headers 48 and 49). The absolute value of the t-statistics is presented in parentheses below the coefficient estimates. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, correspondingly. In order to include an observation for a given company-year, we require that all of the independent variables are non-missing, and further that the company-year in point has the Basu's (1997) and Ball and Shivakumar's (2006) measures of asymmetric timeliness.

Variable	Dependent Variable					
	Current-ratio-covenant slack		Net-worth-covenant slack		Tangible Net-worth-covenant slack	
Model	**(1)**		**(2)**		**(3)**	
	Selection Equation (1st stage)	**Main Equation (2nd stage)**	**Selection Equation (1st stage)**	**Main Equation (2nd stage)**	**Selection Equation (1st stage)**	**Main Equation (2nd stage)**
Basu Measures (Market-adjusted Returns)						
Inverse Mills Ratio		-0.632**		0.419***		0.234
		(2.42)		(3.21)		(0.52)
β_2 (t-1)	1.10**	-1.135**	0.136	0.612	1.277***	-0.406
	(2.22)	(2.19)	(0.33)	(1.4)	(3.18)	(0.66)
β_3(t-1)	0.111	-0.109	-0.4***	-0.352***	0.374***	0.072
	(0.87)	(0.89)	(3.54)	(2.78)	(3.64)	(0.39)
Number of observations	6,161		6,161		6,161	
Rho	485.9		170.0		396.5	
Chi-squared statistics	-0.90		0.60		0.37	
P-value for chi-squared statistics	0.00		0.00		0.00	
Ball Measures						
Inverse Mills Ratio		-1.13***		0.326**		0.188
		(3.32)		(2.60)		(1.21)
α_2(t-1)	-0.331***	0.504***	-0.048	0.020	-0.266***	0.086
	(2.77)	(2.81)	(0.46)	(0.18)	(2.72)	(0.94)
α_3(t-1)	-0.032	0.012	0.033	0.028	0.010	0.111**
	(0.65)	(0.18)	(0.82)	(0.69)	(0.24)	(2.62)
Number of observations	6,161		6,161		6,161	
Chi-squared statistics	348.2		117.3		308.9	
P-value for chi-squared statistics	0.00		0.00		0.00	

Appendix

Description of Loan Covenants in LPC Dataset

According to the Dealscan LPC manual, loan covenants are identified based on the following criteria: *"We search for deals / facilities that contain specific financial restrictions which dictate how a borrower must carry themselves financially in order to avoid breaching the loan agreement."* We have classified loan covenants into two broad categories: accounting-based covenants and other covenants. Below, we present the covenants included in each category and the description provided by DealScan.

I. Accounting-based covenants

I.A. EBITDA-based covenants

1. **Fixed Charge Coverage** –EBITDA divided by (Interest Charges paid plus long-term Lease payments).
2. **Debt Service Coverage** – EBITDA divided by (interest expense plus the quantity of principal repayments).
3. **Interest Coverage** – EBITDA divided by Interest Expense.
4. **Cash Interest Coverage –** Operating Cash Flow divided by Cash Interest Expense.
5. **Debt To Cash Flow** – Outstanding Debt divided by (Net Income plus Depreciation and Other Non-Cash Charges).
6. **Sr. Debt to Cash Flow** – Outstanding debt on a Senior Basis divided by (Net Income plus depreciation and other non-cash charges).

I.B: B&E covenants

1. **Current Ratio** – Current Assets (cash, marketable securities, accounts receivable, inventories, etc…) divided by Current Liabilities (accounts payable, short-term debt of less than one year, etc.)
2. **Debt To Tangible Net Worth** – Total Debt divided by (Net Worth minus intangible assets).
3. **Tangible Net Worth** – (Total assets less intangible assets) minus total liabilities.
4. **Net Worth** – Assets minus Liabilities.
7. **Leverage Ratio** – Debt divided by Capitalization (or equity).
5. **Debt to Equity -** Restriction on the debt/equity ratio**.**
6. **Dividend Restriction -** Restricts dividend to be below a given percent of net income.

II. Other covenants

II.A. Sweeps

General Definitions: Mandatory repayment provisions.

1. **Asset Sales Sweep –** principal must be repaid from excess asset sales.
2. **Debt Issue Sweep –** principal must be repaid from excess debt issuance.
3. **Equity Issue Sweep –** principal must be repaid from excess equity issuance.
4. **Excess CF Sweep –** principal must be repaid from excess cash flow.

II.B. Secured Loan Restriction The loan must be secured with collateral.