Accounting Conservatism and Performance Covenants: A Signaling Approach

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Abstract

This study examines the private debt contracting relation between performance covenants and conservative accounting under asymmetric information. Asymmetric information is characterized by borrowers' proclivity to appropriate wealth from lenders to themselves. We find that accounting conservatism and performance covenants act as complements to signal borrowers' commitment not to appropriate wealth from lenders in the high information asymmetry regime. No such relation obtains in the low information asymmetry regime. We further show that in the high information asymmetry regime, borrowers with high levels of conservatism and tight performance covenants generally enjoy lower interest rate spreads in comparison to borrowers with low levels of conservatism and loose performance covenants. Consistent with our signaling theory, we document that borrowers with high levels of conservatism and tight performance covenants in the high information asymmetry regime are less likely to appropriate wealth from lenders to themselves. Our empirical results are robust to alternative measures of conservatism and covenant restrictiveness.

Keywords: Information asymmetry; accounting conservatism; performance covenants; signaling; wealth appropriation.

1. Introduction

This study examines the private debt contracting relation between performance covenants and conservative accounting under asymmetric information.[1] We characterize information asymmetry as the situation in which lenders are less well informed than borrowers about the latter's potential wealth appropriation proclivities (borrower types) through excessive payouts.[2] We explore the implications of this adverse selection on the relation between conservative accounting and performance covenants in promoting the efficiency of debt contracts. In this setting, absent signaling by borrowers to inform lenders about their (borrowers') type, lenders will price protect themselves by charging a pooling interest rate to all borrowers based on lenders' prior assessment of borrowers' tendency to appropriate wealth. Thus, borrowers with low wealth appropriation proclivities benefit from revealing their type by taking costly signaling behavior in exchange for more favorable borrowing rates. The benefits and costs associated with signaling depend on how knowledgeable lenders are *ex ante* with regard to borrower type (information asymmetry). In our signaling environment, borrowers signal their proclivity to appropriate lenders' wealth via conservatism and covenants in order to maximize their (borrowers') payoffs. Conceptually, the relation between accounting conservatism and covenants is highly nuanced and is conditioned upon the degree of information asymmetry. We posit that conservative

[1] Performance covenants, such as the interest coverage ratio, rely on profitability and efficiency indicators formulated on income statement (or cash flow statement) information alone or in combination with balance sheet information (Demerjian, 2011; Christensen and Nikolaev, 2012). Christensen and Nikolaev (2012) find that performance covenants serve as trip wires by transferring control rights to lenders in states where the value of their claim is at risk.

[2] Borrowers' wealth appropriation proclivities depend on such factors as their investment opportunities and taxes that affect the costs of wealth transfer (i.e., excessive payouts). Specifically, firms with excessive payouts incur various costs such as underinvesting in positive NPV projects, and paying dividend tax rates rather than lower capital gains tax rates. (Bhattachaya, 1979; Miller and Rock, 1985; Smith and Watts, 1992; Yoon and Starks, 1995). Some of these factors such as the amount and duration of future positive NPV projects tend to be more of a private nature, leading to an adverse selection problem.

accounting and covenants are complements in the high information asymmetry regime, but unrelated in the low information asymmetry regime.

We develop a direct empirical measure of the degree of information asymmetry with respect to borrowers' wealth appropriation proclivities calculated as the standard deviation of borrowers' abnormal payouts over the five years before loan initiation. This metric captures the difficulty that lenders have in predicting borrowers' wealth appropriation tendencies.[3] Using private debt data, we find that conservative accounting is positively related to the tightness of performance covenants in the high information asymmetry regime. However no such a relation is observed in the low information asymmetry regime.

We document other empirical results that corroborate our conceptualization of the relation between covenants and accounting conservatism in private debt contracting.[4] Specifically, we show that the combination of more conservative financial reporting *and* more restrictive covenants reduce the cost of debt in the high information asymmetry regime. In contrast, we fail to find value for adopting conservative accounting *and* performance covenant restrictions when the firm is in the low information asymmetry regime. In addition, we utilize excessive payouts to shareholders in the year after loan initiation as a proxy for actual wealth appropriation by borrowers. Focusing on the high information asymmetry regime, we verify that firms that adopt stringent conservative accounting *and* restrictive covenants are less likely to make excessive payouts to shareholders.

[3] Our "residual standard deviation" metric of information asymmetry is inspired by a similar approach in prior finance studies (e.g., Krishnaswami, Spindt, and Subramaniam, 1999, p.416; Krishnaswami and Subramaniam, 1999, p.86). In their context, residual volatility in the firm's stock returns captures asymmetry between investors and managers about value-relevant firm-specific information.

[4] We provide a stylized model to demonstrate that our conceptualization has theoretical underpinnings. For expositional purposes, we relegate the model to an appendix.

Our approach differs from prior literature on two important dimensions. First, we explicitly consider the role of information asymmetry in the private debt contracting setting. Debt contracting provides a key economic explanation for accounting conservatism (Watts and Zimmerman, 1978, 1979, 1986; Watts, 2003).[5] Conservatism benefits lenders by accelerating debt covenant violations after negative shocks, and provides a timelier signal of default risk (Zhang, 2008). Prior empirical studies find a positive association between covenants and conservatism (Beatty, Weber, and Yu, 2008; Nikolaev, 2010).[6, 7] However, they do not explore whether the strength of the association varies with the degree of information asymmetry. Our study directly addresses this issue and therefore complements prior findings.

Second, in addition to the "conventional" view of conservatism based on moral hazard, we propose a signaling role for conservatism (in combination with covenants). We predict that in a lending environment in which lenders are uncertain about borrowers' proclivity to appropriate their wealth, "good" type borrowers with a low tendency to appropriate lenders' wealth are more likely to signal their type via high levels of conservatism (and covenants) to reduce the cost of debt relative to "bad" type borrowers with a high wealth appropriation propensity. Mimicking

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[5] We explicitly consider several other demands for accounting conservatism (e.g., Beatty, Weber, and Yu, 2008) in our robustness tests. Nevertheless, we acknowledge that the literature offers a considerably richer set of explanations for accounting conservatism (Basu, 2005, 2009).

[6] In a public debt setting, Nikolaev (2010) documents a positive relation between accounting conservatism and the use of covenants. Moreover, he shows that the presence of prior private debt attenuates this relation. He attributes this finding to bank's monitoring mechanism substituting for timely loss recognition. Our study proposes and tests a specific monitoring channel, whereby conservatism is used to screen borrowers' types in private debt markets. Our work is consistent with and complements Nikolaev's findings.

[7] Several other papers do not find a clear association between covenants and conservatism (Frankel and Litov, 2007; Begley, Chamberlain, and Kim, 2009) in the private debt context. We conjecture that failure to explicitly consider the effect of information asymmetry on the relation between covenants and conservatism is a potential explanation because, in general, information asymmetry between lenders and borrowers is less severe for private debt.

the good-type is overly costly for the bad-type, and therefore the credibility of conservatism as a signaling device is ensured.[8]

Our findings provide an additional function for conservatism, namely, as a mechanism for signaling borrowers' wealth appropriation tendency in private debt contracting. In particular, good-type borrowers choose a high degree of conservatism *and* restrictive performance covenants to signal their type. We acknowledge that the positive relation between conservatism and covenants could be attributed to a moral hazard explanation as well. In a moral hazard framework, lenders would require a higher level of conservatism and tighter covenants to restrict borrowers' wealth appropriation.[9] However, the moral hazard framework is seemingly unable to explain why the positive relation between conservatism and covenants obtains only for a subset of sample firms, namely only those firms in the high information asymmetry regime.

In addition, we try to distinguish the signaling from the moral hazard explanation based on two additional empirical analyses. First, according to the moral hazard explanation, one should expect to find a larger drop in abnormal payouts around loan initiations for firms with a higher degree of conservatism and tighter covenants. This is not borne out empirically. Second, Begley and Feltham (1999) document that borrowers' incentives to appropriate wealth from lenders are related to CEO compensation structures. Specifically, they show that large CEO cash compensation aligns the CEO's interests with debt holders, while large CEO equity holdings align the CEO's interests with shareholders. If, as predicted by the moral hazard framework, a higher level of conservatism and tighter covenants limit borrowers' ability to appropriate wealth, we should expect to observe a change in CEO compensation composition towards less cash

[8] We acknowledge that this argument hinges on whether borrowers can commit to a level of conservatism. In a validation test, we show that levels of conservatism remain largely unchanged after debt contracts are signed. See Sections 2.3 and 5.4 for a more detailed discussion.

[9] Put somewhat differently, in our signaling setting, borrowers bind themselves to a higher level of conservatism *and* tighter covenants in order to avoid excessive price protection by lenders.

compensation and more equity-based compensation. No such prediction obtains under the signaling approach. Indeed, we find that CEO's cash compensation and wealth-performance sensitivity (Edmans, Goldstein, and Jiang, 2012) do not change significantly around debt contract initiations. Although we cannot conclusively rule out the moral hazard explanation, this combined (qualified) evidence suggests that moral hazard is not the primary driver of the conservatism-covenant relation.

Our empirical results are both economically and statistically significant and are fairly robust to alternative measures of information asymmetry, accounting conservatism, and performance covenant restrictiveness. Along with more standard empirical approaches, we also employ the switching regression methodology of Maddala (1983, 1986, 1991) to account for the potential endogenous assignment of firms to asymmetric information regimes while *simultaneously* estimating the relation between covenants and conservatism. Our empirical results continue to hold. Overall, our signaling framework provides a nuanced view regarding the signaling effectiveness of debt contracts and accounting conservatism not yet as documented by the prior literature.

The remainder of the paper is organized as follows. Section 2 motivates the wealth appropriation view of asymmetric information and develops testable hypotheses. Section 3 outlines the research design. Section 4 describes the data sources and reports the main empirical findings. Section 5 presents additional test results. Section 6 concludes. The appendix develops an analytical signaling model of debt contracting under adverse selection that both motivates and supports the empirical analyses.

2. Motivation and Hypotheses Development

2.1 Wealth Appropriation

Debt covenants are generally understood to be contractual features that protect creditors from activities that transfer wealth from them to shareholders, activities such as excessive dividend payments and risk shifting investments (Smith and Warner, 1979). For example, a large number of studies in the accounting and finance literatures have focused on the size, costs, and consequences of wealth appropriation by borrowers through dividends and the effectiveness of contractual cures (e.g., Jensen and Meckling, 1976; Jensen, 1986; Smith and Warner, 1979; Kalay, 1982; Healy and Palepu, 1990; Long, Malitz and Sefcik, 1994; Gjesdal and Antle, 2001; Douglas, 2003; Brockman and Unlu, 2009). The general tenor of their findings suggests that dividend policy significantly affects the agency cost of debt, and dividend covenants are able to mitigate this cost to some extent but not completely.

Given the nature of debt contracts, there are at least two countervailing considerations. First, covenants, by restricting borrowers' choice set, may help to solve one problem but then act to exacerbate others. For example, explicit restrictive general covenants, such as the obligation not to pay out dividends over certain thresholds (Healy and Palepu, 1990), offer the advantage of being easily verifiable. Nevertheless they bear a high opportunity cost insofar as they may create incentives for earnings management (Daniel, Denis, and Naveen, 2008), negatively affect firms' external financing in the future (Berlin and Mester, 1992; Rajan and Winton, 1995; Kahan and Yermack, 1998; Triantis, 2001), and increase the probability that borrowers will be forced to invest even though they have no profitable projects available (John and Kalay 1982). Therefore, debt contracting parties deliberately choose non-binding restrictions (Kalay 1982), so that explicit dividend restrictions do not fully resolve the creditor-shareholder conflict regarding payout policies.[10]

Second, debt contracts are incomplete in practice due to the difficulty of prescribing all future contingencies in contract provisions (Ball, 1989; Christensen and Nikolaev, 2009; Li, 2010).[11] The incomplete contracting literature predicts that the initial terms of a debt contract might have to be renegotiated upon future unforeseen contingencies (Aghion and Bolton, 1992; Hart, 1995). In fact, one major contingency *ex post* is borrowers' need for more flexible dividend payout, which often prompts the renegotiation of debt contracts (Roberts and Sufi, 2009).

In short, debt contract provisions alone may not fully resolve wealth appropriation problems. Furthermore, information asymmetry between lenders and borrowers likely exacerbates the difficulties that creditors face in screening and monitoring borrowers (e.g., Bharath, et al., 2009). Therefore, when faced with uncertainty regarding borrower type in terms of their tendency to expropriate lenders' wealth, lenders will likely pool firms into broad risk categories and price debt on the basis of the average risk profile within each category (i.e., a cross-subsidization problem). As a result, borrowers with differential proclivity for wealth appropriation may have an incentive to reveal their type through costly signaling mechanisms, including more conservative reporting.[12]

2.2 Hypotheses Development

Although loan officers are informed by credit-relevant information and experience with clients, a pervasive problem in the credit market is that potential borrowers know more about

[10] Nevertheless, we control for dividend covenants throughout our analyses.
[11] Also notable is Spier (1992), who demonstrates that, in the presence of transaction costs, contractual incompleteness may arise from adverse selection.
[12] Jensen and Meckling (1976) and Watts (1977) argue that firms can use external financial reports and audits to reduce information asymmetries with outside financiers.

their own tendency to expropriate wealth than do lenders. We explore the implications of this adverse selection on the relation between conservative accounting and debt covenants. Intuitively, lacking information about future wealth appropriations, lenders infer borrowers' intent based on the debt contracts offered. In equilibrium, borrowers will have to compensate creditors for the inferred amount of wealth appropriation activity.

Borrowers are distinguished by those who do not overly engage in wealth appropriation activity (good-type) and those that do (bad-type). When the information asymmetry about borrower type is high (the high information asymmetry regime), lenders have difficulty in telling good-type borrowers from bad-type borrowers and will price protect themselves by charging an average (pooled) interest rate. This provides good-type borrowers with an incentive to distinguish themselves from bad-type borrowers and obtain a lower interest rate by offering a combination of conservative accounting and covenant signals. Both mechanisms are costly to borrowers in that a higher degree of conservatism and tighter covenants increase the likelihood that a restrictive covenant will be violated, resulting in transfer of control rights from borrowers to lenders.[13] The cost is particularly high for bad-type borrowers if they try to mimic the same combination of signals. Specifically, they lose the gain from the wealth appropriations when lenders are in control. This asymmetric cost function ensures that bad-type borrowers do not mimic good-type borrowers. Note that giving lenders too much control rights hurts borrowers, as lenders may liquidate projects prematurely to secure their claims (Aghion and Bolton, 1992).

[13] In our signaling framework in the appendix, we assume for technical convenience that creditors always liquidate the firm upon covenant violation. Our empirical analysis does not rely on such a restrictive assumption. Prior evidence suggests that almost all violated covenants are renegotiated. Creditors likely impose additional penalties during the renegotiation that depend on borrowers' creditworthiness at the time of the renegotiation (Beneish and Press, 1993; Chen and Wei, 1993). If the information asymmetry about a borrower's type resolves over time, the renegotiation can further enhance good-type borrowers' willingness to distinguish themselves from the bad-type by initially submitting to more conservative reporting and tighter covenants and renegotiate better terms later on. In contrast, bad-type borrowers are unable to mimic such a strategy as creditors will set more stringent terms in the renegotiation. Thus, our analytical exercise provides a lower bound for the signaling role of conservatism in a private debt contracting setting.

The equilibrium combination of conservatism and covenant signals reflects a tradeoff for borrowers between the benefits of sending credible but costly signals in exchange for reduced borrowing costs, and the costs of losing control rights prematurely.

We conjecture that in a separating equilibrium, neither covenants nor conservative accounting *alone* are optimal for borrowers as mechanisms for revealing their type. This conjecture is motivated by the bundling signaling equilibrium result of Kanodia and Lee (1998).[14] In signaling games where the information to be communicated is one-dimensional but multiple signals are available, they demonstrate the importance of considering the interaction among the signaling channels in finding the most efficient (or least costly) mix of signals.

In our setting, both conservatism and covenants can be used to signal borrower type. Intuitively, covenants specify conditions under which control rights transfer from shareholders to creditors, a role that accounting conservatism cannot play. Absent accounting conservatism, covenants become less effective and have to be very restrictive. When conservatism can also be used to signal the type, covenants need not be overly restrictive, reducing overall signaling costs. A combination of covenants and conservative accounting optimally deters the bad-type from mimicking the good-type.[15] In this sense, conservative accounting and covenants are complements in the high information asymmetry regime.

In contrast, when the information asymmetry about borrower type is low (the low information asymmetry regime), creditors can correctly identify good- and bad-type borrowers

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[14] Kanodia and Lee (1998) study a setting in which a firm's management has superior private information about the profitability of new investment opportunities. Direct disclosure of the management's information is not credible, but management can choose the investment level and the precision of their performance report (or disclosure) to signal their private information. They show that using investment alone to signal private information leads to overinvestment, but using a combination of investment and disclosure makes mimicking behavior more costly (the signaling cost) and reduces overinvestment. Thus, the optimal allocation requires a particular bundling of disclosure and investment.

[15] This argument is consistent with Beatty et al. (2008), who empirically challenge the notion that firms can always undo the effect of conservatism by adjusting debt contracts to the optimal level.

with a high probability, and set the contracting terms accordingly. Therefore there is less need for the good-type to reveal her type by resorting to costly signaling mechanisms (conservative reporting and tight covenants).[16] Thus, in the low asymmetric information environment, there should be no relation between covenants and conservative accounting.

In summary, in the high asymmetric information regime, good-type borrowers have an incentive to reveal their type through a combination of accounting conservatism and debt covenants, deterring bad-type borrowers from mimicking them. Contrariwise, in the low asymmetric information regime, the interest rates charged by lenders almost always correctly reflect borrowers' tendency to appropriate creditors' wealth, eliminating the need for signaling. The above discussion leads to the following formal hypotheses concerning the relation between conservatism and covenants stated in the alternative form:

H1a: Conservative accounting and debt covenants are complements in the high information asymmetry regime.

H1b: Conservative accounting and debt covenants are unrelated in the low information asymmetry regime.

When the information asymmetry about borrower type is high, good-type borrowers have strong incentives to reveal their type through costly signaling mechanisms (more conservative accounting and more restrictive covenants) in exchange for lower interest rates. Thus, we expect that loan spreads are lower for borrowers adopting both high levels of conservatism and tighter

[16] In the cross section, when information asymmetry is low, there could be a small number of good-type borrowers misclassified as the bad-type by creditors. These good-type borrowers would have strong incentives to signal their type. But, as they should represent only a very small portion of the sample, their influence on the empirical analyses should be negligible.

covenants. However, with low information asymmetry, creditors are generally able to distinguish good-type borrowers from the bad-type, and offer contract terms that are designed for each type. There is basically no need for borrowers to undertake costly signaling behavior. Hence, we do not expect loan spreads to be systematically associated with high levels of conservatism *and* covenants in the low information asymmetry regime. The above discussion yields the following hypotheses:

H2a: For borrowers in the high information asymmetry regime, conservative accounting *and* tight covenants are associated with lower loan spreads.

H2b: For borrowers in the low information asymmetry regime, conservative accounting *and* tight covenants are not associated with loan spreads.

Another implication of our analysis is that good-type borrowers in the high information asymmetry regime will tend not to appropriate wealth at the expense of their debt holders. In contrast, we have no directional prediction on loan spreads and wealth transfers for borrowers in the low information asymmetry regime. We formulate the hypotheses with reference to excess dividends and stock repurchases.

H3a: Under the high information asymmetry regime, borrowers with conservative accounting *and* tight covenants are less likely to make future wealth transfers from debt holders to themselves in the form of excess dividends and stock repurchases.

H3b: Under the low information asymmetry regime, borrowers with conservative accounting *and* tight covenants are not associated with future wealth transfers.

2.3 Commitment to More Conservative Reporting

Although borrowers and lenders cannot normally contract on the borrowers' future level of accounting conservatism, the prior literature provides at least two reasons as to why borrowers may be willing to commit to a certain level of accounting conservatism before signing the debt contract *and* stick to that level afterwards. First, reducing the degree of conservatism after debt initiation increases the firm's litigation risk (Basu, 1997; Qiang, 2007; Khan and Watts, 2009; Chung and Wynn, 2008). Second, a sudden drop in the level of conservatism generates auditor pressure and higher audit fees (Basu, 1997; Holthausen and Watts, 2001; Nikolaev, 2010; DeFond, Lim, and Zang, 2012). Therefore, we do not expect good-type borrowers to opportunistically report less conservative accounting numbers after signing debt contracts. As a validation check, we examine changes in accounting conservatism pre- and post- signing of debt contracts. Consistent with our expectation, we find that the levels of borrowers' conservatism did not change significantly around loan initiations (see Section 5.4).

3. Research Design

3.1 Measures of Accounting Conservatism

We use Khan and Watts' (2009) *CScore* as the primary measure of accounting conservatism. This measure is based on Basu's (1997) asymmetric timeliness estimation.[17] Specifically, we estimate the following annual cross-sectional regression:

$$\begin{aligned}Earnings_i = {} & \beta_1 + \beta_2 D_i + R_i(\mu_1 + \mu_2 LnMV_i + \mu_3 M/B_i + \mu_4 Lev_i) \\ & + D_i R_i(\lambda_1 + \lambda_2 LnMV_i + \lambda_3 M/B_i + \lambda_4 Lev_i) \\ & + (\delta_1 LnMV_i + \delta_2 M/B_i + \delta_3 Lev_i + \delta_4 D_i LnMV_i + \delta_5 D_i M/B_i + \delta_6 D_i Lev_i) + \varepsilon_i\end{aligned}$$

[17] See recent work (Ball, Kothari, and Nikolaev, 2013a, b) on the validity of Basu's (1997) approach.

where *Earnings* is net income before extraordinary items (COMPUSTAT # ib), scaled by lagged market value of equity; *D* is a dummy variable that equals 1 if stock returns (*R*) are negative, and 0 otherwise; *LnMV* is the natural logarithm of the market value of equity; *M/B* is the market-to-book ratio; and *Lev* is financial leverage, defined as the sum of long-term and short-term debt deflated by market value of equity. We compute *CScore* using data from the year prior to the debt contract initiation.

In the robustness section, we analyze three more conservatism measures: the conservatism ratio by Callen, Segal, and Hope (2010), a skewness measure (*Skewness*), and *CScore* calculated using quarterly data. We do not utilize conservatism measures that capture unconditional conservatism because unconditional conservatism does not enhance debt contracting efficiency (Ball and Shivakumar, 2005, 2006).

3.2 Measures of Debt Covenant Restrictiveness

Dealscan classifies debt covenants into two categories: financial covenants (e.g., current ratio) and general covenants (e.g., dividend restrictions, and asset sales sweep).[18] Among financial covenants, Christensen and Nikolaev (2012) distinguish between (1) performance covenants, which rely on profitability and efficiency indicators including the cash interest coverage ratio, debt service coverage ratio, level of EBITDA, fixed charge coverage ratio, interest coverage ratio, ratio of debt to EBITDA, and ratio of senior debt to EBITDA; and (2) capital covenants, which rely on information about sources and uses of capital including the quick ratio, current ratio, debt-to-equity ratio, loan-to-value ratio, ratio of debt to tangible net

[18] Bradley and Roberts (2004) report that 84% of private debt contracts in the years 1993 to 2001 include dividend restrictions. These covenants typically stipulate the maximum funds available for dividends based on the firm's accounting numbers and equity raised since the time of the debt issue. We control for the presence of dividend restrictions in the analyses.

worth, leverage ratio, senior leverage ratio, and net worth requirement. They find that capital covenants are designed to align the interests of borrowers and lenders *ex ante* while performance covenants serve as trip wires via transfer of control rights to lenders in states where the value of their claim is at risk. This suggests that, in our setting, we should focus on performance covenants as they work together with conservative reporting to signal borrower wealth appropriation type. We do not expect a complementary relation between capital covenants and conservatism (see Section 5.4 for a test on capital covenants).

We measure the overall restrictiveness of covenants in two alternative ways. The first measure is the number of performance covenants in a loan contract (*PerfCov*). This variable is ranked within an industry on a scale from 0 to 1. The second measure reflects the overall tightness of performance covenants (*SlackIndex*) and, similar to Vasvari (2006), computed as the sum of the inverse rank of slacks across all performance covenants in the loan contract. The slack for covenants that specify a maximum accounting number is computed as the percentage ratio, (*Required* – *Actual*) / *Required*, where *Required* is the accounting ratio or number that has to be maintained as per the bank loan, and *Actual* is the accounting ratio or number computed using current balance sheet or income statement information. For covenants that specify a minimum accounting measure, we calculate the negative of the above ratio. Finally, slacks are inversely ranked within an industry on a scale from 0 to 1, so that the larger the number, the tighter the performance covenant.[19]

3.3 Determinants of Information Asymmetry Regimes

We measure the degree of information asymmetry with respect to borrower wealth appropriation proclivity as the standard deviation of abnormal payouts over the five years before

[19] Beatty and Weber (2006) also used the rank measure of covenant slacks.

loan initiation. Abnormal payouts to shareholders represent firms' wealth appropriation activities. We estimate abnormal payouts as follows. First, following Boudoukh, et al. (2007), we calculate total payout as dividends (# dvc) plus repurchases (total expenditure on the purchases of common and preferred stock (# prstkc) plus any reduction in the value of the net number of preferred stock outstanding (# pstkrv)). Following Grullon, et al. (2011) and Banyi, Dyl, and Kahle (2008), we define the determinants of total payout as: the relative market capitalization (the percentile in which the firm falls on the distribution of equity market values for NYSE firms in year *t*), book-to-market ratio (# ceq / (# prcc_f * # csho)), return on assets (# ib / # at), sales growth (# sale / lagged # sale – 1), the logarithm of number of years since IPO, the logarithm of stock return volatility, retained earnings (# re / # at), stock options outstanding (# optosey / # csho), leverage ((# dltt + # dlc) / # at), the logarithm of total assets (# at), free cash flows ((# oibdp – (# txt – # txditc + lagged # txditc) – # tie – # dvp – # dvc) / (# prcc_f * # csho)), and stock returns. To come up with a prediction of total payout, we use the entire COMPUSTAT population from 2000 to 2008 to estimate a Tobit regression of total payouts on the above determinants, inclusive of year and industry fixed effects. As described below, firm-year observations predicted not to pay out but with an actual positive total payout are coded as abnormal payout observations.

Our measure of the degree of information asymmetry between lenders and borrowers is designed to capture borrower-specific uncertainty that lenders face when predicting borrowers' wealth appropriation proclivities. Following a similar approach adopted by Krishnaswami, et al. (1999) and Krishnaswami and Subramaniam (1999), we compute the information asymmetry measure (*StdPayout*) as the standard deviation of abnormal payouts over the five years before loan initiation. As an alternative measure of information asymmetry regimes, because we expect lenders to resolve the uncertainty about borrower type over time, we consider lenders with multiple deals with the same borrower or with relationship lending to be less susceptible to the information asymmetry problem. We present our discussion of alternative determinants of information asymmetry regimes in Section 5.4.

3.4 Testing H1: Does Conservatism Correlate with Covenants Under Alternative Information Asymmetry Regimes?

Hypothesis 1 predicts different relations between accounting conservatism and covenants depending on the degree of information asymmetry between borrowers and lenders.

We assume that there are two separate information asymmetry regimes, each presenting a different relation between conservatism and debt covenants. Regimes are classified based on the median value of the standard deviation of abnormal payouts, where observations with values above (below) the median are categorized as Regime I (II). We estimate the following pooled cross-sectional time-series regression separately for firms residing in the high information asymmetry regime (Regime I) and in the low information asymmetry regime (Regime II):[20]

$$PerfCov_{i,t} = \alpha_0 + \alpha_1 CScore_{i,t-1} + \sum_{j=2}^{9} \alpha_j LoanControls_{i,t} + \sum_{j=10}^{14} \alpha_j FirmControls_{i,t-1} + \sum \delta_I Industry + \varepsilon_{i,t} \quad (1)$$

The dependent variable, $PerfCov_{i,t}$, measures the performance covenant restrictions of firm *i* at time *t*. $CScore_{i,t-1}$ is the conservatism metric for firm *i* at time *t-1*. Following Beatty et al. (2008), we control for loan and firm characteristics in Equation (1). Loan and firm characteristics are discussed in Section 3.7. Industry dummies are also included to control for unobservable

[20] We control for the potential endogeneity of these regimes using switching regressions in the robustness section below.

industry-specific factors.[21] Following Petersen (2009) and Thompson (2011) we adjust standard errors by clustering at the firm level. The inferences for all of the analyses are unaffected when clustering at both firm and year levels.

3.5 Testing H2: Do Conservatism and Covenants Affect Loan Spreads in the High Information Asymmetry Regime?

Hypothesis H2 is also conditioned on being in the high versus low information asymmetry regimes. We estimate the effect of conservatism and covenants on loan spreads separately for each regime using the following OLS regression:

$$\begin{aligned} Spread_{i,t} &= \lambda_0 + \lambda_1 CScore_{i,t-1} + \lambda_2 PerfCov_{i,t} + \lambda_3 CScore_{i,t-1} * PerfCov_{i,t} \\ &\quad + \sum_{j=4}^{10} \lambda_j LoanControl_{i,t} + \sum_{j=11}^{16} \lambda_j FirmControl_{i,t-1} + \sum \delta_I Industry + \delta_{i,t} \end{aligned} \tag{2}$$

where *Spread* is the loan's All-in-Drawn spread (AIS) over LIBOR at issue date. AIS represents the cost to the borrower for each dollar withdrawn.[22] Our main focus here is on the coefficient estimates for the interaction parameter λ_3. We expect λ_3 to be negative in the high information asymmetry regime (Hypothesis 2a), but λ_3 to be insignificant in the low information asymmetry regime (Hypothesis 2b). We also control for loan-specific and firm-specific variables. We adjust standard errors by clustering at the firm level.

3.6 Testing H3: Are Borrowers who signal Conservatism and Covenants Less Likely to Appropriate Wealth?

[21] We follow the industry classification of Barth, Hodder, and Stubben (2008).

[22] Dealscan computes this figure as the sum of the coupon spread and any recurring (annual) fees. For loans not based on LIBOR, Dealscan converts the coupon spread into LIBOR terms by adjusting a constant differential reflecting the historical averages of the relevant spreads.

To assess the likelihood that borrowers with conservative accounting and tight covenants will appropriate future wealth in the high versus low asymmetry regimes (Hypotheses 3a and 3b), we estimate a Probit regression separately for each regime of the form:

$$\text{Prob}(Transfer_{i,t+1}=1) = F(\kappa_0 + \kappa_1 CScore_{i,t-1} + \kappa_2 PerfCov_{i,t} + \kappa_3 CScore_{i,t-1} * PerfCov_{i,t} + \sum_{j=4}^{8}\kappa_j LoanControl_{i,t} + \sum_{j=9}^{14}\kappa_j FirmControl_{i,t-1} + \sum \delta_I Industry + \varepsilon_{i,t}) \tag{3}$$

The dependent variable, $Transfer_{i,t+1}$, is a dummy variable that equals 1 if a firm involved in facility *i*, year *t+1* makes a wealth transfer to shareholders at the expense of debt holders, and 0 otherwise. In this study, we measure wealth appropriation by abnormal payouts (discussed in Section 3.3). Specifically, firm-year observations predicted not to pay out but with an actual positive total payout are coded as abnormal payout observations ($Transfer_{i,t+1}=1$). For all the other observations $Transfer_{i,t+1}$ is assigned a value of zero.[23]

Our main variable of interest is the interaction term *CScore*PerfCov* in Equation (3). Hypothesis 3a predicts a negative coefficient κ_3 for *CScore*PerfCov* in the high information asymmetry regime, while Hypothesis 3b predicts no significant coefficient for *CScore*PerfCov* in the low information asymmetry regime.

3.7 Controls for Loan and Firm Characteristics

We follow prior studies such as Beatty et al. (2008) and Bharath, Sunder, and Sunder (2008) in controlling for loan and firm characteristics in Equations (1) through (3).[24] Variables related to loan characteristics include loan maturity (*Maturity*, measured in the number of months), loan size (*LoanSize*, measured by the logarithm of the facility amount scaled by total

[23] Our inferences are not affected by deleting observations predicted to payout but with zero actual total payouts.
[24] Beatty et al. (2008) interpret many of these characteristics as contract-level and firm-level measures of agency costs.

assets), the performance pricing indicator (*PerfGrid*),[25] the interest rate spread over LIBOR (*Spread*, measured as All-in-Drawn spread in basis points charged by the bank over LIBOR for the drawn portion of the loan facility), the existence of collateral (*Collateral*), the existence of dividend restriction covenants (*DivCov*), the number of general covenants (*GenCov*), and an indicator variable for whether the loan is of the revolving type (*Revolver*).

We also control for the following firm-level variables in Equation (1): a proxy for default risk (*DefRisk*, measured by the probability of bankruptcy following Hillegeist, et al. (2004)), firm size (*LnAsset*, measure by the logarithm of total assets (# at)), return on assets (*ROA*, measured as income before extraordinary item (# ib) / total assets (# at)), asset growth (*Growth*, measured as total assets (# at) / prior-year total assets (# at)), and cash flow volatility (*CFVol*, measured by the standard deviation over the past 5 years of quarterly operating cash flows (# oancfy) / total assets (# atq)).

Firm controls in the case of Equation (2) include market value (*LnMV*, measured as the natural logarithm of stock price (# prcc_f) × share outstanding (# csho)), the default risk proxy (*DefRisk*), cash flow volatility (*CFVol*), financial leverage (*Lev*, measured as (long-term debt (# dlt) + debt in current liabilities (# dlcc)) / (stock price (# prcc_f) × share outstanding (# csho))), and the book-to-market ratio (*BM*, measured as common equity (# ceq) / (stock price (# prcc_f) × share outstanding (# csho))).

In the case of Equation (3), because we use an extensive array of firm characteristics to derive abnormal payouts, we limit ourselves to a parsimonious number of firm characteristics,

[25] According to Asquith, Beatty, and Weber (2005), the performance pricing feature is intended to reduce "adverse selection problems when asymmetric information between the borrower and lender results in a misclassification of credit risk" (p. 102). In addition, Manso, Strulovici, and Tchistyi (2010) argue that performance pricing is used to screen borrowers with different investment opportunities. We treat performance pricing as a control variable since the nature of the information asymmetry problem in this study is specifically about the creditors' information asymmetry regarding the borrower's proclivity to appropriate wealth from creditors.

namely; default risk (*DefRisk*), return on assets (*ROA*), tangible assets (*TangAsset*),[26] accounting losses (*Loss*), asset growth (*Growth*), and the book-to-market ratio (*BM*). In addition, we control for the following loan characteristics: loan maturity (*Maturity*), loan size (*LoanSize*), the existence of dividend restriction covenants (*DivCov*), the number of general covenants (*GenCov*), and the existence of revolving loans (*Revolver*).

4. Data Sources and Main Results

4.1 Data Sources

Loan data are obtained primarily from the Dealscan database supplemented by net worth covenants data from the SDC database. Accounting and stock returns data are obtained from the quarterly COMPUSTAT and Center for Research in Security Prices (CRSP) files. Institutional ownership data are obtained from Thompson Financial's CDA/Spectrum database.

The Dealscan database is used for information on firms' bank loan facilities, including spread over LIBOR, maturity structure, size, loan types (e.g., lines of credit, term loans, etc.), and covenants. The initial data consist of 33,590 deals (49,704 loan facilities) for the years 2000 to 2007. We match each borrower's and/or borrower's parent name to CRSP/COMPUSTAT using both algorithmic matching and manual checking to obtain the GVKEY of borrowers. Matching reduces the sample to 8,698 loan deals (12,334 loan facilities) and 2,859 borrowers. We further require the availability of CRSP/COMPUSTAT firm data at the year-end, prior to the loan origination date, thereby further reducing the sample to 3,021 loan deals (4,228 loan facilities) and 1,433 borrowers. Dropping firms with negative book equity yields the final sample

[26] We follow Berger, Ofek, and Swary (1996) and measure tangible assets as [cash and short-term investments (# che) + 0.715 × receivables (# rect) + 0.547 × inventories (# invt) + 0.535 × PPE Net (# ppent)] / total assets (# at).

of 2,824 loan deals (3,876 loan facilities) and 1,253 borrowers. The resulting panel of loans is fairly evenly distributed across the sample period.

4.2 Descriptive Statistics

Table 1 reports the mean and median values for variables used in the multivariate regressions after winsorizing all continuous variables at the top and bottom 1%. Regime I (II) refers to the high (low) information asymmetry regime. The two sub-samples exhibit significant differences with respect to loan and firm characteristics. In particular, the high information asymmetry group consists of borrowers with more restrictive covenants (including performance covenants and general covenants) and higher *CScores*. Moreover, borrowers in the high information asymmetry regime tend to be charged higher interest rates, borrow less, and have collateralized loans. These borrowers also tend to be smaller in size, have higher book-to-market ratios, and higher default risk.

Table 2 provides a correlation matrix of variables of interest including the accounting conservatism measure, covenant restrictions, and loan-level and firm-level characteristics for the full sample. As expected, the performance covenant restrictiveness variable *PerfCov* is positively and significantly correlated with the covenant slack index (*SlackIndex*), the general covenant intensity (*GenCov*) and the existence of a dividend payout restriction (*DivCov*). The univariate analysis shows that loan spreads are positively and significantly correlated with *PerfCov* but not with *SlackIndex*. Also, loan spreads decrease significantly with the existence of performance pricing, but increase both with general covenant intensity (*GenCov*) and the existence of a dividend payout restriction (*DivCov*). In addition, there are significantly negative correlations of loan spreads with firm-level variables such as asset growth (*Growth*) and profitability (*ROA*).

The negative relationship between borrower size (*LnAsset*) and the two measures of covenant restrictiveness (*PerfCov* and *SlackIndex*) indicate that the debt contracts of large firms have significantly fewer restrictive performance covenants than those of small firms. Consistent with Bradley and Roberts (2004), the significant positive correlations between various measures of covenant restrictions and *Spread* suggest that restrictive covenants alone are not sufficient to reduce the cost of debt. Moreover, our measure of default risk is highly correlated with the book-to-market ratio, suggesting that both are proxies for distress risk. Consistent with Nikolaev (2010), the collateral requirement and various measures of covenant restrictions are positively correlated. Finally, our information asymmetry proxy, *StdPayout*, is positively associated with both *PerfCov* and *CScore*.

4.3 Conservatism and Covenants under Alternative Information Asymmetry Regimes

Table 3 reports the results of the OLS regression of performance covenant restrictiveness on conservatism (*CScore*). Covenant restrictiveness here is defined as the number of performance covenants in the debt contract, ranked by industry and scaled between 0 and 1. Results in Table 3 confirm our Hypothesis 1. The relations between our measure of accounting conservatism and performance covenants are quite different in the two regimes. Covenant restrictions in the high information asymmetry regime are positively and statistically significantly related to *CScore*, indicating that conservative accounting and performance covenants are complements. By contrast, there is no statistically significant association between covenant restrictions and *CScore* in the low information asymmetry regime.[27]

[27] We further partition the sub-sample in the high information asymmetry regime by the abnormal payout indicator. We expect that the complementary relation between the level of conservatism and the number of performance covenants is stronger for firms that have lower abnormal payouts. The (untabulated) results are consistent with our prediction.

In general, the signs of the control variables are also in the expected direction. Performance covenant restrictions are positively associated with the loan spread, loan maturity, the presence of performance pricing, general covenants, collateral, firm performance, and growth in firm assets, and negatively associated with loan amount, firm size and cash flow volatility. After controlling for default risk, loan spreads possibly capture agency costs (Beatty et al., 2008). Thus, the positive loading on loan spreads suggest that some component of agency cost is captured by financial covenants.

4.4 Signaling and Loan Spreads under Alternative Information Asymmetry Regimes

Table 4 shows the effect of conservatism and performance covenants on loan spreads under alterative information asymmetry regimes as in Equation (2). Similar to Zhang (2008), we find that the coefficient on *CScore* is negative and marginally significant in the high information asymmetry regime. Similar to Bradley and Roberts (2004), we find that more performance covenant restrictions are actually associated with a higher cost of debt, as the coefficients on *PerfCov* are positive and significant in both regimes.

Our primary focus is on the coefficient for *CScore*PerfCov*. Consistent with H2a, the estimated coefficient under the high information asymmetry regime is negative and significant. The relation is economically significant as well. For example, by moving both the rank of performance covenants and *CScore* from one standard deviation below to one standard deviation above their respective means, the loan spread will *incrementally* drop by about 17.6 basis points under the high information asymmetry regime. Relative to the mean spread (253.011) for the high information asymmetry regime, the incremental effect represents a 7% drop. We interpret this result as indicating that the combined adoption of conservative accounting and performance covenants has signaling value in the high information asymmetry regime. By contrast, the estimated coefficient on *CScore*PerfCov* in the low asymmetry regime is insignificant, consistent with H2b.

4.5 Signaling and Future Wealth Appropriation

We test Hypotheses 3a and 3b, using the Probit regression specified in Equation (3). Table 5 presents the coefficients and the marginal effects. In the high information asymmetry regime, the coefficient on *CScore*PerfCov* is negative and significant, which is consistent with H3a. In terms of economic significance, shifting both *PerfCov* and *CScore* from one standard deviation below to one standard deviation above their respective means implies an incremental 9% drop in the probability of being an abnormal payout observation ($Transfer_{i,t} = 1$). By contrast, consistent with H3b, in the low information asymmetry regime, the coefficient on *CScore*PerfCov* is insignificant.

5. Additional Tests and Results

5.1 Alternative Explanation: Moral Hazard

In our adverse selection signaling framework, good-type borrowers choose a high degree of conservatism and restrictive covenants to signal their type. In a moral hazard framework, lenders also require a higher level of conservatism and tighter covenants to restrict borrowers' wealth appropriation.[28] We attempt to distinguish signaling and moral hazard predictions empirically.

[28] Put differently, borrowers bind themselves to a higher level of conservatism and tighter covenants so as to avoid excessive price protection by lenders.

First, according to the moral hazard explanation, we should expect a larger drop in abnormal payouts around loan initiations for firms with a higher degree of conservatism and tighter covenants. This is not borne out empirically as shown in Table 6, Panel A. In the high information asymmetry regime, for the sample firms whose *CScore* and *PerfCov* both reside in the top tercile, we do not observe a statistically significant reduction in abnormal payouts from the year before the loan initiation to the year after. Second, we compare CEO compensations around loan initiations. Begley and Feltham (1999) show that large CEO cash compensation aligns the CEO's interests with debt holders, while large CEO equity holdings align the CEO's interests with shareholders. Therefore, borrowers' incentives to appropriate wealth are related to CEO compensation structure. A higher level of conservatism and tight covenant would limit borrowers' ability to appropriate wealth, suggesting a diminished need for aligning CEO compensation to the benefit of debt holders. In other words, we should instead observe a shift in CEO compensation composition towards more equity holdings and less cash compensation. By comparison, no prediction can be made under the signaling explanation. Table 6, Panels B and C show that changes in CEO cash compensation and CEO wealth-performance sensitivity (Edmans, et al., 2012) are insignificant for firms whose *CScore* and *PerfCov* both reside in the top tercile. Combined together, the (qualified) evidence suggests that moral hazard is not the operative driver of the conservatism-covenant relation.

5.2 Results from an Alternative Measure of Covenant Restrictiveness

Up to this point, the primary measure of covenant restrictiveness was defined by the number of performance covenants in a debt contract (*PerfCov*). As a robustness check, Table 7 replicates our results for the measure of overall tightness of performance covenants (*SlackIndex*).

Panel A shows that accounting conservatism is positively and significantly associated with *SlackIndex* in the high asymmetry regime. The relation between conservatism and covenant restrictiveness is insignificant in the low asymmetry regime. These results are consistent with Hypothesis 1.

Panel B reports the estimation of the signaling role of conservatism and financial covenants on loan spreads. The interaction term *CScore*SlackIndex* is negatively and significantly associated with loan spreads in the high asymmetry regime and insignificant in the low asymmetry regime. Overall, these results support Hypotheses 2a and 2b.

The results from Panel C are consistent with Hypotheses 3a and 3b. We find a significant (insignificant) negative relation in the high (low) asymmetry regime between *CScore*SlackIndex* and abnormal payouts.

5.3 Results from a Switching Regression Model Estimation

While we have used the median value of the standard deviation of abnormal payouts to separate the information asymmetry regimes, the relative information asymmetry status of sample firms is practically not observable, either cross-sectionally or over time. Partitioning the sample based on a noisy proxy could induce sample selectivity and measurement error biases in the OLS coefficients (Heckman, 1979; Maddala, 1983, 1986, 1991; Dietrich, Muller and Reidl, 2007). Instead, we implement a switching regression model (with unknown sample separation) to assess the impact of information asymmetry on the signaling effectiveness of conservatism and covenants (e.g., Maddala, 1983, Ch. 9). We assume that there are two separate information asymmetry regimes, each presenting a different relation between conservatism and debt covenants. The switching regression model estimates separate regressions for each asymmetry information regime without *a priori* classifying firms into a high information asymmetry regime or a low information asymmetry regime. Rather, the (unobservable) regime in which firms find themselves is determined by the data and a selection model. The selection equation controls for the determinants of the degree of information asymmetry between lenders and borrowers.

More formally, the switching regression model is composed of the following system of three equations that are estimated simultaneously:

$$PerfCov_{1i,t} = \alpha_0 + \alpha_1 CScore_{i,t-1} + \sum_{j=2}^{9} \alpha_j LoanControls_{i,t} + \sum_{j=10}^{14} \alpha_j FirmControls_{i,t-1} + \sum \delta_T Year + \varepsilon_{i,t} \quad (4)$$

$$PerfCov_{2i,t} = \beta_0 + \beta_1 CScore_{i,t-1} + \sum_{j=2}^{9} \beta_j LoanControls_{i,t} + \sum_{j=10}^{14} \beta_j FirmControls_{i,t-1} + \sum \gamma_T Year + \nu_{i,t} \quad (5)$$

$$Regime^{*}_{i,t} = Z_{i,t}\psi + \mu_{i,t} \quad (6)$$

Equations (4) and (5) are the structural equations that describe the relation between accounting conservatism and debt covenants for the high and low asymmetric information regimes, respectively. Performance covenant restrictions, $PerfCov_{i,t}$, undertaken by firm *i* at time *t*, are defined as:

$$PerfCov_{i,t} = PerfCov_{1i,t} \text{ if } Regime^{*}_{i,t} > 0 \qquad PerfCov_{i,t} = PerfCov_{2i,t} \text{ if } Regime^{*}_{i,t} \le 0.$$

$Regime^{*}_{i,t}$ is a latent unobservable variable measuring the likelihood of being in the high information asymmetry regime (Regime I) versus the low information asymmetry regime (Regime II). The regime assignment is observable to the players (e.g. lenders and borrowers) but not to researchers.

Equation (6) is the selection equation that determines the firm's "propensity" to be in one or the other information asymmetry regime. $Z_{i,t}$ denotes the vector of variables that determine the regime for firm *i* at time *t* and ψ is a vector of parameters relating these variables to the specific (unobserved) regime. Empirically, we will assume that regime is determined by our appropriation-based information asymmetry proxy.

The model parameters are estimated by the method of Simultaneous Maximum Likelihood using numerical maximization techniques. Observations are classified as belonging to the high (low) asymmetry regime if the estimated probability of being in that regime from the switching regression analysis [Equations (4)-(6)] is greater than 0.5.

Table 8, Panel A shows the estimated switching regressions. The results are consistent with Hypothesis 1. In particular, covenant restrictions in the high (low) information asymmetry regime are positively and statistically significantly (insignificantly) related to *CScore*.

Panel B shows the estimated selection equation. We find that lenders with higher volatility of abnormal payouts in the past five years are more likely to be in the high information asymmetry regime. Thus, our appropriation-based information asymmetry proxy appears to play a significant and intuitive role in determining the likelihood of a firm being in a particular information asymmetry regime.

5.4 Additional Empirical Tests

Changes in accounting conservatism after entering into a debt contract: Although we do not expect a change in the borrower's financial reporting conservatism after entering into a debt contract on theoretical grounds, empirical verification is a desideratum. Therefore, we separate firms into high and low information asymmetry regimes. For each group, we compare the change in the borrower's accounting conservatism after the borrower enters into the contract relative to its conservatism level before signing the contract. We find no evidence of a change in conservatism levels after a borrower enters into the contract (untabulated). Results from our robustness checks are consistent with the related findings of Beatty et al. (2008) and Nikolaev (2010).

Controls for other demands of accounting conservatism: Similar to Beatty et al. (2008), we first regress accounting conservatism on institutional ownership, an indicator for firms in a high litigation risk industry (SIC codes 2833-2836, 3570-3577, 3600-3674, 5200-5961, 7370-7374), and estimated corporate marginal tax rates from John Graham's website.[29] We then use residuals from the regression as our new measure of accounting conservatism. Our inferences do not change.

Alternative measures of accounting conservatism: We conduct supplementary analyses exploring three alternative measures of conservative accounting. These include the conservatism ratio of Callen et al. (2010), and *Skewness*, defined as minus one times the ratio of the skewness in quarterly earnings (# nyq) scaled by market value to the skewness in cash flows (# oancfy) scaled by market value (Basu 1995; Ball, Kothari, and Robin, 2000).[30] We measure *Skewness* using a maximum of 20 quarters and a minimum of 5 quarters of data prior to entering into the contract. In addition, we calculate *CScore* using quarterly COMPUSTAT data and take the average over the past 20 quarters preceding each private debt initiation. We obtain consistent results for these three additional conservatism measures (untabulated). We also utilize demeaned conservatism measures to facilitate the interpretation of the single effect from *PerfCov*. Our inference remains the same.

Alternative determinants of information asymmetry regimes: While we expect lenders to be uncertain regarding borrower type, the uncertainty should be resolved over time. Lenders in a relationship with existing borrowers will become more knowledgeable about the borrowers'

[29] See https://faculty.fuqua.duke.edu/~jgraham/taxform.html.

[30] Since the items in the statement of cash flows reflect year-to-date figures for each quarter, we adjust them by taking the increments.

operations and risk taking proclivities, effectively reducing information asymmetry between the parties (e.g., Berger and Udell, 1995; Chava and Roberts, 2008; Bharath, et al., 2009). Furthermore, by signaling, the good-type borrower can successfully separate herself from the bad-type. Thus, conservatism and covenant choices should reduce subsequent information asymmetry. We explore this dynamic by examining firms with multiple deals in our sample and deals attributed to relationship lending. Our untabulated results suggest that, consistent with the signaling story, the signaling effect is only significant for the initial deal or deals made by non-relationship lenders.

Replacing performance covenants with capital covenants: Similar to Christensen and Nikolaev (2012), we also consider covenants involving the quick ratio, current ratio, debt-to-equity ratio, loan-to-value ratio, ratio of debt to tangible net worth, leverage ratio, senior leverage ratio, and net worth to be capital covenants. We rerun all tests after replacing performance covenants with these capital covenants, In untabulated results, all coefficient estimates in the high asymmetry regime are statistically insignificant. Overall, these results add confidence to our main findings.

6. Conclusion

Watts (2003) (and earlier, Watts and Zimmerman, 1978, 1979, 1986) argues cogently that there is a debt contracting demand for accounting conservatism. Christie (1990) and Fields, Lys, and Vincent (2001) conclude that the contracting theory provides a partial explanation of the demand and supply for accounting choices. Along this line of thought, accounting researchers have investigated whether accounting conservatism enhances the efficiency of debt contracts by examining the relation between conservatism and debt covenants, and provided pervasive evidence consistent with the debt contracting demand for accounting conservatism, primarily from the perspective of the debt holders. We complement extant research by revisiting the relation between accounting conservatism and debt covenants in a debt contracting context where private debt holders have varying degrees of information regarding borrowers' tendency to appropriate wealth. In our setting, high information asymmetry between borrowers and lenders incentivizes borrowers to signal their type via conservative accounting and performance covenants. We conjecture that when there is a high degree of information asymmetry between borrowers and lenders, accounting conservatism and covenants are complements in the efficient design of debt contracts. Contrariwise, conservatism and covenants are predicted to be unrelated to each other when there is a low degree of information asymmetry between borrowers and lenders. We provide empirical evidence consistent with this argument.

Furthermore, departing from the "conventional" view of conservatism based on moral hazard where debt holders demand more conservatism for firms with higher risk of agency conflicts, our signaling framework predicts and finds that in an environment with high information asymmetry in which lenders are uncertain about borrowers proclivity to appropriate their (the lenders) wealth, good-type borrowers with lower agency conflicts are more likely to signal their type via conservatism (and covenants) to reduce the cost of debt relative to bad-type borrowers with higher agency conflicts. We interpret this result as identifying a signaling function for accounting conservatism in the context of the private debt contracting setting. Thus, we uncover another dimension of the role of conservatism in debt contracts beyond the moral hazard view, reinforcing the theory of contracting demand for conservatism.

We further show that under a high information asymmetry regime, borrowers with high levels of conservatism and tight covenants generally enjoy lower interest rates than borrowers with low levels of conservatism and loose covenants. The latter result does not obtain in the low information asymmetry regime. In addition, we document that borrowers with high levels of conservatism and tight covenants in the high information asymmetry regime are less likely to appropriate future wealth from their creditors. These results provide corroborating evidence consistent with our signaling conceptualization of conservatism and covenants.

Appendix: A Signaling Framework of Conservatism and Covenants

This appendix provides a stylized signaling model of the impact of information asymmetry between lenders and borrowers on accounting conservatism, debt covenants, and debt spreads. The objective of this exercise is to support our conceptual argument above, namely, that the mix of conservatism and covenants serves as a costly signaling mechanism to mitigate informational frictions between borrowers (shareholders) and lenders (debt holders) arising from borrowers' proclivity to appropriate wealth from lenders to themselves. We acknowledge that this may not be the only way to model the conservatism-covenant relation and that there exist theories or conceptualizations suggesting other distinctive roles that conservatism plays in debt contracting (see Watts, 2003 for a summary), and even in broader contracting settings beyond debt (Basu, 2005, 2009).

Given our modest objective, and the technical complexities of solving explicitly for the signaling equilibrium in a framework with multiple dimensions of signaling mechanisms, we elect to model the relations among accounting conservatism, debt covenants, and debt spreads by incorporating asymmetric information (in a heavily parameterized fashion) into an extant model by Gigler et al. (2009). We further restrict ourselves to the parameter space that allows us to make differential empirical predictions regarding the relation between conservatism and covenants in different asymmetric information regimes.[31]

The model develops as follows. A firm (or borrower) has exclusive rights to a project financed by $\$K$ of debt at date 0. At date 1, the firm's accounting system produces a noisy signal y about the eventual outcome of the project. The firm has the option to either continue the project, or liquidate the project and receive a known deterministic liquidation value of M. If the project is

[31] It is not our intention to build a theory and then formally test the theory empirically. Such an ambitious objective requires that the modeled elements, including the restricted parameter set, have identifiable real-world counterparts.

continued, it produces an uncertain cash flow x at date 2, which takes one of the two values, x_H and x_L ($x_H > x_L$), with equal probability. For simplicity, the risk-free return equals 0. We assume that $x_H > E(x) > K > M > x_L$, which ensures that at the time of initiation, the project has a positive net present value and neither the lender nor the residual claimant is interested in liquidating the project *ex ante*. With neutral accounting (defined below), the accounting signal y follows a uniform distribution over $[0,1]$ *ex ante* and $\Pr(x_H \mid y) = \frac{1}{2}(y + \frac{1}{2})$. By the Bayesian rule, the density function of y conditional on the realization of x is given by $f(y \mid x_H) = y + \frac{1}{2}$ and $f(y \mid x_L) = -y + \frac{3}{2}$. Thus, a higher value of y indicates a higher probability that the cash flow of the project takes the value of x_H at date 2. Let D be the chosen face value of the loan (which implicitly determines the interest rate); so when the project continues at date 2, the lender receives the amount D if x_H is realized ($x_H > D$), or x_L if x_L is realized ($x_L < D$). D cannot be less than M in equilibrium (Gigler et al. 2009).

Accounting conservatism is defined by reference to the parameter δ, which is related to the skewness of the distribution of y conditional on the realization of x. Let $f(y \mid x_i; \delta)$ where $i \in \{H, L\}$ denote the probability density of the accounting signal conditional on the true future cash flow x_i, given the level of accounting conservatism δ. In the following analysis, we assume that the density function f takes the form:

$$\begin{cases} f(y \mid x_H; \delta) = \delta(y - \frac{1}{2}) + 1; \\ f(y \mid x_L; \delta) = (\delta - 2)(y - \frac{1}{2}) + 1 \end{cases} \quad \text{for } y \in [0,1] \text{, and 0 otherwise, where } \delta \in [0,1].$$

Note the feature of this density: lower values of δ mean higher levels of conservatism; and as the degree of conservatism increases (i.e., δ decreases), $f(y \mid x_H; \delta)$ becomes flatter and $f(y \mid x_L; \delta)$

becomes steeper, yielding a higher probability that a lower signal will be generated, consistent with the notion of accounting conservatism.

The borrower can be a good-type, who maintains the payoffs to each party when the project continues to date 2; or a bad-type, who always transfers a positive amount T from the lender to the residual claimants either through dividends or asset substitution if the project continues beyond date 1.[32, 33] It is public knowledge that the borrower is a good-type with probability $p \in (0,1)$.[34] The borrower knows her own type.

Ideally, a lender will self-protect against possible transfers of wealth to residual claimants by charging a higher interest rate to the bad-type borrower and a lower interest rate to the good-type borrower. However, when the lender cannot perfectly distinguish between the borrower types, he will charge a moderate pooling rate by taking into account the likelihood of interacting with both types of borrowers, given his knowledge about the distribution of types. In such a case, a good-type borrower has two options. She can reveal her type through costly signals (i.e., higher levels of conservatism and/or tighter covenants), which the bad-type cannot mimic and thus enjoy a lower interest rate. Alternatively, she can choose to pool with the bad-type by employing the same levels of conservatism and covenants, and be charged the pooling rate. The bad-type

[32] This type of information asymmetry can also be found in the model of Garleanu and Zwiebel (2009).

[33] We assume that *T* has some intermediate values relative to x_H, x_L, and M. When *T* is small, it turns out that under our parametric specification, tighter covenants are the least costly device. So the good-type borrower implements the lowest level of conservatism mandated by GAAP, and adjusts covenants accordingly. But, too large a *T* gives the bad-type borrower a strong incentive to mimic the good-type. In order to distinguish herself, the good-type borrower has to use extremely conservative accounting and/or restrictive covenants, with a concomitant large loss in economic efficiency. A moderate *T* provides a unique separating equilibrium in which the good-type borrower uses both more conservative reporting and tighter covenants to signal her type. When this condition is not satisfied, we may have a pooling equilibrium or a separating equilibrium where the good-type borrower only uses covenants as a signaling device. In either case, we don't have a prediction on the association between covenants and conservatism. Therefore, an intermediate value of *T* is required to empirically distinguish the two scenarios (high vs. low information asymmetry). Whether on average *T* satisfies this condition or not is an empirical question, and we let the data speak to this. More technically, *T* has to satisfy the condition:

$$\{16[E(x)-M]^2 + 3M x_L\}/[8(x_H - x_L)] < T < \{16[E(x)-M]^2 + 2(x_H - x_L)[E(x)-M] + 12M x_L\}/[6(x_H - x_L)].$$

[34] In a large economy, one can also interpret *p* as the proportion of good-types in the economy.

borrower will be happy to pool with the good-type and enjoy the pooling rate. But, in the event that the good-type reveals her type (in a separating equilibrium), the bad-type has to accept a contract with a higher interest rate, because mimicking the good-type is overly costly. [35] Whether a good-type borrower has an incentive to reveal her type or not depends on tradeoff between the benefit (i.e., the reduced interest rate) and the cost (higher likelihood of project termination) of adopting the signaling devices, which we show later is contingent on the information asymmetry between the lender and borrower.

A benchmark case: The first-best solution

Let us focus first on the case where the lender has perfect knowledge of the borrower type. If the borrower is a good-type, having observed a signal *y* at date 1, the value to the lender of continuing the project is given by:

$$V(D,y;\delta)=\text{Prob}\,(x_H\mid y;\delta)\,D+\text{Prob}\,(x_L\mid y;\delta)\,x_L \qquad \text{(A1)}$$

The value to the borrower of continuing the project is then

$$U(D,y;\delta)=\text{Prob}\,(x_H\mid y;\delta)\,(x_H-D) \qquad \text{(A2)}$$

Given the level of accounting conservatism, $\delta\in[0,1]$, a debt contract is a pair $\{D,y^c\}$, where *D* represents the implicit interest rate, and y^c denotes the covenant level below which the project is liquidated. At date 0, given δ and debt covenant y^c, the expected payoff to the lender from the loan is:

$$\hat{V}(D,y^c;\delta)=\int_0^{y^c} M\;f(y;\delta)dy+\int_{y^c}^{1} V(D,y;\delta)\;f(y;\delta)dy \qquad \text{(A3)}$$

The expected payoff to the good-type borrower is then

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[35] Borrowers with no proclivity to engage in wealth appropriations (good-type) would forego less when the project is terminated than borrowers with that proclivity (bad-type). So the marginal cost of conservative accounting and/or covenants is lower for good borrowers. This sustains the single crossing property. As in Grossman and Hart (1983), we require that borrowers precommit to their choices. Dewatripont (1989) discusses the progressive information revelation process when the pre-commitment requirement is relaxed.

$$\hat{U}(D, y^c; \delta) = \int_{y^c}^{1} U(D, y; \delta)\ f(y; \delta) dy \tag{A4}$$

As Gigler et al. (2009) show, the borrower will choose the least conservative accounting, i.e., $\delta = 1$. The borrower then solves the problem:

$$\underset{D,\, y^c}{\text{Max}}\ \hat{U}(D,\, y^c; \delta = 1)$$
$$\text{s.t. } \hat{V}(D,\, y^c; \delta = 1) \geq K$$

so the optimal debt contract $\{D^*, y^*\}$ is defined by the system of equations:

$$\begin{cases} \mathrm{E}[x \mid y^*; \delta^* = 1] = M \\ \hat{V}(D^*, y^*; \delta^* = 1) = K \end{cases} \tag{A5}$$

If the borrower is a bad-type, at date 0, given the level of accounting conservatism δ and debt covenant y^c, the expected payoff to the lender from the loan is

$$\hat{\hat{V}}(D, y^c; \delta) = \int_0^{y^c} M\ \ f(y; \delta) dy + \int_{y^c}^{1} [V(D, y; \delta) - T]\ f(y; \delta) dy \tag{A6}$$

As a consequence, the optimal debt contract $\{D^{**}, y^{**}\}$ is defined by the system of equations:

$$\begin{cases} \mathrm{E}[x \mid y^{**}; \delta^{**} = 1] = M \\ \hat{\hat{V}}(D^{**}, y^{**}; \delta^{**} = 1) = K \end{cases} \tag{A7}$$

It can be easily verified that $y^{**} = y^*$ and $D^{**} > D^*$.so that the only difference between the good and bad-type borrower in the optimal debt contract is that the lender charges the bad-type a higher interest rate to compensate for future transfers. The expected total surplus from the investment is the same for both types. Because the lender always gets an expected payoff *K*, the expected payoffs for the good-type and bad-type are identical.

Applying the functional form of *f*, yields the optimal contract: $\delta^* = \delta^{**} = 1$, and $y^* = y^{**} = \dfrac{1}{2} + \dfrac{M - 0.5(x_H + x_L)}{0.5(x_H - x_L)} < \dfrac{1}{2}$.

When type is not fully known

The lender does not know the borrower's exact type but *ex ante* he knows that with probability *p*, the borrower is a good-type. The lender price protects himself from a pooling equilibrium. Therefore, at date 0, given the level of accounting conservatism δ and debt covenant y^c, the expected payoff to the lender from the loan is

$$\hat{\hat{\hat{V}}}(D, y^c; \delta) = \int_0^{y^c} M \ f(y;\delta)dy + \int_{y^c}^{1} [V(D, y;\delta) - T\ (1\text{-}\ p)]\ f(y;\delta)dy\ . \qquad \text{(A8)}$$

In this case, the optimal debt contract $\{D^{pooling}, y^{pooling}\}$ is defined by the system of equations:

$$\begin{cases} \mathrm{E}[x \mid y^{pooling}; \delta = 1] = M \\ \hat{\hat{\hat{V}}}(D^{pooling}, y^{pooling}; \delta = 1) = K \end{cases} \qquad \text{(A9)}$$

It can be verified that $y^{pooling} = y^{**} = y^*$ and $D^{**} > D^{pooling} > D^*$. So the good-type borrower cross-subsidizes the bad-type borrower. Given conservatism δ and covenant *y*, the expected payoff to the good-type borrower $\hat{U}(D, y;\delta)$ is strictly decreasing in *D*. From (A9), $D^{pooling}$ is strictly decreasing in *p*, so $\hat{U}(D^{pooling}, y^*; \delta^* = 1)$ is strictly increasing in *p*. As *p* approaches 1, $\hat{U}(D^{pooling}, y^*; \delta^* = 1)$ approaches $\hat{U}(D^*, y^*; \delta^* = 1)$, which is the good-type borrower's payoff under the first best scenario. As *p* approaches 0, $\hat{U}(D^{pooling}, y^*; \delta^* = 1)$ approaches $\hat{U}(D^{**}, y^{**}; \delta^{**} = 1)$, which is the bad-type borrower's payoff under the first best scenario. Therefore, a lower *p* gives the good-type borrower a greater incentive to reveal her type through higher levels of both conservatism and/or covenants. It is reasonable to assume that there exists a $p^* \in (0,1)$ such that a good-type borrower is indifferent between revealing her type (and receiving a lower interest rate, but facing a higher likelihood of project termination) and pooling with a bad-type borrower (and receiving a higher interest rate but facing a lower likelihood of project termination).

To obtain a separating equilibrium, we need to construct two sets of menus $\{D^g, y^g, \delta^g\}$ and $\{D^b, y^b, \delta^b\}$ for good and bad borrower types, respectively, so that (1) the sets of menus maximize the expected payoffs of each type and (2) neither type will find it beneficial to mimic the other type. This requires that $\{D^g, y^g, \delta^g\}$ solves the problem:

$$\underset{D', y', \delta'}{\text{Max}} \int_{y'}^{1} [\mathrm{E}(x \mid y; \delta') - V(D', y; \delta')] f(y; \delta') dy$$

$$\text{s.t. } \int_0^{y'} M \; f(y;\delta')dy + \int_{y'}^{1} V(D', y; \delta') \; f(y;\delta')dy \geq K \quad \text{(IR)}$$

$$\int_{y^1}^{1} [\mathrm{E}(x \mid y; \delta') - V(D', y; \delta') + T] f(y;\delta')dy \leq \int_{y^b}^{1} \mathrm{E}(x \mid y; \delta^b) - V(D^b, y; \delta^b) + T] f(y;\delta^b)dy \quad \text{(IC)}$$

The latter program says that the good-type maximizes her expected payoff subject to two constraints. The individual rationality constraint (IR) ensures that the lender is willing to participate under the contract $\{D^g, y^g, \delta^g\}$. The incentive compatibility constraint (IC) makes it undesirable for the bad-type to pretend to be a good-type. The solution to this problem applying the functional form for *f* is:

$$y^g = \frac{1}{2} > y^b = y^*, \text{ and, } 0 < \delta^g = \frac{\frac{(4M - x_H - 3x_L)^2}{x_H - x_L} + 4x_H + 6x_L - 10M - 6T}{x_H + x_L - 2M + 2T} < 1 = \delta^b = \delta^*.$$

Before the borrower and the lender sign the loan contract, some information, denoted *S*, about the borrower's type is generated and observed by both the lender and the borrower.[36] The

[36] We do not model the source of the information here. One way to look at this is that the signal is generated through interaction between the borrower and the lender, such as communications between the two parties and a prior

information is stochastically related to the underlying type in the following way: when the underlying type is good (bad), the probability of a good signal, S_G (a bad signal, S_B), is q, and the probability of a bad signal, S_B (a good signal, S_G), is thus $(1-q)$, where $q \in [0.5, 1]$.[37] The parameter q captures the degree of information asymmetry: a higher q reflects less information asymmetry between the borrower and the lender. The lender updates his belief regarding the borrower's type after receiving *S*. We conjecture that for a given p^*, there exists a $q^*(p^*)$ such that when q is smaller than $q^*(p^*)$, a good-type borrower chooses to reveal her type by adopting the menu $\{D^g, y^g, \delta^g\}$.

Having observed a bad signal, the updated probability of a good-type is $Q' = \text{prob(good type}|\text{S}_\text{B}) = \dfrac{p(1-q)}{p(1-q)+(1-p)q} < p$. Having observed a good signal, S_G, this probability is $Q' = \text{prob(good type}|\text{S}_\text{G}) = \dfrac{pq}{pq+(1-p)(1-q)} > p$. Note that Q (Q') is strictly increasing (decreasing) in *q*. As $q \to 1$, $Q \to 1$ ($Q' \to 0$) and as $q \to \frac{1}{2}$, $Q \to p$ ($Q' \to p$). Let $Q^* = p^*$. Then for $Q < Q^*$ (which implies $Q' < Q^*$), the good-type borrower prefers to reveal her type; however, for $Q > Q^*$, the good-type is willing to pool with the bad-type.[38] Thus, Q^* uniquely determines the indifference level of information asymmetry q^* through $Q^* = \dfrac{pq^*}{pq^* + (1-p)(1-q^*)}$. This is consistent with the lender's strategy.

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working relationship. Explicitly modeling such sources adds more signaling vehicles and renders the model intractable. What is important is that such information does not completely remove the information asymmetry,

[37] It can be easily verified that when $q = 1$, the information *S* perfectly reveals the borrower's type and there is no information asymmetry. When $q = 0.5$, the information *S* tells nothing about the borrower type.

[38] The good-type with a bad signal will signal. Because q is high, this is a low likelihood event. Thus, in the cross-section, its effect should be negligible.

Calculation of the exact contract terms in the various scenarios resembles the procedure set forth in the no-signal case. In the low information asymmetry case ($q > q^*$), when the signal is good, a contract $\{\hat{D}, y^*, \delta = 1\}$ will be offered, where y^* is defined as before and $\hat{D}$ is derived in the same way as $D^{pooling}$ with p replaced by Q ; when the signal is bad, two contracts $\{D^{**}, y^*, \delta = 1\}$ and $\{D^g, y^g, \delta^g\}$ will be offered by borrowers according to their true types. In the high information asymmetry case ($q < q^*$), two contracts $\{D^{**}, y^*, \delta = 1\}$ and $\{D^g, y^g, \delta^g\}$ will be offered by the borrowers according to their true types, regardless of which signal might have been observed.

This discussion leads to the following testable claims:

(a) When the degree of information asymmetry is low, both the bad-type and good-type borrowers with good signals implement low levels of conservatism and covenants, and thus we expect no association between conservatism and covenants;

(b) When the degree of information asymmetry is high, there exists a separating equilibrium where the good (bad)-type borrower implements high (low) levels of conservatism and covenants, and thus we expect a positive association between conservatism and covenants;

(c) When the degree of information asymmetry is high, on average, the borrower with high levels of conservatism and covenants enjoys a lower interest rate than the borrower with low levels of conservatism and covenants.

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Table 1
Descriptive Statistics

Table 1 presents descriptive statistics for the full sample of 3,876 observations over the period 2000-2007. Regime I (II) refers to the high (low) information asymmetry regime. Variables are defined as follows: *PerfCov* is the number of performance covenants in the loan contract. *SlackIndex* is computed as the sum of the inverse ranks of slack across all performance covenants in the loan contract. Slack for covenants that require a maximum accounting number is computed as the percentage slack ratio, (*Required – Actual*) / *Required*, where *Required* is the accounting ratio or number that has to be maintained as per the loan contract and *Actual* is the accounting ratio or number computed using current balance sheet or income statement information. For covenants that require a minimum accounting measure, we substitute the negative of the above ratio. Each slack is inversely ranked within the industry on a scale from 0 to 1 so that the larger the number, the tighter the specific financial covenant. Due to COMPUSTAT data limitations, covenant slack at the loan inception is available for four performance covenants only as follows: Max. Debt to Cash Flow covenant measured as Total Debt / Cash Flow; Min. Cash Interest Coverage covenant measured as Operating Cash Flow / Interest Expenses; Min. Interest Coverage covenant measured as EBITDA / Interest Expense; and Min. EBITDA covenant measured as EBITDA. *DivCov* is a dummy variable that equals 1 if the debt contract contains a dividend payout covenant restriction and 0 otherwise. *GenCov* is the number of general covenants in the debt contract. *Spread* is All-in-Drawn spread in basis points charged by the bank over LIBOR for the drawn portion of the loan facility. *Maturity* is the maturity of the loan in months. *LoanSize* the size of the loan divided by firm assets in the year prior to entering into the loan contract (unscaled amounts in millions of dollars are shown in the table). *Revolver* is a dummy variable taking the value 1 if the loan type is a revolver and 0 otherwise. *PerfGrid* is a dummy variable taking the value 1 if performance pricing is included in loan covenants and 0 otherwise. *Collateral* is a dummy variable taking the value 1 if there exists a collateral requirement, and 0 otherwise. *CScore* is a measure of accounting conservatism developed by Khan and Watts (2009). *DefRisk* is a market-based measure of the firm's default probability as developed by Hillegeist, et al. (2004). *Asset* is a firm's total assets (# at) in millions of dollars. *MV* is a firm's market value of equity (stock price (# prcc_f) × share outstanding (# csho)) in millions of dollars. *TangAsset* is a firm's tangible assets, a measure developed by Berger et al. (1996) (unscaled amounts in millions of dollars are shown in the table). *Loss* is a dummy variable that takes the value 1 if a firm reports accounting losses in a year and 0 otherwise. *ROA* is the return on total assets, measured as income before extraordinary item (# ib) / total assets (# at). *CFVol* is cash flow volatility, measured by the standard deviation over the past 5 years of quarterly operating cash flows (# oancfy) / total assets (# atq). *Lev* is financial leverage, calculated as (long-term debt (# dlt) + debt in current liabilities (# dlcc)) / (stock price (# prcc_f) × share outstanding (# csho). *Growth* is the growth rate in a firm's total assets, measured as total assets (# at) / prior-year total assets (# at). *BM* is the book-to-market ratio, measured as common equity (# ceq) / (stock price (# prcc_f) × share outstanding (# csho). *StdPayout* is the standard deviation of abnormal payouts over the five years before loan initiation. We report t statistics associated with the paired sample t-tests of mean differences (two-tailed), and z statistics associated with the Wilcoxon signed-rank tests of median differences (two-tailed).

Variables	Regime I N	Regime I Mean	Regime I Median	Regime II N	Regime II Mean	Regime II Median	Mean Difference t-stat.	Median Difference z-stat.
PerfCov	1,936	0.540	0.538	1,940	0.502	0.502	-2.79***	-2.35**
SlackIndex	1,936	0.811	0.662	1,940	0.767	0.643	-1.36	-0.52
DivCov	1,936	0.733	1.000	1,940	0.582	1.000	-6.30***	-6.27***
GenCov	1,936	11.972	12.000	1,940	10.931	11.000	-9.59***	-9.49***
Spread	1,936	253.011	250.000	1,940	183.932	162.500	-10.79***	-12.43***
Maturity	1,936	47.561	48.000	1,940	50.177	45.500	0.14	-3.18***
LoanSize ($MM)	1,936	161.600	75.000	1,940	509.200	215.000	7.24***	13.67***
Revolver	1,936	0.589	1.000	1,940	0.578	1.000	-0.47	-0.47
PerfGrid	1,936	0.500	0.500	1,940	0.515	1.000	0.61	0.61
Collateral	1,936	0.767	1.000	1,940	0.500	0.500	-11.06***	-10.89***
CScore	1,936	1.233	0.172	1,940	1.088	0.113	-2.16**	-13.52***
DefRisk	1,936	0.074	0.001	1,940	0.059	0.000	-2.05**	-5.17***
Asset ($MM)	1,936	465.971	250.009	1,940	3,609.256	958.047	9.95***	17.49***
MV ($MM)	1,936	381.186	195.238	1,940	4,414.257	830.458	7.66***	16.74***
TangAsset ($MM)	1,936	183.082	104.696	1,940	1,492.416	381.007	9.75***	17.63***
Loss	1,936	0.257	0.200	1,940	0.215	0.000	-3.02***	-4.31***
ROA	1,936	0.025	0.037	1,940	0.016	0.041	-1.48	0.16
CFVol	1,936	0.043	0.035	1,940	0.034	0.027	-7.09***	-6.75***
Lev	1,936	0.262	0.253	1,940	0.261	0.239	-0.11	0.48
Growth	1,936	1.243	1.082	1,940	1.174	1.064	-3.00***	-1.82*
BM	1,936	0.757	0.599	1,940	0.653	0.470	-3.16***	-5.58***
StdPayout	1,936	6.773	0.864	1,940	1.662	0.185	-6.83***	-5.849***

Table 2
Correlation Matrix

Table 2 lists Pearson (Spearman) correlations below (above) the diagonal for the main variables defined in Table 1. Figures in bold indicate correlations that are significant at a 5% level or better.

		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
1	*PerfCov*	**1.00**	**0.06**	**0.58**	**0.77**	**0.20**	**0.21**	**0.21**	0.03	**0.48**	**0.39**	**0.12**	-0.03	**-0.10**	0.02	0.02	-0.04	**0.14**	**0.07**	0.02	**0.18**
2	*SlackIndex*	**0.07**	**1.00**	-0.05	**-0.11**	0.01	-0.02	-0.04	0.01	-0.02	-0.03	-0.04	**0.06**	**-0.11**	0.04	**-0.09**	**-0.14**	**0.17**	0.01	-0.05	0.03
3	*DivCov*	**0.59**	-0.05	**1.00**	**0.74**	**0.27**	**0.15**	**0.22**	**0.09**	**0.45**	**0.49**	**0.21**	**0.06**	0.04	**0.11**	**-0.07**	**0.07**	0.05	0.03	**0.08**	**0.15**
4	*GenCov*	**0.79**	**-0.12**	**0.74**	**1.00**	**0.40**	**0.17**	**0.23**	0.05	**0.42**	**0.67**	**0.32**	**0.07**	0.03	**0.15**	**-0.09**	**0.09**	**0.07**	0.02	**0.14**	**0.22**
5	*Spread*	**0.15**	0.02	**0.22**	**0.32**	**1.00**	0.04	**0.14**	**-0.08**	**-0.13**	**0.57**	**-0.06**	**0.33**	**0.06**	**0.49**	**-0.46**	**0.22**	**0.20**	**-0.11**	**0.27**	**0.35**
6	*Maturity*	0.02	0.02	0.02	0.02	-0.01	**1.00**	**0.20**	**0.06**	**0.13**	**0.14**	0.01	**-0.13**	**-0.13**	**-0.07**	**0.08**	**-0.18**	**0.19**	**0.10**	**-0.08**	0.03
7	*LoanSize*	**0.15**	-0.05	**0.17**	**0.16**	**0.08**	0.00	**1.00**	**0.28**	**0.19**	**0.18**	**0.21**	**-0.06**	**0.07**	-0.04	**0.11**	**0.16**	-0.05	**0.08**	0.04	**-0.08**
8	*Revolver*	0.03	0.01	**0.09**	**0.06**	**-0.12**	0.02	**0.21**	**1.00**	**0.21**	0.02	0.05	-0.03	**0.11**	0.01	0.03	**0.08**	**-0.15**	-0.01	**0.07**	**0.07**
9	*PerfGrid*	**0.50**	-0.02	**0.44**	**0.42**	**-0.19**	0.02	**0.13**	**0.20**	**1.00**	**0.13**	**-0.08**	-0.05	-0.02	**-0.12**	**0.11**	-0.05	0.01	0.05	0.02	-0.05
10	*Collateral*	**0.39**	-0.05	**0.49**	**0.65**	**0.50**	-0.01	**0.15**	0.01	**0.11**	**1.00**	**0.45**	**0.18**	**0.07**	**0.34**	**-0.27**	**0.19**	**0.08**	-0.04	**0.17**	**0.11**
11	*CScore*	**0.12**	-0.05	**0.18**	**0.27**	-0.05	0.01	**0.15**	0.02	**-0.09**	**0.39**	**1.00**	**0.36**	**0.08**	**0.36**	**-0.43**	**0.20**	**0.21**	**-0.21**	**0.47**	**0.13**
12	*DefRisk*	-0.01	**0.07**	**0.06**	0.04	**0.32**	-0.01	-0.05	-0.03	**-0.06**	**0.14**	**0.37**	**1.00**	0.00	**0.29**	**-0.42**	0.04	**0.22**	**-0.41**	**0.40**	**0.19**
13	*LnAsset*	**-0.11**	**-0.11**	0.03	0.02	0.04	0.00	0.05	**0.11**	-0.04	**0.07**	0.05	-0.04	**1.00**	**0.08**	**0.07**	**0.36**	**-0.34**	0.01	0.03	**-0.13**
14	*Loss*	-0.03	**0.06**	**0.10**	**0.11**	**0.45**	-0.02	-0.02	0.01	**-0.15**	**0.33**	**0.33**	**0.29**	**0.09**	**1.00**	**-0.55**	**0.16**	**0.08**	**-0.21**	**0.08**	0.03
15	*ROA*	**0.11**	**-0.08**	-0.05	-0.02	**-0.38**	0.01	**0.06**	0.01	**0.15**	**-0.22**	**-0.28**	**-0.30**	**-0.08**	**-0.54**	**1.00**	0.02	**-0.26**	**0.38**	**-0.34**	0.05
16	*CFVol*	-0.04	**-0.13**	**0.06**	**0.07**	**0.17**	-0.01	**0.16**	**0.08**	**-0.07**	**0.16**	**0.14**	0.01	**0.30**	**0.15**	**-0.13**	**1.00**	**-0.32**	0.06	0.00	**0.20**
17	*Lev*	**0.14**	**0.18**	**0.06**	**0.08**	**0.20**	0.01	-0.04	**-0.15**	0.00	**0.10**	**0.30**	**0.25**	**-0.35**	**0.08**	-0.05	**-0.25**	**1.00**	-0.01	0.01	-0.04
18	*Growth*	**0.07**	**0.06**	0.05	0.03	0.02	0.00	0.03	-0.05	-0.01	0.04	**-0.07**	**-0.16**	-0.05	-0.02	**0.16**	**0.06**	**0.07**	**1.00**	**-0.26**	**0.06**
19	*BM*	0.01	-0.04	**0.11**	**0.11**	**0.32**	-0.01	0.02	0.04	-0.04	**0.21**	**0.49**	**0.44**	0.04	**0.14**	**-0.19**	0.05	0.04	**-0.17**	**1.00**	**0.09**
20	*StdPayout*	**0.21**	0.04	**0.17**	**0.24**	**0.33**	0.02	**-0.06**	**0.06**	-0.04	**0.10**	**0.12**	**0.18**	**-0.14**	0.03	0.04	**0.21**	-0.04	**0.07**	**0.08**	**1.00**

Table 3
An OLS Regression Model of the Relation between Conservatism and Performance Covenants

Table 3 presents the OLS regression estimation of performance covenant restrictions on accounting conservatism for a sample of firms over the period 2000-2007. Regime I (II) refers to the high (low) information asymmetry regime. Regimes are classified based on the median value of the standard deviation of abnormal payouts, where observations in Regime I are above the median value, and observations in Regime II are below the median value. Variable definitions are given in Table 1. The t statistics are two-tailed and based on standard errors adjusted for clustering at the firm-level. The F-test compares the coefficients on *CScore* for the two sub-samples. *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

$$PerfCov_{i,t} = \alpha_0 + \alpha_1 CScore_{i,t-1} + \sum_{j=2}^{9} \alpha_j LoanControls_{i,t} + \sum_{j=10}^{14} \alpha_j FirmControls_{i,t-1} + \sum \delta_I Industry + \varepsilon_{i,t}$$

	Regime I		Regime II	
Variables	**Coef.**	**t-stat.**	**Coef.**	**t-stat.**
CScore	**0.323**	**2.76*****	**0.106**	**1.59**
LnMaturity	0.023	3.02***	0.030	4.25***
LoanSize	-0.011	-1.03	-0.003	-0.09
Spread	0.007	4.26***	0.002	2.54***
Revolver	-0.008	-1.10	-0.036	-3.35***
PerfGrid	0.104	7.45***	0.057	3.85***
Collateral	0.086	5.36***	0.090	4.94***
DivCov	-0.012	-0.76	-0.031	-1.34
GenCov	0.777	5.93***	0.894	6.90***
DefRisk	0.012	0.40	0.109	2.27**
LnAsset	-0.020	-4.08***	-0.010	-1.96*
ROA	0.073	1.54	0.142	2.18**
Growth	0.021	2.47**	0.018	1.11
CFVol	-0.525	-3.02***	-0.331	-1.29
Intercept	0.147	3.52***	0.082	1.47
Industry Dummies	YES		YES	
R^2	0.583		0.571	
N	1,936		1,940	
F-test on *CScore*	11.77***			

Table 4
The Signaling Role of Conservatism and Performance Covenants on Loan Spreads

Table 4 presents the OLS regression results of the loan spread on accounting conservatism and performance covenant restrictions for a sample of firms over the period 2000-2007. Regime I (II) refers to the high (low) information asymmetry regime. Regimes are classified based on the median value of the standard deviation of abnormal payouts, where observations in Regime I are above the median value, and observations in Regime II are below the median value. Variable definitions are given in Table 1. The t statistics are two-tailed and based on standard errors adjusted for clustering at the firm-level. The F-test compares the coefficients on *CScore*PerfCov* for the two sub-samples. *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

$$Spread_{i,t} = \lambda_0 + \lambda_1 CScore_{i,t-1} + \lambda_2 PerfCov_{i,t} + \lambda_3 CScore_{i,t-1} * PerfCov_{i,t} + \sum_{j=4}^{10} \lambda_j LoanControl_{i,t} + \sum_{j=11}^{16} \lambda_j FirmControl_{i,t-1} + \sum \delta_I Industry + \delta_{i,t}$$

	Regime I		Regime II	
Variables	**Coef.**	**t-stat.**	**Coef.**	**t-stat.**
CScore	-76.448	-1.76*	-22.412	-0.38
PerfCov	121.071	3.58***	15.481	1.11
CScore*PerfCov	**-48.885**	**-2.43****	**-9.821**	**-0.35**
LnMaturity	5.690	1.91*	9.597	2.67***
LoanSize	-0.010	-0.34	-0.042	-1.89*
Revolver	-45.611	-7.82***	-18.227	-3.99***
PerfGrid	-67.496	-7.67***	-29.901	-5.47***
Collateral	-58.743	-6.01***	-59.466	-6.31***
DivCov	1.095	1.13	-1.228	-0.40
GenCov	-7.553	-3.10***	-6.334	-3.26***
LnMV	-17.149	-5.21***	-24.714	-6.31***
DefRisk	84.881	4.22***	103.220	3.40***
ROA	-177.405	-6.35***	-186.981	-4.62***
CFVol	211.870	1.87*	61.855	0.61
Lev	53.135	2.31**	64.178	3.44***
Growth	22.620	3.55***	16.335	2.98***
Intercept	277.639	9.05***	242.674	7.48***
Industry Dummies	YES		YES	
R^2	0.347		0.484	
N	1,936		1,940	
F-test on *CScore*PerfCov*	33.79***			

Table 5
The Signaling Role of Conservatism and Performance Covenants on Future Wealth Appropriation

Table 5 presents Probit regression results of abnormal payouts to shareholders on conservatism and performance covenant restrictions for a sample of firms over the period 2000-2007. Regime I (II) refers to the high (low) information asymmetry regime. Regime I (II) refers to the high (low) information asymmetry regime. Regimes are classified based on the median value of the standard deviation of abnormal payouts, where observations in Regime I are above the median value, and observations in Regime II are below the median value. Variable definitions are given in Table 1. The z statistics are two-tailed and based on standard errors adjusted for clustering at the firm-level. The F-test compares the coefficients on *CScore*PerfCov* for the two sub-samples. *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

$$\text{Prob}(Transfer_{i,t+1}=1)=F(\kappa_0+\kappa_1 CScore_{i,t-1}+\kappa_2 PerfCov_{i,t}+\kappa_3 CScore_{i,t-1}*PerfCov_{i,t}$$
$$+\sum_{j=4}^{8}\kappa_j LoanControl_{i,t}+\sum_{j=9}^{14}\kappa_j FirmControl_{i,t-1}+\sum\delta_I Industry+\varepsilon_{i,t})$$

	Regime I			Regime II		
Variables	**Coef.**	**z-stat.**	**Marginal effect**	**Coef.**	**z-stat.**	**Marginal effect**
CScore	0.399	1.47	0.105	7.681	2.51***	0.464
PerfCov	-0.523	-1.65	-0.148	-0.427	-0.93	-0.046
CScore*PerfCov	**-0.945**	**-2.62*** **	**-0.250**	**-0.028**	**-0.73**	**-0.123**
Maturity	0.124	1.82*	0.033	0.065	0.73	0.004
LoanSize	0.300	1.17	0.079	1.164	2.80***	0.070
DivCov	0.204	1.38	0.052	0.034	0.12	0.002
GenCov	0.672	2.06**	0.177	0.681	1.84*	0.041
Revolver	-0.110	-1.81*	-0.029	-0.108	-1.71*	-0.016
DefRisk	0.091	0.32	0.024	1.180	1.60	0.071
ROA	1.391	2.65***	0.367	0.741	0.80	0.045
TangAsset	0.031	0.06	0.008	0.833	1.60	0.050
Loss	0.062	0.29	0.016	0.238	0.88	0.014
Growth	0.037	0.32	0.010	0.503	4.69***	0.030
BM	-0.004	-0.05	-0.001	-0.283	-0.74	-0.017
Intercept	-1.360	-3.29***		-3.706	-4.93***	
Industry Dummies	YES			YES		
Pseudo R^2	0.065			0.123		
N	1,936			1,940		
F-test on *CScore*PerfCov*	42.92***					

Table 6
Testing the Moral Hazard Explanation of Accounting Conservatism and Performance Covenants

Table 6 tests the moral hazard explanation of conservatism and performance covenants for a sample of firms over the period 2000-2007. Regime I (II) refers to the high (low) information asymmetry regime. Regimes are classified based on the median value of the standard deviation of abnormal payouts, where observations in Regime I are above the median value, and observations in Regime II are below the median value. We focus on Regime II sample only. Variable definitions are given in Table 1. Panel A presents changes in abnormal payout from before to after the debt contract initiation across terciles of *CScore* and *PerfCov*. Panel B (C) presents changes in CEO cash compensation (CEO wealth-performance sensitivity) from before to after the debt contract initiation across terciles of *CScore* and *PerfCov*. The t tests are conducted to see whether values are significantly different from zero. *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Panel A: Changes in Abnormal Payout from before to after the Debt Contract Initiation

	Low Tercile *CScore*	Middle Tercile *CScore*	High Tercile *CScore*
Low Tercile *PerfCov*	-0.065*	-0.042	0.027
Middle Tercile *PerfCov*	0.011	-0.014	-0.036
High Tercile *PerfCov*	-0.057*	-0.023	-0.021

Panel B: Changes in CEO Cash Compensation from before to after the Debt Contract Initiation

	Low Tercile *CScore*	Middle Tercile *CScore*	High Tercile *CScore*
Low Tercile *PerfCov*	-0.022	0.013	0.027
Middle Tercile *PerfCov*	0.015	-0.031	0.011
High Tercile *PerfCov*	-0.012	0.009	-0.011

Panel C: Changes in CEO Wealth-Performance Sensitivity from before to after the Debt Contract Initiation

	Low Tercile *CScore*	Middle Tercile *CScore*	High Tercile *CScore*
Low Tercile *PerfCov*	-1.243**	-0.542	0.308
Middle Tercile *PerfCov*	-0.613	-0.769*	-0.436
High Tercile *PerfCov*	-0.454	0.138	-0.125

Table 7
The Signaling Role of Conservatism and Covenants – Covenants Measured by a Covenant Slack Index

Table 7 replicates the analyses in Tables 3 through 5 with covenant restrictiveness measured by a covenant slack index (*SlackIndex*). Panels A presents the results of the OLS regression of the covenant slack index on accounting conservatism. Panel B presents results of the OLS regression of the loan spread on conservatism and covenants. Panel C presents the results of the Probit regression of abnormal payouts to shareholders on conservatism and covenants. Variable definitions are given in Table 1. The t statistics and z statistics are two-tailed and based on standard errors adjusted for clustering at the firm-level. The F-test compares the coefficients of the main test variables for the two sub-samples. *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Panel A: An OLS Regression Model of the Relation between Conservatism and Performance Covenants (Equation (1))

	Regime I		Regime II	
Variables	**Coef.**	**t-stat.**	**Coef.**	**t-stat.**
CScore	**0.427**	**2.96*** **	**0.082**	**0.47**
Control Variables	YES		YES	
Industry Dummies	YES		YES	
R^2	0.369		0.343	
N	1,936		1,940	
F-test on *CScore*	10.77***			

Panel B: The Signaling Role of Conservatism and Performance Covenants on Loan Spreads (Equation (2))

	Regime I		Regime II	
Variables	**Coef.**	**t-stat.**	**Coef.**	**t-stat.**
CScore	-16.483	-1.16	-22.227	-1.38
SlackIndex	6.016	1.87*	-5.484	-1.18
CScore*SlackIndex	**-18.588**	**-2.73*** **	**-9.818**	**-1.51**
Control Variables	YES		YES	
Industry Dummies	YES		YES	
R^2	0.144		0.135	
N	1,936		1,940	
F-test on *CScore*SlackIndex*	7.39***			

Panel C: The Signaling Role of Conservatism and Performance Covenants on Future Wealth Appropriation (Equation (3))

	Regime I			Regime II		
Variables	**Coef.**	**z-stat.**	**Marginal effect**	**Coef.**	**z-stat.**	**Marginal Effect**
CScore	0.396	1.42	0.101	7.325	2.56***	0.428
SlackIndex	-0.328	-1.68*	-0.129	-0.223	-0.88	-0.024
CScore*SlackIndex	**-0.932**	**-2.22****	**-0.242**	**-0.047**	**-0.53**	**-0.073**
Control Variables	YES			YES		
Industry Dummies	YES			YES		
Pseudo R^2	0.086			0.124		
N	1,936			1,940		
F-test on *CScore*SlackIndex*	50.44***					

Table 8
A Switching Regression Model of the Relation between Conservatism and Covenants

Table 8 shows the results of the switching regression estimation with unknown sample separation for a sample of firms over the period 2000-2007. Parameters are estimated by simultaneous Maximum Likelihood. Regime I (II) refers to the high (low) information asymmetry regime. Variable definitions are given in Table 1. Panel A presents the two switching regime equations. Panel B presents the regime selection equation, with standard deviation of abnormal payout being the determinant of information asymmetry regimes. *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels (all two-tailed), respectively.

Panel A: The Switching Regime Regressions (Equations (4) and (5))

$$PerfCov_{1i,t} = \alpha_0 + \alpha_1 CScore_{i,t-1} + \sum_{j=2}^{9} \alpha_j LoanControls_{i,t} + \sum_{j=10}^{14} \alpha_j FirmControls_{i,t-1} + \sum \delta_T Year + \varepsilon_{i,t}$$

$$PerfCov_{2i,t} = \beta_0 + \beta_1 CScore_{i,t-1} + \sum_{j=2}^{9} \beta_j LoanControls_{i,t} + \sum_{j=10}^{14} \beta_j FirmControls_{i,t-1} + \sum \gamma_T Year + \nu_{i,t}$$

	Regime I		**Regime II**	
Variables	**Coef.**	**t-stat.**	**Coef.**	**t-stat.**
CScore	**0.025**	**2.03****	**-0.019**	**-1.36**
Control Variables	YES		YES	
Industry Dummies	YES		YES	
R^2	0.823		0.541	
N	3,876			

Panel B: The Regime Selection Equations (Equation (6))

$$Regime^{*}_{i,t} = \phi_0 + \phi_1 StdPayout_{i,t} + \mu_{i,t}$$

Variables	**Coef.**	**t-stat.**
StdPayout	4.379	2.88***
R^2	0.245	
N	3,876	