

# Accounting Conservatism and Performance Covenants: A Signaling Approach\*

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## ABSTRACT

This study examines the relation between performance covenants in private debt contracting and conservative accounting under adverse selection. We find that under severe adverse selection (i.e., high information asymmetry), accounting conservatism and performance covenants act as complements to signal that the borrower is unlikely to appropriate wealth from the lender. No such relation obtains in a 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 than borrowers with low levels of conservatism and loose performance covenants. Consistent with our signaling theory, in the high information asymmetry regime, borrowers with high levels of conservatism and tight performance covenants are less likely to make abnormal payouts to shareholders. Our empirical results are robust to alternative measures of conservatism and covenant restrictiveness.

## Prudence comptable et clauses restrictives liées à la performance : une théorie de la signalisation

### RÉSUMÉ

Les auteurs étudient la relation entre les clauses restrictives liées à la performance dans les contrats d'emprunt sur le marché privé et la prudence comptable en situation d'antisélection. Ils constatent que lorsque l'antisélection est marquée (c'est-à-dire lorsque l'asymétrie de l'information est importante), la prudence comptable et les clauses restrictives liées à la performance jouent des rôles complémentaires dans le signalement du fait

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que l'emprunteur est peu susceptible de s'enrichir aux dépens du prêteur. Aucune relation de cette nature n'est observée en situation de faible asymétrie de l'information. Les auteurs montrent au surplus que lorsque l'asymétrie de l'information est importante, les emprunteurs qui affichent des niveaux élevés de prudence et sont assujettis à des clauses restrictives rigoureuses en matière de performance bénéficient généralement d'écarts de taux d'intérêt moins grands que les emprunteurs dont les niveaux de prudence sont faibles et qui sont assujettis à des clauses restrictives peu exigeantes en matière de performance. Conformément à leur théorie de la signalisation, les auteurs constatent qu'en situation d'asymétrie de l'information importante, les emprunteurs qui affichent des niveaux élevés de prudence et sont assujettis à des clauses restrictives rigoureuses en matière de performance sont moins susceptibles de procéder à des distributions anormales aux actionnaires. Les résultats empiriques de l'étude résistent aux différentes mesures de la prudence et de la rigueur des clauses restrictives.

## 1. Introduction

This study examines the private debt-contracting relation between performance covenants and conservative accounting under asymmetric information (i.e., adverse selection). We characterize information asymmetry as lenders being less informed than borrowers about the latter's potential wealth appropriation proclivities (borrower type) through excessive payouts.<sup>1</sup> We explore the implications of this adverse selection on the relation between conservative accounting and performance covenants in the lending process.

In this setting, absent signaling by borrowers about their type, lenders will price protect themselves by charging a pooling interest rate to all borrowers based on lenders' prior assessment of borrowers' average tendency to appropriate wealth. Thus, Good borrowers with low wealth appropriation proclivities benefit from revealing their type by using costly signals in exchange for lower borrowing rates. In our signaling environment, high levels of conservatism and tight covenants can serve as such 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. The cost is higher for Bad borrowers with high wealth appropriation proclivities should they mimic the same combination of signals. Specifically, they lose gains from wealth appropriation when lenders are in control. This asymmetric cost function helps to ensure that Bad borrowers do not mimic Good borrowers. The effectiveness of these costly signals depends on the extent to which the asymmetric cost function discriminates between Good and Bad borrowers. As the prior literature documents, accounting conservatism and covenants reinforce each other in triggering covenant violations and thus can serve as complementary signals (Zhang 2008; Beatty, Weber, and Yu 2008; Nikolaev 2010). Therefore, Good borrowers will use a combination of covenants and conservative accounting signals to optimally deter the Bad.

Conceptually, the relation between accounting conservatism and covenants is conditioned upon the degree of information asymmetry. As discussed above, in a high information asymmetry regime, conservative accounting and covenants are complements to the

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1. 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 proprietary, leading to an adverse-selection problem. This type of adverse selection is also modeled in Garleanu and Zwiebel (2009).

Good borrowers to signal their type.<sup>2</sup> In contrast, lenders know borrower type well in a low information asymmetry environment so there is no need for Good borrowers to incur either costly signal. Therefore, we posit that conservative accounting and performance covenants are positively associated in a high information asymmetry regime (for signaling purposes), and that this association is weaker in a low information asymmetry regime.

We directly measure the degree of information asymmetry with respect to borrowers' wealth appropriation proclivities using 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. We partition our sample into subsamples based on above- versus below-median degree of information asymmetry. Using private debt data, we find that conservative accounting is positively related to the tightness of performance covenants in the high information asymmetry regime. Furthermore, this relation becomes weaker and insignificant in the low information asymmetry regime.

We document other results that corroborate our conceptualization of the relation between covenants and accounting conservatism in private debt contracting. Specifically, we show that the combination of more conservative financial reporting *and* more restrictive covenants reduces the cost of debt in the high information asymmetry regime. In contrast, we find weaker or insignificant value for adopting conservative accounting *and* performance covenant restrictions when the firm is in the low information asymmetry regime. In addition, we use 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.

Our approach differs from prior literature on two important dimensions. First, we explicitly consider the role of adverse selection in the private debt-contracting setting. Prior empirical studies find a positive association between covenants and conservatism (Beatty et al. 2008; Nikolaev 2010),<sup>3</sup> and our study extends them by showing that this effect is confined to a high information asymmetry setting. Second, in addition to the view of conservatism based on moral hazard, we propose a signaling role for conservatism (in combination with covenants) in an adverse-selection setting. Since the positive relation between conservatism and covenants could also be attributed to a moral hazard explanation, we try to distinguish the two explanations by three analyses. Because a defining feature of moral hazard theory pertains to agents' actions, we focus on *changes* in abnormal payouts and compensation structure around loan initiations. First, around loan initiations, we do not find either a larger decrease in abnormal payouts for firms with a higher degree of conservatism and tighter covenants, or a larger increase in abnormal payouts for firms exhibiting a lower degree of conservatism and looser covenants. Second, we find that CEO's cash compensation and wealth-performance sensitivity do not change significantly around debt contract initiations. Third, we find that the positive relation between accounting conservatism and covenants become more pronounced in a subgroup of loans without

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2. In a setting *without* information asymmetry, Gigler, Kanodia, Sapiro, and Venugopalan (2009) show that accounting conservatism and covenants are substitutes. We extend the baseline model of Gigler et al. by introducing information asymmetry between borrowers and lenders about borrowers' wealth appropriation proclivity, and demonstrate the theoretical underpinnings of a complementary relation between accounting conservatism and covenants in the presence of information asymmetry. We present the intuitive argument here. The model is available upon request.
  3. 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.

credit ratings where adverse-selection is severer. Although we cannot conclusively rule out the moral hazard explanation, the combined evidence suggests that adverse selection rather than moral hazard is the operative driver of the conservatism-covenant relation in our setting.

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.

The remainder of the article is organized as follows. Section 2 motivates the adverse selection view of wealth appropriation 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.

## 2. Motivation and hypotheses development

### *Wealth appropriation*

Debt covenants are contractual features that protect creditors from activities, such as excessive dividend payments and risk shifting investments, that transfer wealth from them to shareholders (Smith and Warner 1979). Many accounting and finance researchers have studied the size, costs, and consequences of wealth appropriation by borrowers through dividends and the effectiveness of contractual cures (e.g., Jensen and Meckling 1976; Smith and Warner 1979; Kalay 1982; Jensen 1986; Healy and Palepu 1990; Long, Malitz, and Sefcik 1994; Gjesdal and Antle 2001; Douglas 2003; Brockman and Unlu 2009). Their findings suggest that dividend policy significantly affects the agency cost of debt, and dividend covenants cannot completely mitigate this cost.

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 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 nonbinding restrictions (Kalay 1982), so that explicit dividend restrictions do not fully resolve the creditor-shareholder conflict regarding payout policies.

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). 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; Dou 2014). 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, high information asymmetry between lenders and borrowers likely exacerbates the difficulties that creditors face in screening and monitoring borrowers (e.g., Bharath, Dahiya, Saunders, and Srinivasan 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.

### *Hypotheses development*

Although loan officers are informed by credit-relevant information and experience with clients, potential borrowers usually know more about 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 *ex ante* for the inferred amount of wealth appropriation activity.

Consider a firm (or borrower) that has exclusive rights to a debt-financed project that can ultimately generate a stochastic output. In the interim, the firm's accounting system produces an imperfect report about this output. After the report is released, the firm has the option to either continue the project, or liquidate the project. A potential conflict of interest arises between the borrower and lender due to the asymmetric payoffs they will receive from the project—a low accounting report would indicate that the output is likely to be low, making liquidation appealing to the lender, while the borrower is still interested in continuing the project because of her limited liability. This creates a need for debt covenants that specify the conditions under which the decision right is transferred from the borrower to the lender. Inefficiency could arise when the outcome is actually high if the project is continued, but the accounting system generates a low report that violates the covenants, and as a result, the project is falsely liquidated. Accounting conservatism and covenants interact in the following manner in generating such inefficiency: for any given level of output (i) holding conservatism constant, tighter covenants are more likely to be violated, and (ii) holding covenants constant, a higher level of conservatism makes it more likely for the accounting system to generate a low report, and thus increases the likelihood of covenants violation. Both scenarios may cause a solid project to be terminated prematurely. The same reasoning applies to simultaneously increasing both levels of conservatism and covenants.

Borrowers are distinguished by those who do not overly engage in wealth appropriation activity (Good) and those that do (Bad). When the information asymmetry about borrower type is high (the high information asymmetry regime), lenders have difficulty in telling Good borrowers from Bad borrowers and will price protect themselves by charging an average (pooled) interest rate. This provides Good borrowers with an incentive to distinguish themselves from Bad borrowers and obtain a lower interest rate by offering a combination of conservative accounting and covenant signals. Both mechanisms are costly to borrowers as they increase the likelihood that a restrictive covenant will be violated, resulting in transfer of control rights from borrowers to lenders.<sup>4</sup> The cost is particularly

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4. Here, we assume for 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 borrowers' willingness to distinguish themselves from the Bad by initially submitting to more conservative reporting and tighter covenants and renegotiate better terms later on. In contrast, Bad borrowers are unable to mimic such a strategy as creditors will set more stringent terms in the renegotiation. Thus, our conceptual argument provides a lower bound for the signaling role of conservatism in a private debt-contracting setting.

high for Bad borrowers if they try to mimic the same combination of signals. Specifically, they lose the gain from the wealth appropriations on top of the costs that all borrowers (Good and Bad) would incur when lenders take control. This asymmetric cost function ensures that Bad borrowers do not mimic the Good.

Note that giving lenders too much control rights hurts borrowers, as lenders may liquidate projects prematurely to secure their claims (Aghion and Bolton 1992). 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. The effectiveness of the signals depends on the extent to which they impose asymmetric costs on and thereby distinguish between Good and Bad borrowers.

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).<sup>5</sup> 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 in discriminating between Good and Bad borrowers and have to be very restrictive. When conservatism can also be used to signal borrower type, covenants need not be overly restrictive, reducing overall signaling costs. Moreover, prior literature shows that accounting conservatism and covenants reinforce each other's power to trigger covenant violations which are precisely more costly for Bad borrowers (Zhang 2008; Beatty et al. 2008; Nikolaev 2010). A combination of covenants and conservative accounting optimally deters the Bad from mimicking the Good. In this sense, conservative accounting and covenants display a positive association 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 borrowers with a high probability, and set different contracting terms accordingly. Therefore, Good borrowers need not to resort to costly signaling mechanisms (conservative reporting and tight covenants).<sup>6</sup> Thus, in the low asymmetric information environment, there should be a weaker or no relation between covenants and conservative accounting. The above discussion leads to the following formal hypothesis concerning the relation between conservatism and covenants stated in the alternative form:

*HYPOTHESIS 1: Conservative accounting and performance covenants are strongly (weakly) positively associated in the high (low) information asymmetry regime.*

5. 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.

6. In the cross section, when information asymmetry is low, there could be a small number of Good borrowers misclassified as Bad by creditors. These Good 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.

When the information asymmetry about borrower type is high, Good borrowers want 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 covenants. However, with low information asymmetry, creditors are generally able to distinguish Good borrowers from the Bad, and offer contract terms that are designed for each type. There is basically no need for borrowers to undertake costly signaling behavior. Hence, we expect loan spreads to be more weakly or even not associated with high levels of conservatism *and* covenants in the low information asymmetry regime relative to the high information asymmetry regime. The above discussion yields the following hypothesis:

*HYPOTHESIS 2: For borrowers in the high (low) information asymmetry regime, conservative accounting and tight covenants are associated strongly (weakly) with lower loan spreads.*

Another implication of our analysis is that Good borrowers in the high information asymmetry regime will tend not to appropriate wealth at the expense of their debtholders. In contrast, we expect a weaker or no relation between the combination of high levels of conservatism *and* tight covenants and wealth transfers for borrowers in the low information asymmetry regime. We formulate the hypothesis with reference to excess dividends and stock repurchases.

*HYPOTHESIS 3: Under the high (low) information asymmetry regime, borrowers with high levels of conservative accounting and tight covenants are unlikely (less likely) to make future wealth transfers from debtholders to themselves in the form of excess dividends and stock repurchases.*

### ***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 borrowers to opportunistically report less conservative accounting numbers after signing debt contracts. As a validation check, we examine changes in accounting conservatism before and after signing of debt contracts. Consistent with our expectation, we find that the levels of borrowers' conservatism did not change significantly around loan initiations (see Additional empirical tests).

### **3. Research design**

#### ***Measures of accounting conservatism***

We use Khan and Watts's (2009) *C*Score as the primary measure of accounting conservatism. This measure is based on Basu's (1997) asymmetric timeliness estimation.<sup>7</sup> Specifi-

7. See recent work (Ball, Kothari, and Nikolaev 2013a,b) on the validity of Basu's asymmetric timeliness coefficient, which is an important input for Khan and Watts's (2009) conservatism measure.

cally, we estimate the following annual cross-sectional regression:

$$\begin{aligned} \text{Earnings}_i = & \beta_1 + \beta_2 D_i + R_i(\mu_1 + \mu_2 \text{LnMV}_i + \mu_3 M/B_i + \mu_4 \text{Lev}_i) \\ & + D_i R_i(\lambda_1 + \lambda_2 \text{LnMV}_i + \lambda_3 M/B_i + \lambda_4 \text{Lev}_i) \\ & + (\delta_1 \text{LnMV}_i + \delta_2 BM_i + \delta_3 \text{Lev}_i + \delta_4 D_i \text{LnMV}_i + \delta_5 D_i BM_i + \delta_6 D_i \text{Lev}_i) + \varepsilon_i, \end{aligned}$$

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; *BM* 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.<sup>8</sup> 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), an earnings skewness measure (*Skewness*), and *CScore* calculated using quarterly data. We do not use conservatism measures that capture unconditional conservatism because unconditional conservatism does not enhance debt-contracting efficiency (Ball and Shivakumar 2005, 2006).

### *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).<sup>9</sup> Among financial covenants, Christensen and Nikolaev (2012) distinguish between (i) 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 (ii) 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 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 Additional empirical tests for a placebo 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 account-

8. We choose net income before extraordinary items and the market-to-book ratio following Khan and Watts (2009). While using net income likely yields a more powerful measure of conservatism (Basu 1997; Pope and Walker 1999), Li (2010) finds that the extraordinary items are normally excluded in contracting measurement rules. Furthermore, the market-to-book ratio is only valid for observations with positive book values. Nevertheless, using net income and book-to-market measures does not alter our inferences.

9. Bradley and Roberts (2004) report that 84 percent 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.



ing 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 (Demerjian and Owens 2014). 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. Beatty and Weber (2006) also used the rank measure of covenant slacks.

### ***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 loan initiation. Abnormal payouts to shareholders represent firms' wealth appropriation activities. We estimate abnormal payouts as follows. First, following Boudoukh, Michaely, Richardson, and Roberts (2007), we calculate total payout as dividends (# *dvc*) plus repurchases (total expenditure on the purchases of common and preferred stock (# *prstk*) plus any reduction in the value of the net number of preferred stock outstanding (# *pstkrv*)). Following Grullon, Paye, Underwood, and Weston (2011) and Banyl, 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, Spindt, and Subramaniam (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.<sup>10</sup>

### ***Testing Hypothesis 1: Does conservatism correlate with covenants differently 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.

10. The residual following this approach might include contractual redemptions of mandatorily redeemable preferred stock (MRPS), which would be predictable. We use the Capital IQ debt structure database to identify mandatorily redeemable preferred stocks and verify whether these preferred stocks indeed are mandatorily redeemable by going through the firm's 10-K, 10-Q, or 8-K filings. For years prior to 2001, we follow Gunderson, Chiao, and Swanson (2013) by searching 10-K reports of our sample firms using keywords such as "trust preferred" and "mandatorily redeemable." If either the amount or the maturity date is missing, we delete the observation. Consequently, we identify 13 MRPS and we subtract the mandatorily redeemable amount from our measure of abnormal payouts in the maturity year. No inferences are affected.

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 high (low) information asymmetry regime. We estimate the following pooled cross-sectional time-series regression separately for firms residing in the high and low information asymmetry regimes:

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

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 (1). Loan and firm characteristics are discussed in Controls for loan and firm characteristics. We measure our control variables at the beginning of year  $t$  (i.e., the end of year  $t - 1$ ). Industry dummies are also included to control for unobservable industry-specific factors following the industry classification of Barth, Hodder, and Stubben (2008). 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.

To test our first hypothesis, we focus on  $\alpha_1$ . In our signaling framework,  $\alpha_1$  should be interpreted as a partial correlation coefficient. In other words,  $\alpha_1$  should not be interpreted to mean that a one unit exogenous increase in  $CScore$  leads to a change of  $\alpha_1$  units in  $PerfCov$ . Rather, according to the signaling framework,  $\alpha_1$  indicates that when borrowers with lower propensity to expropriate lenders' wealth (the Good) adopt one more unit of  $CScore$ , they will also accept  $\alpha_1$  more units of  $PerfCov$ . This interpretation also applies to the coefficients on  $CScore \times PerfCov$  in the equations that follow.

### ***Testing Hypothesis 2: Do conservatism and covenants affect loan spreads differently under alternative information asymmetry regimes?***

Hypothesis 2 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:

$$Spread_{i,t} = \lambda_0 + \lambda_1 CScore_{i,t-1} + \lambda_2 PerfCov_{i,t} + \lambda_3 CScore_{i,t-1} \times PerfCov_{i,t} + \sum_{j=4}^{10} \lambda_j LoanControls_{i,t} + \sum_{j=11}^{16} \lambda_j FirmControls_{i,t-1} + \sum \delta_I Industry + \varepsilon_{i,t}, \quad (2)$$

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.<sup>11</sup> Our main focus here is on the coefficient estimates for the interaction parameter  $\lambda_3$ . We expect  $\lambda_3$  to be negative in the high information asymmetry regime, but smaller (less negative) or insignificant in the low information asymmetry regime (Hypothesis 2). We also control for loan-specific and firm-specific variables. We adjust standard errors by clustering at the firm level.

11. 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.

**Testing Hypothesis 3: are borrowers who signal conservatism and covenants less likely to appropriate wealth?**

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

$$\begin{aligned} Prob(Transfer_{i,t+1} = 1) = & F(\kappa_0 + \kappa_1 CScore_{i,t-1} + \kappa_2 PerfCov_{i,t} + \kappa_3 CScore_{i,t-1} \times PerfCov_{i,t} \\ & + \sum_{j=4}^8 \kappa_j LoanControls_{i,t} + \sum_{j=9}^{14} \kappa_j FirmControls_{i,t-1} \\ & + \sum \delta_I Industry + \varepsilon_{i,t}). \end{aligned} \quad (3)$$

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 debtholders, and 0 otherwise. In this study, we measure wealth appropriation by abnormal payouts (discussed in Determinants of information asymmetry regimes). Specifically, firm-year observations predicted not to pay out but with an actual positive total payout are coded as abnormal payout observations ( $Transfer_{i,t+1}$ ). For all the other observations  $Transfer_{i,t+1}$  is assigned a value of zero. Our inferences are not affected by deleting observations predicted to payout but with zero actual total payouts.

Our main variable of interest is the interaction term  $CScore \times PerfCov$  in (3). Hypothesis 3 predicts a negative coefficient  $\kappa_3$  for  $CScore \times PerfCov$  in the high information asymmetry regime, and a smaller coefficient for  $CScore \times PerfCov$  in the low information asymmetry regime relative to the high information asymmetry regime.

**Controls for loan and firm characteristics**

We follow prior studies, including Beatty et al. (2008) and Bharath, Sunder, and Sunder (2008), in controlling for loan and firm characteristics in (1)–(3). The detailed variable definitions are in the Appendix. Variables related to loan characteristics include loan maturity, loan size, the performance pricing indicator, the interest rate spread over LIBOR, the existence of collateral, the existence of dividend restriction covenants, the number of general covenants, and an indicator variable for whether the loan is of the revolving type.<sup>12</sup>

We also control for the following firm-level variables in (1): a proxy for default risk, firm size, return on assets, asset growth, and cash flow volatility. Firm controls in (2) include market value, the default risk proxy, cash flow volatility, financial leverage, and the book-to-market ratio. In (3), because we use an extensive array of firm characteristics to derive abnormal payouts, we limit ourselves to a parsimonious number of firm characteristics, namely, default risk, return on assets, tangible assets, accounting losses, asset growth, and the book-to-market ratio. In addition, in estimating (3), we control for the following loan characteristics: loan maturity, loan size, the existence of dividend restriction covenants, the number of general covenants, and the existence of revolving loans.

12. 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.

#### 4. Data sources and main results

##### *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.

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.<sup>13</sup> 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. The default risk data are not available for some borrowers, so our final sample consists of 2,938 loan deals (4,012 loan facilities) and 1,302 borrowers. The resulting panel of loans is fairly evenly distributed across the sample period.

##### *Descriptive statistics*

Table 1 reports the mean and median values, as well as standard deviation values, for variables used in the multivariate regressions after winsorizing all continuous variables at the top and bottom 1 percent. The two subsamples of high and low information asymmetry regimes 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.

We also provide the standard deviations of the variables for each regime in Table 1 because in our signaling framework, Good types should (should not) signal their proclivity for wealth appropriation in the high (low) information asymmetry regime. Consistent with this expectation, we observe higher standard deviations for most variables under the high information asymmetry regime relative to the low information asymmetry regime. Furthermore, our untabulated test shows that the standard deviation of  $CScore \times PerfCov$  is 0.169 for the high information asymmetry regime, which is significantly higher than the standard deviation of  $CScore \times PerfCov$  (=0.125) for the low information asymmetry regime.

We also calculate correlation coefficients among the accounting conservatism measure, covenant restrictions, and loan-level and firm-level characteristics for the full sample (untabulated). As expected, the performance covenant restrictiveness variable *PerfCov* is positively and significantly correlated with the covenant slack index (*SlackIndex*). 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 Nikolaev (2010), the collateral requirement and various measures of covenant restrictions are positively correlated.

13. We start from year 2000 because Ivashina (2009) shows that there is a significant improvement in Dealscan's coverage over 1993–2000.

TABLE 1  
Descriptive statistics

Variables	High information asymmetry regime (2,002 observations)			Low information asymmetry regime (2,010 observations)			Mean difference <i>t</i> -statistics	Median difference <i>z</i> -statistics
	Mean	Median	SD	Mean	Median	SD		
<i>PerfCov</i>	0.532	0.538	0.298	0.503	0.502	0.268	-3.24***	-2.38**
<i>SlackIndex</i>	0.812	0.661	0.425	0.765	0.642	0.382	-3.68***	-0.53
<i>DivCov</i>	0.731	1.000	0.722	0.586	1.000	0.473	-7.52***	-6.29***
<i>GenCov</i>	11.914	12.000	2.867	10.961	11.000	2.423	-11.36***	-9.51***
<i>Spread</i>	252.948	250.000	147.686	191.372	172.500	131.437	-13.94***	-12.42***
<i>Maturity</i>	47.808	48.000	41.766	49.939	47.000	37.659	1.69*	-3.19***
<i>LoanSize</i> (\$MM)	178.312	75.000	255.017	314.288	225.000	286.655	15.87***	13.65***
<i>Revolver</i>	0.583	1.000	0.493	0.573	1.000	0.495	-0.64	-0.48
<i>PerfGrid</i>	0.488	0.000	0.500	0.505	1.000	0.500	1.07	0.62
<i>Collateral</i>	0.752	1.000	0.432	0.519	1.000	0.545	-15.01***	-10.90***
<i>CScore</i>	1.231	0.172	0.421	1.069	0.115	0.325	-13.63***	-13.51***
<i>DefRisk</i>	0.075	0.001	0.151	0.066	0.000	0.162	-1.82*	-5.17***
<i>Asset</i> (\$MM)	522.935	250.100	3,823.868	3,547.196	929.344	6,780.329	17.41***	17.51***
<i>MV</i> (\$MM)	487.385	199.871	7,010.927	3,830.052	796.341	8,089.220	13.98***	16.76***
<i>TangAsset</i> (\$MM)	235.206	104.509	711.425	1,268.544	369.004	2,396.146	18.53***	17.65***
<i>Loss</i>	0.276	0.200	0.293	0.241	0.200	0.306	-3.70***	-4.32***
<i>ROA</i>	0.019	0.036	0.083	0.017	0.038	0.074	-0.80	0.16
<i>CFVol</i>	0.044	0.035	0.038	0.034	0.027	0.023	-10.07***	-6.77***
<i>Lev</i>	0.276	0.257	0.221	0.278	0.246	0.206	0.29	0.49
<i>Growth</i>	1.236	1.077	0.575	1.185	1.061	0.503	-2.99***	-1.82*
<i>BM</i>	0.699	0.555	0.978	0.593	0.451	0.726	-3.89***	-5.54***
<i>StdPayout</i>	6.292	0.872	3.947	2.374	0.195	2.122	-39.13***	-12.47***

**Notes:**

Table 1 presents descriptive statistics for the full sample of 4,012 observations over the period 2000–2007, separated by the high and low information asymmetry regimes. Variables are defined in the Appendix. 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). \*, \*\*, and \*\*\* indicate significance at the 10 percent, 5 percent, and 1 percent levels respectively.

**Conservatism and covenants under alternative information asymmetry regimes**

Table 2 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 within industry and scaled between 0 and 1. Our results are robust to using a limited-dependent variables model (Maddala 1991) instead. Results in Table 2 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, the coefficient on *CScore* is significantly lower for firms in the low information asymmetry environment.<sup>14</sup>

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 suggests that lenders require more performance covenants in response to higher agency costs.<sup>15</sup> Note that the coefficient on *CScore* is insignificant in the low information regime ( $t = 1.60$ ). To the extent that the agency cost explanation manifests in the low information asymmetry regime, we should also observe a significantly positive coefficient on *CScore* in that regime. We conjecture that the relation between *CScore* and *PerfCov* is weakened due to the control of agency costs. Consistent with our expectation, the coefficient on *CScore* becomes 0.165 ( $t = 1.85$ ) once we exclude *Spread* in the regression for the low information asymmetry subsample. Furthermore, an untabulated test shows that the difference in the coefficient on *CScore* between the two regimes is still significant ( $F$ -test statistic = 9.54).

### ***Signaling and loan spreads under alternative information asymmetry regimes***

Table 3 shows the effect of conservatism and performance covenants on loan spreads under alternative information asymmetry regimes as in (2). Our primary focus is on the coefficient for  $CScore \times PerfCov$ . 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 56.523 ( $= 47.835 \times [0.532 + 0.298] \times [1.231 + 0.421] - 47.835 \times [0.532 - 0.298] \times [1.231 - 0.421]$ ) basis points under the high information asymmetry regime. Relative to the mean spread (252.948) for the high information asymmetry regime, the incremental effect represents a 22 percent 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  $CScore \times PerfCov$  in the low asymmetry regime is insignificant and the difference in the coefficient across two regimes is significant, consistent with Hypothesis 2.

### ***Signaling and future wealth appropriation***

We test Hypothesis 3 using the probit regression specified in (3). Table 4 presents the coefficients and the marginal effects after Ai and Norton's (2003) correction on the interaction term. In the high information asymmetry regime, the marginal effect of  $CScore \times PerfCov$  is negative and significant. 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 30 percent ( $= 0.253 \times [0.532 + 0.298] \times [1.231 + 0.421] - 0.253 \times [0.532 - 0.298] \times [1.231 - 0.421]$ ) drop in the probability of being an abnormal

14. To test whether the coefficients on the main test variable across the two groups are statistically different, we create an indicator for each group and interact the indicator with all the explanatory variables, essentially pooling the data into one regression.

15. In general, analyzing separate design features of a debt contract while holding others constant could induce biased estimates as all the contractual terms are jointly determined. Our results in the high information asymmetry environment are robust to excluding all the debt contractual terms in (1). We acknowledge that the endogenous nature of the design of contractual terms renders the interpretation of regression coefficients less straightforward.

TABLE 2

An OLS regression model of the relation between conservatism and performance covenants

Variables	Predicted sign	High information asymmetry regime		Low information asymmetry regime	
		Coefficients	<i>t</i> -statistics	Coefficients	<i>t</i> -statistics
<i>CScore</i>	Positive High Regime; Insignificant/weaker Low Regime	0.325	2.78***	0.112	1.60
<i>LnMaturity</i>	+	0.026	3.05***	0.033	4.26***
<i>LoanSize</i>	+	-0.021	-1.05	-0.004	-0.11
<i>Spread</i>	+	0.001	4.28***	0.011	2.55***
<i>Revolver</i>	?	-0.014	-1.11	-0.037	-3.36***
<i>PerfGrid</i>	+	0.105	7.55***	0.058	3.78***
<i>Collateral</i>	+	0.084	5.34***	0.092	4.94***
<i>DivCov</i>	+	-0.014	-0.77	-0.044	-1.33
<i>GenCov</i>	+	0.766	5.91***	0.934	6.92***
<i>DefRisk</i>	+	0.015	0.41	0.112	2.28**
<i>LnAsset</i>	-	-0.022	-4.21***	-0.022	-1.95*
<i>ROA</i>	+	0.072	1.53	0.145	2.15**
<i>Growth</i>	?	0.024	2.44**	0.017	1.17
<i>CFVol</i>	?	-0.537	-3.06***	-0.327	-1.32
<i>Intercept</i>		0.148	3.56***	0.089	1.50
Industry dummies			Yes		Yes
<i>R</i> <sup>2</sup>			0.588		0.580
<i>N</i>			2,002		2,010
<i>F</i> -test on <i>CScore</i>			12.13***		

**Notes:**

Table 2 presents the OLS regression estimation of performance covenant restrictions on accounting conservatism for a sample of firms over the period 2000–2007. Regimes are classified based on the median value of the standard deviation of abnormal payouts, where observations in the high (low) information asymmetry regime are above (below) the median value. Variable definitions are given in the Appendix. 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.

payout observation ( $Transfer_{i,t+1} = 1$ ). By contrast, in the low information asymmetry regime, the marginal effect of  $CScore \times PerfCov$  is significantly lower than that in the high information asymmetry regime, consistent with Hypothesis 3. In an untabulated analysis, we confirm our results under a linear probability model.

**5. Additional tests and results*****Alternative explanation: Moral hazard***

In our adverse-selection signaling framework, Good 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. We attempt to distinguish signaling and moral hazard predictions empirically.

TABLE 3  
The signaling role of conservatism and performance covenants on loan spreads

Variables	Predicted sign	High information asymmetry regime		Low information asymmetry regime	
		Coefficients	<i>t</i> -statistics	Coefficients	<i>t</i> -statistics
<i>CScore</i>	–	–77.486	–1.78*	–22.448	–0.41
<i>PerfCov</i>	?	120.227	3.62***	15.449	1.13
<i>CScore</i> × <i>PerfCov</i>	Negative High Regime; Insignificant/weaker Low Regime	–47.835	–2.44**	–9.824	–0.34
<i>LnMaturity</i>	+	5.722	1.94*	9.596	2.69***
<i>LoanSize</i>	?	–0.015	–0.37	–0.045	–1.86*
<i>Revolver</i>	–	–45.631	–7.68***	–18.233	–3.68***
<i>PerfGrid</i>	–	–67.494	–7.64***	–29.482	–5.45***
<i>Collateral</i>	–	–58.739	–6.06***	–59.462	–6.34***
<i>DivCov</i>	–	1.088	1.15	–1.225	–0.53
<i>GenCov</i>	–	–7.536	–3.12***	–6.331	–3.27***
<i>LnMV</i>	–	–17.179	–5.24***	–24.710	–6.35***
<i>DefRisk</i>	+	84.814	4.26***	103.208	3.43***
<i>ROA</i>	–	–176.435	–6.43***	–185.942	–4.29***
<i>CFVol</i>	+	212.704	1.89*	61.853	0.64
<i>Lev</i>	+	53.333	2.35**	64.176	3.46***
<i>Growth</i>	+	22.632	3.61***	16.338	2.98***
<i>Intercept</i>		274.359	9.03***	242.675	7.50***
Industry dummies		Yes		Yes	
<i>R</i> <sup>2</sup>		0.342		0.463	
<i>N</i>		2,002		2,010	
<i>F</i> -test on <i>CScore</i> × <i>PerfCov</i>			34.65***		

**Notes:**

Table 3 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. Regimes are classified based on the median value of the standard deviation of abnormal payouts, where observations in the high (low) information asymmetry regime are above (below) the median value. Variable definitions are given in the Appendix. 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 subsamples. \*, \*\*, and \*\*\* indicate significance at the 10 percent, 5 percent, and 1 percent levels respectively.

First, according to the moral hazard explanation, we should expect a larger decrease in abnormal payouts around loan initiations for firms with a higher degree of conservatism and tighter covenants, or a larger increase in abnormal payouts for firms exhibiting a lower degree of conservatism and looser covenants. Neither is borne out empirically as shown in Table 5, panel A. In the high information asymmetry regime, for the sample firms whose *CScore* and *PerfCov* both reside in the top (bottom) tercile, we do not observe a statistically significant reduction (increase) in abnormal payouts from the year before the loan initiation to the year after. We further test whether there is a significant difference in changes in abnormal payout between firms whose *CScore* and *PerfCov* reside in the top vs. bottom terciles. A difference-in-differences test also yields insignificant results (*t* = 1.59).



TABLE 4

The signaling role of conservatism and performance covenants on future wealth appropriation

Variables	Predicted sign	High information asymmetry regime			Low information asymmetry regime		
		Coefficients	Marginal effect	z-statistics	Coefficients	Marginal effect	z-statistics
<i>CScore</i>	?	0.387	0.106	1.52	5.677	0.454	2.53***
<i>PerfCov</i>	?	-0.521	-0.149	-1.69*	-0.426	-0.051	-0.92
<i>CScore</i> × <i>PerfCov</i>	Negative High Regime; Insignificant/ weaker Low Regime	-0.958	-0.253	-2.54***	-0.029	-0.067	-0.65
<i>LnMaturity</i>	+	0.125	0.034	1.87*	0.066	0.006	0.76
<i>LoanSize</i>	+	0.312	0.084	1.13	1.165	0.074	2.80***
<i>DivCov</i>	-	0.213	0.054	1.39	0.037	0.004	0.14
<i>GenCov</i>	?	0.674	0.173	2.09**	0.685	0.043	1.85*
<i>Revolver</i>	?	-0.118	-0.030	-1.82*	-0.112	-0.020	-1.75*
<i>DefRisk</i>	+	0.095	0.025	0.41	1.185	0.077	1.61
<i>ROA</i>	?	1.388	0.358	2.66***	0.742	0.047	0.79
<i>TangAsset</i>	?	0.033	0.008	0.08	0.837	0.055	1.52
<i>Loss</i>	-	0.065	0.015	0.30	0.243	0.014	0.89
<i>Growth</i>	+	0.039	0.011	0.33	0.507	0.034	4.71***
<i>BM</i>	?	-0.007	-0.001	-0.07	-0.285	-0.017	-0.76
<i>Intercept</i>		-1.322			-3.038		
Industry dummies			Yes			Yes	
Pseudo $R^2$			0.068			0.127	
<i>N</i>			2,002			2,010	
<i>F</i> -test on <i>CScore</i> × <i>PerfCov</i>					42.66***		

**Notes:**

Table 4 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. Regimes are classified based on the median value of the standard deviation of abnormal payouts, where observations in the high (low) information asymmetry regime are above (below) the median value. Variable definitions are given in the Appendix. The z-statistics are two-tailed and based on standard errors adjusted for clustering at the firm-level. The interaction effect of the interaction term is presented following Ai and Norton (2003) correction. The *F*-test compares coefficients on *CScore* × *PerfCov* for the two subsamples. \*, \*\*, and \*\*\* indicate significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Second, we compare CEO compensation around loan initiations. Begley and Feltham (1999) show that large CEO cash compensation aligns the CEO's interests with debtholders, 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 debtholders. In other words, we should instead observe a shift in CEO compensation composition toward more equity holdings and less cash compensation. By

comparison, no prediction on the change in compensation structure can be made under the signaling explanation. Table 5, panels B and C show that changes in CEO cash compensation and CEO wealth-performance sensitivity (Edmans, Goldstein, and Jiang 2012) are insignificant for firms whose *CScore* and *PerfCov* both reside in the top tercile. The difference-in-differences tests also yield insignificant results ( $t = -1.40$  and  $-1.57$  respectively).

Third, we further partition our subsample of high information asymmetry based on whether the loan is rated by S&P or Moody's before each loan initiation. Prior research documents that loan ratings by third-party rating agencies effectively mitigate information asymmetry in the lending market (Sufi 2009). Thus, the presence of loan ratings should lead to lower signaling incentives. In untabulated tests, we find that our results in Table 3 become more pronounced in the subgroup without loan ratings. We also split the high information asymmetry subsample by whether the borrower's long-term debt is rated by S&P. Again the results confirm a more pronounced effect for the subgroup without a long-term debt rating, which does not support the moral hazard explanation.<sup>16</sup> Combined, the evidence suggests that signaling rather than moral hazard is the operative driver of the conservatism-covenant relation in this context.

### ***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 an untabulated robustness check, we replicate our results for the measure of overall tightness of performance covenants (*SlackIndex*). We find that the results are consistent with our Hypotheses 1–3.

### ***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 Riedl 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; Callen and Segal 2013). 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.

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

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

16. As a final check, we include firm fixed effects in our main regression (1) and find that our results disappear. To the extent that adverse selection (moral hazard) is primarily a cross-sectional (time-series) issue, this finding is consistent with our adverse-selection explanation.

TABLE 5  
Testing the moral hazard explanation of accounting conservatism and performance covenants

**Panel A:** Changes in abnormal payout from before to after the debt contract initiation

	Low tercile <i>CScore</i>	Middle tercile <i>CScore</i>	High tercile <i>CScore</i>	High versus low difference	<i>t</i> -statistics
Low tercile <i>PerfCov</i>	-0.066*	-0.043	0.028	0.094	1.93*
Middle tercile <i>PerfCov</i>	0.013	-0.014	-0.035	-0.047	-1.14
High tercile <i>PerfCov</i>	-0.054*	-0.025	-0.024	0.030	0.66
High versus low difference	0.012	0.018	-0.052	-0.064	1.59
<i>t</i> -statistics	0.43	0.51	-1.57		

**Panel B:** Changes in CEO cash compensation from before to after the debt contract initiation

	Low tercile <i>CScore</i>	Middle tercile <i>CScore</i>	High tercile <i>CScore</i>	High versus low difference	<i>t</i> -statistics
Low tercile <i>PerfCov</i>	-0.022	0.015	0.029	0.051	1.46
Middle tercile <i>PerfCov</i>	0.017	-0.033	0.012	-0.005	-0.14
High tercile <i>PerfCov</i>	-0.013	0.011	-0.011	0.002	0.07
High versus low difference	0.009	-0.004	-0.040	-0.049	-1.40
<i>t</i> -statistics	0.21	-0.10	-0.74		

**Panel C:** Changes in CEO wealth-performance sensitivity from before to after the debt contract initiation

	Low tercile <i>CScore</i>	Middle tercile <i>CScore</i>	High tercile <i>CScore</i>	High versus low difference	<i>t</i> -statistics
Low tercile <i>PerfCov</i>	-0.933**	-0.533	0.114	1.047	1.78*
Middle tercile <i>PerfCov</i>	-0.632	-0.772*	-0.434	0.198	0.25
High tercile <i>PerfCov</i>	-0.458	0.143	-0.128	0.330	0.39
High versus low difference	0.475	0.676	-0.242	-0.717	-1.57
<i>t</i> -statistics	0.84	1.42	-0.49		

**Notes:**

Table 5 tests the moral hazard explanation of conservatism and performance covenants for a sample of firms over the period 2000–2007. We focus on the sample residing in the high information asymmetry regime, defined as the observations above the median value of the standard deviation of abnormal payouts. Variable definitions are given in the Appendix. 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. We also report *t*-statistics associated with the paired subsample *t*-tests of mean differences between high and low groups, as well as *t*-statistics associated with difference-in-differences for subsample mean values. \*, \*\*, and \*\*\* indicate significance at the 10 percent, 5 percent, and 1 percent levels respectively.

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

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

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:

$$PerfCov_{i,t} = PerfCov_{1i,t} \quad \text{if } Regime_{i,t}^* > 0; \quad PerfCov_{i,t} = PerfCov_{2i,t} \quad \text{if } Regime_{i,t}^* \leq 0.$$

$Regime_{i,t}^*$  is a latent unobservable variable measuring the likelihood of being in the high (or low) information asymmetry regime. 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  $\psi$  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 (4–6) is greater (lower) than 0.5.

Table 6, 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 5 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.

### ***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 (un-tabulated). Results from our robustness checks are consistent with the related findings of Beatty et al. (2008) and Nikolaev (2010).

TABLE 6

A switching regression model of the relation between conservatism and covenants

**Panel A:** The switching regime regressions (equations (4) and (5))

Variables	Predicted sign	High information asymmetry regime		Low information asymmetry regime	
		Coefficients	<i>t</i> -statistics	Coefficients	<i>t</i> -statistics
<i>CScore</i>	Positive High Regime; Insignificant/weaker Low Regime	0.026	2.11**	-0.018	-1.38
Control variables			Yes		Yes
Industry dummies			Yes		Yes
$R^2$		0.831		0.552	
<i>N</i>			4,012		

**Panel B:** The regime selection equations (6)

Variables	Predicted sign	Coefficients	<i>t</i> -statistics
<i>StdPayout</i>	+	4.266	2.79***
$R^2$		0.249	
<i>N</i>			4,012

**Notes:**

Table 6 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. Variable definitions are given in the Appendix. 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.

*Controls for other demands of accounting conservatism*

Similar to Beatty et al. (2008), we first regress accounting conservatism on institutional ownership, litigation risk (Kim and Skinner 2012), and estimated corporate marginal tax rates from John Graham's website.<sup>17</sup> 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: the conservatism ratio of Callen et al. (2010), and *Skewness*, defined as minus one times the skewness in quarterly earnings (# nyq) (Basu 1995; Ball, Kothari, and Robin 2000; Basu and Markov 2004).<sup>18</sup> 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 use demeaned conservatism

17. See <https://faculty.fuqua.duke.edu/~jgraham/taxform.html>.

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

measures to facilitate the interpretation of the individual effect from *PerfCov*. Our inference remains the same.

#### *Controls for cross-default provisions*

Li, Lou, and Vasvari (2013) report that 95 percent of bank loans contain a cross-default provision. The tightness of loan covenants is potentially related to existing loans. We further control for the number of outstanding loans of the same borrower for each loan in our sample and no inference is affected.

#### *Role of relationship lending*

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' 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, Good borrowers can successfully separate themselves from Bad ones. 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 nonrelationship lenders.

#### *Replacing performance covenants with capital covenants as a placebo test*

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 debtholders. We complement extant research by revisiting the relation between accounting conservatism and debt covenants in a debt-contracting context where private debtholders 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 hypothesize 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 weakly related 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 an alternative view of conservatism based on moral hazard, where debtholders 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 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 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 with adverse selection. 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.

While our results suggest that a signaling framework helps to explain the positive relation between accounting conservatism and covenants, we cannot and do not conclude that this framework is the only or even the major explanation for such a relation in settings beyond the one (wealth appropriation by borrowers) that we focus on in this study.

## Appendix

### *Variable Definitions*

Variable	Definition (COMPUSTAT variables in parentheses)
<i>PerfCov</i>	The number of performance covenants in the loan contract, ranked within an industry on a scale from 0 to 1
<i>SlackIndex</i>	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 <i>Required</i> is the accounting ratio or number that has to be maintained as per the loan contract and <i>Actual</i> 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
<i>DivCov</i>	A dummy variable that equals 1 if the debt contract contains a dividend payout covenant restriction and 0 otherwise
<i>GenCov</i>	The number of general covenants in the debt contract
<i>Spread</i>	All-in-Drawn spread in basis points charged by the bank over LIBOR for the drawn portion of the loan facility
<i>Maturity</i>	The maturity of the loan in months. <i>LnMaturity</i> is the log of <i>Maturity</i>

(The Appendix is continued on the next page.)

## Appendix (continued)

Variable	Definition (COMPUSTAT variables in parentheses)
<i>LoanSize</i>	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 Table 1)
<i>Revolver</i>	A dummy variable taking the value 1 if the loan type is a revolver and 0 otherwise
<i>PerfGrid</i>	A dummy variable taking the value 1 if performance pricing is included in loan covenants and 0 otherwise
<i>Collateral</i>	A dummy variable taking the value 1 if there exists a collateral requirement, and 0 otherwise
<i>CScore</i>	A measure of accounting conservatism developed by Khan and Watts (2009)
<i>DefRisk</i>	A market-based measure of the firm's default probability as developed by Hillegeist, Keating, Cram, and Lundstedt (2004)
<i>Asset</i>	A firm's total assets (# at) in millions of dollars. <i>LnAsset</i> is the log of <i>Asset</i>
<i>MV</i>	A firm's market value of equity (stock price (# prcc_f) × share outstanding (# csho)) in millions of dollars. <i>LnMV</i> is the log of <i>MV</i>
<i>TangAsset</i>	A firm's tangible assets, calculated as $(\# che + 0.715 \times \# rect + 0.547 \times \# invt + 0.535 \times \# ppent)/\# at$ , following Berger, Ofek, and Swary (1996) (unscaled amounts in millions of dollars are shown in Table 1)
<i>Loss</i>	A dummy variable that takes the value 1 if a firm reports accounting losses in a year and 0 otherwise
<i>ROA</i>	The return on total assets, measured as income before extraordinary item (# ib)/total assets (# at)
<i>CFVol</i>	Cash flow volatility, measured by the standard deviation over the past 5 years of quarterly operating cash flows (# oancfy)/total assets (# atq)
<i>Lev</i>	Financial leverage, calculated as $(\text{long-term debt } (\# dlt) + \text{debt in current liabilities } (\# dlcc))/(\text{stock price } (\# prcc\_f) \times \text{share outstanding } (\# csho))$
<i>Growth</i>	The growth rate in a firm's total assets, measured as $\text{total assets } (\# at)/\text{prior-year total assets } (\# at)$
<i>BM</i>	The book-to-market ratio, measured as $\text{common equity } (\# ceq)/(\text{stock price } (\# prcc\_f) \times \text{share outstanding } (\# csho))$
<i>StdPayout</i>	The standard deviation of abnormal payouts over the 5 years before loan initiation

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