

The Relation Between Performance Pricing Covenants and Corporate Loan Spreads

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Abstract

We explore the relation between performance pricing covenants (PPCs) and corporate loan spreads through applying matching techniques to control for borrower characteristics. We find that accounting-based PPCs result in spreads that are significantly lower, while debt-rating-based PPCs result in spreads that are insignificantly different than matched elements without PPCs, a result that cannot be identified through estimating a pooled non-matched sample. Our results provide compelling evidence that estimating the effect of loan contract terms such as PPCs using pooled regressions can lead to estimating errors, and provide initial evidence that the spread advantage associated with PPCs are not universal.

1. Introduction

Performance pricing covenants (PPCs) in bank loans specify adjustments to the loan spread when some measure of the borrower's subsequent performance changes. PPCs differ across two dimensions, the metric for performance and the direction of the specified rate adjustment. Measures of performance can include accounting-based measures, such as the Debt-to-EBITDA ratio, or debt-ratings-based performance measures, such as the Moody or S&P rating of the borrower's bonds or commercial paper.

PPCs are of interest because they provide an opportunity to study the value of accounting information vs. debt ratings. Further, as an innovation in covenant design, PPCs represent an opportunity for further testing of the signaling theory of covenants developed by Gerleanu and Zwiebel (2006) and Demiroglu and James (2007).

Firms choosing accounting-based performance pricing have a greater preference for a more timely measure of credit risk (Doyle 2003). Such firms are riskier (have higher initial spreads over prime and greater volatility of credit risk during the loan's life), borrow at longer maturities, are smaller and are more likely to secure loans than do firms that choose performance pricing based on debt ratings. In contrast, firms choosing to structure performance pricing based on credit ratings are larger and also tend to have accounting numbers that require greater adjustment and are thus less suitable to simple rules in accounting-based performance pricing covenants. Accordingly, they prefer bond ratings as benchmark as these are considered to be a comprehensive measure of credit risk.

Turning to the second dimension, interest-increasing PPCs specify higher spreads should borrower credit quality decline offering automatic protection to the lending bank. Interest-decreasing PPCs provide for narrower spreads should credit quality improve. Since borrowers can prepay loans or renegotiate the rate in such circumstances, this type of PPC offers reduced transactions costs to both parties.

The central task of this paper is to measure the how the introduction of a performance pricing covenant influences loan spreads. In a close antecedent to our work, Asquith *et al.* employ a joint model of the decision to introduce either interest-increasing or interest-decreasing performance pricing and the LIBOR spread. Our tests differ from Asquith *et al.* (2005) in several respects. To start with, we are the first to measure separately the impact of performance pricing depending on whether it is accounting- or debt-rating-based. These tests initially pool both types of performance pricing and do not distinguish between interest-increasing and interest-decreasing. According to Doyle (2003), firms with accounting-based performance pricing have greater and more volatile credit risk, expected recontracting costs are higher for such firms and their lenders. Further, the greater volatility of credit risk for these borrowers increases the value of the lender's option (in the case of interest-increasing performance pricing). As a result, we hypothesize that performance pricing (whether interest-increasing or decreasing) should have a greater impact on the initial spread when it is accounting based.

Second, we reexamine the theoretical rationale given in Asquith *et al.* for distinguishing between interest-increasing and decreasing performance pricing focusing on the latter. That paper argues that because an interest-increasing PPC has value to the lender, the bank must compensate borrowers with a lower rate. They report a rate differential of just under 26 basis points. For interest-decreasing PPCs, Asquith *et al.* note that such contracts allow borrowers with improved credit quality to enjoy lower rates automatically without either side incurring the costs of loan prepayment or renegotiation. Because the benefit from lower costs may go to either side, they leave it to the empirical testing to determine the impact on spreads reporting an economically small and marginally significant, positive coefficient. The interpretation is that "borrowers may gain slightly more than lenders by decreasing the renegotiation costs" (p124).

Our separation of PPCs according to the measure of performance allows us to draw on Doyle (2003) for insight on how interest-decreasing PPC should impact spread. It is likely that for the higher risk firms choosing accounting-based performance pricing, bargaining power is low and that the main saving in recontracting costs goes to the lender. This suggests that interest-increasing performance pricing reduces the initial spread. Put another way, for accounting-based PPC, we hypothesize that introduction of PPC reduces spread regardless of whether it is interest-increasing or decreasing.

Examining PPC design in the context of Demiroglu and James (2007) on covenant design as a signaling mechanism reinforces our hypothesis. In their framework, borrowers have private information about their future prospects. By accepting loan terms with tight covenants, the borrower signals that it believes its financial state will improve. They find that firms with tight covenants display stronger future operating performance. Further, announcements of loans to such firms have higher than average positive stock market reaction. Both results are supportive of the signaling view of covenant design.

To show why interest-decreasing performance pricing is generally a tighter covenant than its interest-increasing counterpart, it is necessary to explain the mechanism of performance

pricing grids.¹ Consider a hypothetical example of a company that is borrowing at LIBOR plus 100 basis points and currently has a Debt / EBITDA ratio of 3.0. Using an interest-increasing, accounting-based PPC, the company would agree to increase its spread to 125 basis point should Debt / EBITDA rise to 3.5 and to 150 basis points for a ratio of 4.0. Beyond Debt / EBITDA of 4.5, the loan becomes due on demand. This is an example of a relaxed covenant as it gives the company slack should its debt ratio deteriorate. In contrast, the company could instead design an interest-decreasing PPC: borrowing at LIBOR as before, it would now agree that the loan becomes due on demand if its Debt / EBITDA ratio should rise to 3.5. Further interest-reducing provisions would state that the spread would narrow to 75 basis points if the ratio falls to 2.5 and to 50 basis points for a ratio of 2.0.

The tighter covenant package consisting of a lower same-variable covenant provision and an interest-decreasing PPC constitutes a signal that the firm expects its financial strength to improve. Such signals are quite common. In their empirical study, Asquith, Beatty and Weber (2005) report that interest-decreasing PPC is almost twice as prevalent as interest-increasing. As a positive signal, interest-decreasing PPC should be associated with lower spreads.

Third, we use matched pairs methodology and take advantage of a natural experiment to control for self-selection bias that likely arise because, as discussed above, firm risk characteristics influence the decision to introduce performance pricing in general and whether it be interest-increasing or –decreasing, accounting- or debt-rating-based. The natural experiment arises from the common practice of borrowers’ engaging in loans deals consisting of multiple loan contracts (facilities) on the same day with a common lead bank and set of participant lenders. Since some of the facilities in a deal contain a PPC and others do not, we can compare the impact of the PPC holding borrower and lender characteristics constant. In employing matching, we follow earlier papers in the literature that use matching techniques such as Helwege and Turner (1999), Bharath (2002), and Gottesman and Roberts (2004).

Taking advantage of a natural experiment through matching, offers a valuable alternative lens for viewing PPC along with the potential to sharpen the focus of their study. In particular, while Asquith *et al.* control for the self-selection that may be introduced by the propensity to establish either interest-increasing or interest decreasing performance pricing, such controls may be incomplete. Further, they do not recognize any differences between accounting- and debt-rating based features and their sample includes both. As a result, differences in risk unobservable to the econometrician may persist. Should such risk differences be correlated with the choice of covenant type, they may lead to biased results.

Our study employs the *Loan Pricing Corporation DealScan* database of loans initiated from 1994 to 1999. Our key results are as follows. First, our pooled sample tests estimate that the presence of a PPC of any type results in spreads that are 24.6 basis points lower than they would be without the PPC.. Yet we also find, similar to the previous literature, that there are important differences in borrower characteristics between loan facilities with and without PPCs. We therefore apply our matching technique and find that in its more refined control setting, the presence of any PPC is associated with a reduction in spread of 40.4 basis points. Of the 1,078 matched pairs in our sample, 941 include an accounting-based PPC. For this set of pairs, the average spread is 45.8 basis points lower with the PPC. But we also find that debt-rating-based PPCs result in spreads that are only approximately 3-4 basis points lower than they would be

¹ Our example draws on Asquith *et al.*(2005), Beatty, Dichev and Weber (2002) and Demiroglu and James (2007).

without the PPC, a difference that is only weakly statistically significant. Hence, we conclude that the rate spread benefits associated with PPCs are mainly limited to accounting-based-PPCs.

Our results also provide compelling evidence that estimating the effect of loan contract terms such as PPCs using pooled regressions can lead to estimating errors.

The rest of the paper is organized as follows. Section 2 discusses the data extraction and matching methodology. Sections 3 and 4 present the univariate and multivariate tests, respectively. Section 5 discusses the results and Section 6 concludes.

2. Data extraction and matching methodology

We form two samples to examine the relation between PPCs on loan spreads. The first is a nonmatched sample similar to Asquith et al. (2005). The second is a matched sample, the formation of which we will describe below. We extract loan data from *Loan Pricing Corporation's DealScan* (LPC) database which contains numerous loan deals, each between a syndicate of lenders, or a single lender, and a single borrower. Loan deals are typically composed of several individual loan facilities that can differ based on size, security, maturity, spreads, covenants, and other loan characteristics. The database reports 66,491 loan facilities. Of these, we eliminate all loan facilities for which the key measure of loan spreads, RATEAISD, is missing. RATEAISD is defined as the basis point coupon spread over LIBOR plus the annual fee and upfront fee, spread over the life of the loan. Further, we eliminate any observation prior to 1994; as Asquith *et al.* (2005) note, LPC reports comprehensive information about performance pricing in 1994. As a result of this filtering, 31,459 loan facilities remain, all with initiation dates during the time period 1994 through 1999, inclusive. We designate this sample the "pooled sample."

For each of these loan facilities, we extract a number of variables. We identify whether the loan facility is associated with an accounting-based PPC (ACCPPC) or debt-rating-based PPC (DEBTPPC). The measure of loan spread that we use is RATEAISD, defined earlier.

Control variables include borrower and loan characteristics. Borrower characteristics are BWMD, BONDRATE, TICKER, and BWSSIZE. BWMD is the Moody's senior debt rating, where the nonmissing ratings of Aaa through C are translated into an ordinal scale ranging from 28 to 8.² BONDRATE is an indicator variable that equals unity if the borrower has a bond rating and zero otherwise. TICKER is an indicator variable that is equal to unity if the borrower is publicly listed, as indicated through the availability of a ticker symbol on the LPC database. BWSSIZE is the borrower's sales size.

Loan characteristics are TFCMAT, AMTFCSIZ, REVOLVER, SYND, SECURED, and SECUREDMISS. TFCMAT is the months to maturity. AMTFCSIZ is the facility size. The remaining loan characteristics are indicator variables. REVOLVER equals unity if the loan is a revolving loan. SYND equals unity if the loan is syndicated. The securitization status is missing for a large proportion of observations; hence, we include both the SECURED and SECUREDMISS variables, where SECURED is equal to unity if the loan is designated as secured by the database and zero otherwise, while SECUREDMISS is equal to unity if the securitization status is missing. We also extract controls for financial covenants. FCOVENT1-12 are indicator variables that are equal to unity if there is are coverage covenants based on the fixed charge (FCOVENT1); debt service (FCOVENT2); interest (FCOVENT3); cash interest (FCOVENT4); leverage ratio (FCOVENT5); debt-to-cash flow (FCOVENT6); senior debt-to-

² All loan facilities in our sample are senior.

cash flow (FCOVENT7); debt-to-tangible net worth (FCOVENT8); debt-to-equity (FCOVENT9); current ratio (FCOVENT10); tangible net worth (FCOVENT11); and net worth (FCOVENT12).³

We next create a matched sample, through identifying pairs of facilities that are associated with a single loan deal, where one facility includes a PPC and the other does not. As stated above, forming such pairs allows us to control for lender, borrower, and temporal characteristics, as both elements of the pair are associated with the same lender(s), a single borrower, and a single date. If a single loan deal consists of more than two facilities, then a separate matched pair is identified for every combination of two facilities that differ on the basis of the existence of a PPC. Following this methodology, we identify a matched sample of 1,078 pairs consisting of 941 pairs that contain a loan facility element that is identified as ACCPPC, and 137 pairs that contain an element that is identified as DEBTPPC.

While the matched samples controls for all lender, borrower, and temporal characteristics, it does not control for loan characteristics, hence differences in such characteristics remain across the two elements of the matched sample. One difference is welcomed - by design, each pair consists of one facility with a PPC, and another without. Other differences in loan characteristics must be controlled, to ensure that differences between the two element groupings are due to the status of the PPC, and not other differences. We control for differences in loan characteristics through the inclusion of control variables in our multivariate tests.⁴

Descriptive statistics are presented in Table 1 for the full pooled and matched samples. The descriptive statistics indicate that of the pooled sample of 31,459 observations, 27.3% have a PPC. More specifically, 21.9% have an ACCPPC while only 5.3% have a DEBTPPC. The matched sample consists of 2,156 observations, or two for each of our 1,078 pairs. By construction, half of these observations have a PPC. Another notable finding is that only 21.2% of the pooled sample and 41.2% of the matched sample loan facilities have borrowers that are rated. Because of this, our multivariate tests will be performed separately for the rated and unrated facilities.

TABLE 1 HERE

Table 2 reports the number of loan facility observations that we identify for each year, and the proportion of these observations with or without PPCs, and the proportion that are ACCPPC and DEBTPPC. Depending on the year, as low as 18.66% (1994) and as high a 31.7% (1995) of our loan facilities have a PPC. There does not appear to be a temporal trend.

TABLE 2 HERE

3. Univariate analysis

3.1. Impact of any performance pricing covenant

³ The DealScan database reports many additional loan contract variables, such as whether the loan represents refinancing, loan option, amendments, and general covenants. However, because these variables are reported for only a small proportion of the sample, we do not include them in our tests.

⁴ While unreported, the results in this paper are also generally robust to refinements whereby the matched sample is limited to those pairs where both elements share identical loan characteristics, such as securitization status, syndication, financial covenants, loan options, and loan type.

We begin our measurement of the impact of introducing any PPC by using mean of difference tests for the pooled sample of loan facility observations. Next we refine these results for a subsample of matched pairs.

3.1.1. Pooled sample tests

For each variable, we calculate the difference of the mean variable value between those loan facilities without PPCs and those with, and compute the Student's T-statistic and Wilcoxon Signed Rank statistic to determine whether any identified differences are significant. The results of these tests are reported in Table 3. Our key result is that we find loan facilities without PPCs are associated with spreads that are 24.631 basis points higher than loan facilities with PPCs, significant at the 1% level of both the T and Wilcoxon statistics.

TABLE 3 HERE

We find significant differences between the two groups of loan facilities for almost all other variables besides the spread. These differences are all at the 1% level of the T and Wilcoxon statistics, with the exception of some financial covenants. We find that lower risk borrowers with higher bond ratings are more likely to avoid PPCs a finding supportive of the covenant signaling hypothesis. This result is clouded by the fact that loan facilities without PPCs are more likely to be associated with borrowers whose bond rating is missing; hence the full risk effect is uncertain. We find that loan facilities without PPCs are less likely to be associated with publicly traded firms, and are associated with smaller borrowers. We also find that loan facilities without PPCs are shorter and smaller than loan facilities with PPCs, and less likely to be revolvers or syndicated loans. These pooled sample results are generally consistent with Asquith, et al. (2005). They indicate that performance pricing tends to be included in loans with higher re-contracting, adverse selection, and moral hazard costs, such as syndicated loans, revolving loan facilities, loans used for takeover purpose, and loans with a longer maturity.

We find that loan facilities without PPCs are less likely to be secured. But as we found for rating, this result is clouded by the fact that loan facilities without PPCs are more likely to be associated with borrowers whose securitization status is missing; hence the full securitization effect is uncertain. Finally, we find that loan facilities without PPCs are generally less likely to include financial covenants. This is consistent with Beatty, et al (2002) who find evidence that the typical contract sets the initial pricing at the high-cost end of the performance pricing grid to handle credit improvements, while a same-variable covenant is set tightly beyond the top of the grid to handle credit deteriorations.

In brief, while the results in Table 3 strong evidence that loan facilities without PPCs have higher spreads than their counterparts with PPCs, we also find strong evidence that the two samples are widely disparate. To control for disparities related to borrower characteristics as well as for unobserved lender differences, we turn to matched pair tests.

3.1.2 Matched pairs tests

We now turn to a more precise measure the effect of any PPC by conducting difference of means tests using our matched sample to better control for non-spread differences between loan facilities without and with PPCs. The results of these tests for all PPC are reported in Table 4 (columns 1-3). By construction, there is no difference in all borrowers' characteristics (BWMD, BONDRATE, TICKER, and BWSSIZE) between the elements in any pair. Further, within each pair, the lead bank and participant lenders are identical so we also control for any unobserved variation in lender features.

TABLE 4 HERE

The key result of higher spreads for loan facilities without PPCs that we found for the pooled sample holds for the sample of all PPC matches. While our matched sample methodology controls for borrower characteristics, we continue to identify significant differences between the two groups of loan facilities for other variables besides the spread. For the sample of all matches, opposite to our finding for the pooled sample, we find that loan facilities without PPCs bear longer maturities than loan facilities with PPCs, significant at the 1% level for both the T and Wilcoxon statistics. Similar to our finding for the pooled sample, loan facilities without PPCs are smaller than loan facilities with PPCs, and are less likely to be revolvers, significant at the 1% level for both the T and Wilcoxon statistics. We do not find significant differences for syndication.

To summarize, the difference of means tests for the matched sample demonstrate that loan facilities without PPCs are associated with higher spreads even under the refined control setting associated with matched pairs. Finally, there continue to be significant loan characteristic differences between loan facilities with and without PPCs. In Section 4 we will perform multivariate tests to control for these differences.

3.2. Accounting-based vs. debt-rating based performance pricing covenants

Table 1 supports Doyle's (2003) characterization of firms with ACCPPC as riskier with higher average spreads and lower bond ratings than borrowers with DEBT PPC. Further, borrowers with ACCPPC are less likely to have a bond rating or to be listed on a stock exchange. These borrowers are also likely to be smaller and more likely to borrow on a secured basis. These differences are statistically significant for both the pooled and matched samples.

Based on the riskier profile of borrowers using ACCPPC, we hypothesized that PPC will reduce spreads by a greater amount than for borrowers with DEBT PPC. In Table 4, we find support for this hypothesis: for ACCPPC matches, we find that loan facilities without PPCs are associated with spreads that are 45.762 basis points higher than loan facilities with PPCs, significant at the 1% level of the T and Wilcoxon statistics. But for DEBT PPC matches, loan facilities without PPCs are associated with spreads that are only 3.728 basis points higher than loan facilities without PPCs. Further, this result is only significant for the T-statistic, and at the 5% level. While these results support our hypothesis, it remains for multivariate tests to control for differences within pairs on loan characteristics also documented in Table 4.

3.3 Interest-increasing vs. interest-decreasing performance pricing covenants

Tearsheets describing the pricing grids are required to identify interest-increasing (INTINCR) and interest-decreasing (INTDECR) features in PPCs. These are available for a subset of loan facilities for which summary statistics appear in Table 4, sorted by ACCPPC (panel B) and DEBT PPC (panel C). Interest-decreasing PPC is more far more common and the imbalance is due to the far larger ACCPCC subset: there are a total of 429 cases of INTINCR and 787 observations of INTDECR in the pooled sample and 24 INTINCR and 230 INTDECR for the matched pairs. In contrast, for DEBT PPC, the two types are fairly evenly matched with 134 INTINCR and 140 INDECR in the pooled sample and 8 INTINCR and 12 INTDECR in the paired sample. This imbalance is similar to that reported in Asquith *et al.*(2005).

We show earlier that ACCPPC borrowers are riskier. Taken with their preponderant use of INTDECR over INTINCR PPC, this suggests that INCTDECR borrowers are riskier. Table 1 verifies this idea: in the ACCPPC subsample in panel B, we see that borrowers with INTDECR

have higher spreads, lower bond ratings and are more likely to use security – all consistent with higher risk.

Further, the descriptive statistics support our idea that, of the two types of PPC, INTDECR represents a tighter constraint especially for the ACCPPC subset. For more relaxed INTINC PPC, most cases (89% for the pooled sample and 88% for the matched sample) also include an INTDECR provision indicating that the accounting variable can move in either direction before reaching the end of the grid and a constraining covenant. In contrast, for INTDECR, far fewer cases also include an INTINCR provision (48% for the pooled sample and only 9% for the matched sample). This means that most INTDECR PPCs lack an interest-increasing provision and are set at the edge of the grid tightly bounded by a same-variable covenant.

As a tight covenant, we predict that INDECR PPC are expected to reduce spreads according to the covenant signaling hypothesis. The matched pair tests in Table 4, Panel B support our prediction: INTRCR PPC is associated with a lower spread of 50.4 basis points. **The samples in Table 4, Panel B include both ACCPPC and DEBTPPC. The 32 INTR pairs include 24 ACCPPC and 8 DEBTPPC. For INTDECR, the numbers are 230 and 12, respectively.** The predominance of ACCPPC suggests that the spread-decreasing role of INTDECR PPC derives from the features of borrowers selecting ACCPPC as discussed above. Table 4, panel B also shows that the signaling effect exceeds the magnitude of the credit adjustment option which imparts a positive value to INTINCR PPC. While this reinforces the importance of covenant signaling, we must interpret the comparison of magnitudes with caution because the INTDECR subsample contains a larger weighting of ACCPPC for which the effect should be stronger.

Overall, this section of our matched pairs tests reinforces the results in Asquith *et al.* (2005) assigning a spread-reducing role to INTINCR PPC. This type of PPC provides a valuable option to lenders for which borrowers are compensated. For INTDECR PPC, however, our results are opposite to those of Asquith *et al.* who report a small positive impact of INTDECR on spreads which they attribute to charging borrowers for lower renegotiation costs. In contrast, we find a negative influence strongly significant both statistically and economically and consistent with the covenant signaling hypothesis. In particular, by separating ACCPPC and DEBTPPC in our tests, we show that the higher risk profile of borrowers using ACCPPC reinforces the covenant signaling effect. While this separation of different PPC types in pricing tests constitutes a unique contribution of the present paper, it cannot explain why we obtain results opposite to those of Asquith *et al.* because their sample also includes predominantly ACCPPC. Rather, the difference must lie in the effectiveness of risk controls.

Such controls are necessary due to the higher risk profiles of borrowers with INTDECR documented above. To control for selection bias that could arise due to different risk levels, Asquith *et al.* employ probit regressions predicting the propensity to use INTINCR and INTDECR PPC. In this paper, we control for risk differences through matched pairing. Our approach improves on Asquith *et al.* by allowing for perfect controls of borrower risk as well as of unobserved lender risk. This suggests that the positive coefficient on INTDECR (increasing spread) in their study may be due to unobservable risk imperfectly controlled. An alternative explanation is that our finding that INTDECR PPC is associated with lower spreads is biased due to imperfect controls for differences in loan features such as maturity and security. To distinguish between these explanations requires multivariate testing.

4. Multivariate tests

The results of the univariate tests performed in Section 3 demonstrate that through using matched pair methodology, we are able to create two groups that are highly similar. The difference of means tests we then performed provide strong evidence that loan facilities without ACCPPCs have spreads that are approximately 45.762 basis points higher than loan facilities with ACCPPCs, while the difference between loan facilities without and with DEBTTPCs is only 3.728 basis points. Counting tests confirm that loan spreads are typically higher for the loan facility with ACCPPC matched pairs, and typically identical for DEBTTPC matched pairs.

Yet the univariate tests also demonstrate that some differences remain between the elements without and with PPC that may influence the difference in spreads due to factors unrelated to the presence or absence of PPCs. We therefore investigate this issue further through performing regressions relating loan spreads and the presence of either ACCPPCs or DEBTTPCs, while controlling for other loan contract characteristics. Table 6 presents the correlations between the variables used in the regression tests.

TABLE 6 HERE

To test the core spread-PPC relation, all of the regression tests use spreads as the dependent variable, and include indicator variables for the presence of the PPCs as independent variables, as well as other independent variables that are included as controls. We estimate the regression model using three methods, with each method imposing different restrictions. The first method tests the relation between the dependent variable and all variables. The second method removes the control for loan facility maturity, TFCMAT. The third method replaces TFCMAT and removes the controls for securitization, SECURED and SECUREDMISS. The justification for excluding maturity and security from some regressions is that they are jointly determined along with the spread and the inclusion and type of performance pricing. We therefore exclude these variables from some regressions that we test to ensure that our results are robust to the endogeneity issue.

We perform the regressions separately for the pooled, ACCPPC, and DEBTTPC matched pair samples. We further refine the regressions through testing the model for two groupings of facilities; those for which debt rating is provided (Table 7), and those loan facilities that are unrated (Table 8). Hence the regressions in Table 7 exclude the BONDRATE variable, as all loan facility observations tested in this table are rated. Similarly, the regressions in Table 8 exclude both the BWMD and BONDRATE variables, as all observations tested in this table are unrated.

TABLE 7 HERE

TABLE 8 HERE

4.1. Regression tests, pooled sample

The results for the pooled sample are reported in columns 1-3 of Tables 7 (rated) and 8 (unrated). For both groupings, there is strong evidence that both ACCPPC and DEBTTPC covenants reduce spreads. The results are similar when all controls are used and when TFCMAT is excluded, columns (1) and (2), respectively. For the rated grouping (Table 7), the coefficient associated with ACCPPC is -24.81 and -22.78 when all controls are used and when TFCMAT is excluded, respectively, while the coefficient associated with DEBTTPC is -27.91 and -28.94 when all controls are used and when TFCMAT is excluded. These results are significant at the 1% level. For the unrated grouping (Table 8), the coefficient associated with ACCPPC is -29.09 and -30.41 when all controls are used and when TFCMAT is excluded, respectively, while the

coefficient associated with DEBTPPC is -32.13 and -32.67 when all controls are used and when TFCMAT is excluded. These results are significant at the 1% level. When SECURED and SECUREDMISS are excluded, column (3), spreads remain lower in the presence of both ACCPPC and DEBTPPC, though smaller in magnitude for ACCPPC and larger in magnitude for DEBTPPC. For the rated grouping (Table 7), the coefficient values are -7.27 and -32.09 for ACCPPC and DEBTPPC, respectively, significant at the 1% level. For the unrated grouping (Table 8), the coefficient values are -12.82 and -45.48 for ACCPPC and DEBTPPC, respectively, significant at the 1% level.

4.2. Regression tests, ACCPPC and DEBTPPC matched samples

The above results suggest that both ACCPPC and DEBTPPC are associated with lower spreads than loan facilities without PPCs. Yet as we demonstrated in Section 3, there are many important differences between the with and without PPC samples; hence even in a multivariate setting these results may be attributable to differences unrelated to the presence or absence of PPCs. If these results are attributable to the presence of PPCs, then they should continue to hold in the more refined control setting that we created using our matching methodology. This subsection repeats the regression tests for the ACCPPC matched sample, while the subsequent section will repeat the regression tests for the DEBTPPC matched sample.

The results for the ACCPPC matched sample are presented in columns 4-6 of Tables 7 (rated) and 8 (unrated). The results provide strong evidence that ACCPPC results in lower spreads. For the rated grouping (Table 7), the coefficient associated with ACCPPC is -30.53 and -36.51 when all controls are used (column 4) and when TFCMAT is excluded (column 5), respectively, while the coefficient associated with ACCPPC for the unrated grouping (Table 8) is -35.28 and -41.82 when all controls are used and when TFCMAT is excluded. These results are significant at the 1% level. When SECURED and SECUREDMISS are excluded, column (6), the coefficient values associated with ACCPPC are -28.91 and -27.14 for the rated and unrated groupings, respectively, significant at the 1% level.

The results for the DEBTPPC matched sample are presented in columns 7-9 of Tables 7 (rated) and 8 (unrated). The results provide strong evidence that DEBTPPC does not result in lower spreads, similar to our finding for the univariate tests. There are no significant coefficients associated with and DEBTPPC variable. This result provides strong support for our contention that the matched sample represents a refinement of the pooled sample tests, and clearly indicates that the spread advantage associated with PPCs is limited to ACCPPs.

4.3 Control variables

As expected, we find that spreads are lower for higher rated, publicly traded, and larger borrowers, though the coefficients associated with the variable that measures public trading, TICKER, is generally insignificant for the ACCPPC matched sample, for both rated and unrated groupings, and is generally insignificant for the DEBTPPC matched sample, for the unrated grouping. We also generally find a positive relation between spreads and facility maturity for the rated grouping, and find some weak evidence of a negative relation for the unrated grouping. For the pooled sample and ACCPPC matched sample, we find strong evidence of lower spreads associated with revolvers, and find weak evidence of a positive relation between spreads and syndication for the DEBTPPC matched sample for the rated grouping (all unrated DEBTPPC facilities are syndicated). We find strong evidence of higher spreads associated with securitization, reflecting the earlier literature, and also find broad evidence of lower spreads for

facilities for which securitization status is missing. Finally, spreads are generally unrelated to financial covenants, with some exceptions.

5. Robustness tests

5.1. Counting tests, matched sample

We next count the number of times that the loan facility without PPCs of the matched pairs is associated with higher, identical, or lower spreads, relative to the loan facility with the PPC. We report the results of these counting tests in panels A (all matched pairs), B (ACCPPC) and C (DEBTPPC) of Table 5. These values are reported separately for matched pairs associated with borrower with Moody' senior debt ratings of A, B, C, and unrated. We also report the percentage higher, identical, lower, and the number of pairs for each sample.

TABLE 5 HERE

For the all PPC and ACCPPC matched pair samples, we find further strong evidence that loan facilities without PPCs are associated with higher spreads than the those with PPCs. Overall, for 71% of all matched pairs and 79% of ACCPPC matched pairs, the loan facility without the PPC is associated with higher spreads than the loan facility with the PPC, while the reverse is true for only 10% and 9% of the matched pairs, respectively. We find similar results for the A, B,C, and unrated borrower cases, with the exception of the A-rated case for the all PPC matched pair sample. In this case, we find a very large proportion where spreads are identical for both elements in the pair. This indicates that performance pricing is not as beneficial to high quality borrowers.

The results for the DEBTPPC matched pair sample are more ambiguous, and correspond to our findings for the difference of means tests. Overall, 12% of matched pairs exhibit higher spreads for the loan facility without the PPC over the loan facility with the PPC, while the reverse is true in 18% of the matched pairs. More interestingly, spreads are identical in 70% of the matched pairs. These results are generally consistent for borrowers rated A, B, and unrated. There are no observations in this sample where the borrower is rated C.

6. Discussion of Results

In the pooled sample, our results support the hypothesis that performance pricing is used to signal borrowers' quality. Performance pricing tends to be included in loans to publicly listed borrowers with low debt ratings, but with high potential growth as reflected by large sales. Furthermore, in the pooled sample, performance pricing tends to feature in revolving loans, unsecured loans, and syndicated loans with longer maturities, larger facility sizes, and financial covenants. Additionally, the results in the pooled sample indicate that including performance pricing can reduce loan spreads by approximately 25-30 basis points.

After controlling for borrower and lender characteristics, accounting-based PPC results in spreads that are approximately 45 basis points lower than they would be without the PPC in univariate tests, and ranges from 30-35 in subsequent multivariate tests. Most interestingly, we also find that debt-rating-based PPC result in spreads that are only approximately 3-4 basis points lower than they would be without the PPC, a difference that is only weakly statistically significant, and which is positive and insignificant in subsequent multivariate tests of the debt-rating-based PPC matched pair sample. Using an OLS model corrected for potential self-selection problems and controlled for some loan characteristics, Asquith, et al. (2002) find that spread charged on a loan is 67 to 90 basis points lower when performance pricing is used. While their model controls only some loan characteristics, but does not control for borrower credit risk, our study control not only more loan characteristics, but also borrower characteristics. Thus, we

believe that our method can reduce more bias and give more a correct treatment effects of performance pricing.

Since performance pricing allows loan spreads not only to increase when a borrower's performance deteriorates, but also to decrease when a borrower's performance improves, the benefit to lenders and borrowers is ambiguous *a priori*, and its effect on borrowing costs is also uncertain. Our paper provides empirical evidence that including performance pricing can reduce borrowing costs. This is true in both non-matched and matched step samples.

In the pooled sample, performance pricing can reduce borrower costs. This can reasonably be explained based on asymmetric information, adverse selection, moral hazard, and re-contracting costs. Some borrowers might believe that the quality of their company is better than the market perceives or is better than the current company's debt rating, thus, the company's borrowing costs should be lower. However, under asymmetric information between a borrower and lenders, a borrower might not be able to convincingly send this message to lenders. Accordingly, performance pricing is used as a tool to credibly signal the company's quality. Moreover, our results report that in the pooled sample, loans with performance pricing tend to be syndicated loans. Performance pricing in a syndicated loan contract will not only signal the borrower's quality to the lead bank, but also mitigate syndicated members' fear of being exploited by the lead bank (Panyagometh and Roberts (2003)). Finally, performance pricing can reduce adverse selection, moral hazard and re-contracting costs. These also might be a reason why lenders are willing to charge less if performance pricing is included in a loan agreement (Asquith, et al. (2002) and Beatty, et al. (2002)).

Beyond borrowing costs, our results highlight a new empirical regularity: when borrowers issue two loan facilities at the same time, they often include performance pricing in one loan facility, but not in the other. Within such pairs, loans with performance pricing tend to have shorter maturity and performance pricing can reduce borrowing costs significantly. Gottesman and Roberts (2004) examine a set of pairs of loan facilities -- one with shorter maturity and other with longer maturity -- issued by the same borrower at the same issue date. They find that the longer maturity loan facilities exceed the maturity of the shorter facilities by 26 months, on average.

While a decision whether to issue secured or unsecured loans might depend on the availability of borrowers' assets suitable as collateral and whether to issue shorter or longer term loans might depend on the term of the projects financed, no such natural explanation applies to performance pricing. Why, then would borrowers not include performance pricing in all of their loan contracts to reduce their borrowing costs?

According to our results, performance pricing tends most often to be a feature of loans with shorter maturities. This is consistent with the notion that borrowers have limited ability to predict their performance far into the future. Thus, for longer-maturity loans, borrowers might be unwilling to reduce their initial borrowing costs by including performance pricing fearing that, if their performance deteriorated in the future, loan spreads would increase resulting in higher *ex post* borrowing costs. For loans with shorter maturities, borrowers are likely able to predict their companies' performance with more confidence and if they think that their companies' performance will get better, or at least not get worse, they will be willing to include performance pricing in their loan contracts and obtain lower loan spreads.

Why is the spread effect large for accounting-based PPCs and very small for debt-rating-based PPCs? Our results support the idea that accounting ratios are more sensitive and better

reflect changes in borrowers' credit risk than debt ratings, supporting Doyle (2003). But it is also noteworthy that after controlling for differences in borrower characteristics, an important difference between loans with accounting-based and debt-rating-based performance pricing is term-to-maturity. In particular, when compared against loans without this feature, loans with accounting-based performance pricing are approximately 10 months *shorter* in maturity, while loans with debt-rating-based performance pricing are approximately 31 months *longer* in maturity. This suggests that the low spreads associated with out debt-rating-based PPC matched pair sample may be due to relative maturity. While our multivariate tests control for maturity, future research may explore this effect further.

Another reason why accounting-based performance pricing has a larger effect on loan spreads could be due to timeliness. While accounting ratios are updated quarterly, debt ratings are revised at most every six months except when a firm experiences a crisis. Accordingly, accounting ratios are more sensitive and better reflect changes in borrowers' credit risk than debt ratings, hence accounting-based performance pricing adds more value than debt-rating-based performance pricing.

7. Conclusion

PPCs are predicted to reduce loan spreads as they serve to control costs associated with asymmetric information, adverse selection, moral hazard and recontracting costs (Asquith et al. (2002)). This paper tests and supports this view using a carefully matched sample of loan facilities initiated between 1970 and 1999 and documented in the *Loan Pricing Corporation DealScan* database. Our main result is that the type of performance pricing matters: compared against controls, loans with accounting-based performance pricing enjoy significantly lower spreads while we detect only small and weakly significant differences in loans which base performance pricing on debt ratings. This finding is consistent with Doyle (2003) who suggests that accounting ratios are better reflectors of changes in credit quality.

Finally, our matching methodology uncovers an interesting empirical regularity. Firms often take out several loan facilities from the same lenders on the same day and typically include a performance pricing feature in the shorter-maturity loan only. This finding contrasts with Asquith et al. (2002) who report that the probability of employing performance-pricing increases with maturity. A possible explanation to be tested in future research is that firms balance the signaling benefits of performance pricing against danger of facing higher costs in future if the signal is false. Since uncertainty in forecasts increases with the time horizon, there is a point beyond which performance pricing is seen as too risky.

References

- Asarnow, E. 1995. Measuring the Hidden Risks in Corporate Loans. *Commercial Lending Review* 10. 24-32.
- Asquith, P., A. Beatty, J. Weber. 2002. Performance pricing in Debt Contracts. Working Paper. Penn State University and MIT.
- Beatty, A., I.D. Dichev, J. Weber. 2002. The Role and Characteristics of Accounting-Based Performance pricing in Private Debt Contracts. Working Paper. Penn State University, University of Michigan, and MIT. June.
- Bharath, Sreedhar T. 2002. Agency costs, bank specialness and renegotiation, Working Paper, New York University.
- Doyle, J.T. 2003. Credit Risk Measurement and Pricing in Performance pricing-Based Debt Contracts. Working Paper. University of Michigan.
- Gottesman. A.A., and G.S. Roberts. 2004. Maturity and Corporate Loan Pricing. *Financial Review* (February).
- Helwege, Jean and Christopher M. Turner. 1999. The slope of the credit yield curve for speculative-grade issuers, *Journal of Finance* 54 (October), 1869-1884.
- Loomis, F.A. 1991. Performance-Based Loan Pricing Techniques. *Journal of Commercial Bank Lending* 74. 2. 7-11.
- Panyagometh, K., and G.S. Roberts. 2010. Do lead banks exploit syndicate participants? Evidence from Ex Post risk. *Finance Management* (Spring), 273-299

Table 1: Descriptive statistics for each variable. The number of observations, mean value and standard deviation for each variable are reported for both the full and matched paired samples. Variable definitions are as follows: All PPC is an indicator variable that is equal to unity if the loan facility has a performance pricing covenant (PPC). ACCPPC and DEBTPPC are indicator variables that are equal to unity if the loan facility has an accounting-based PPC or debt-rating-based PPC, respectively. RATEAISD is the basis point coupon spread over LIBOR plus the annual fee and upfront fee, spread over the life of the loan. BWMD is the Moody's senior debt rating, where the nonmissing ratings of Aaa through C are translated into an ordinal scale ranging from 28 to 8. BONDRATE is an indicator variable that equals unity if the borrower has a bond rating. TICKER is an indicator variable that is equal to unity if the borrower has a ticker symbol. BWSSIZE is the borrower's sales size. TFCMAT is the months to maturity. AMTFCSIZ is the facility size. REVOLVER and SYND are indicator variables that equal unity if the loan is a revolving loan or syndicated, respectively. SECURED and SECUREDMISS are indicator variables that equal to unity if the loan is designated as secured by the database or if the securitization status is missing, respectively. FCOVENT1-12 are indicator variables that are equal to unity if there is are coverage covenants based on the fixed charge (FCOVENT1); debt service (FCOVENT2); interest (FCOVENT3); cash interest (FCOVENT4); leverage ratio (FCOVENT5); debt-to-cash flow (FCOVENT6); senior debt-to-cash flow (FCOVENT7); debt-to-tangible net worth (FCOVENT8); debt-to-equity (FCOVENT9); current ratio (FCOVENT10); tangible net worth (FCOVENT11); and net worth (FCOVENT12).

	Pooled sample			Matched Sample		
	Number	Mean	Std.	Number	Mean	Std.
All PPC	31,459	0.273	0.445	2,156	0.500	0.500
ACCPPC	31,459	0.219	0.414	2,156	0.436	0.496
DEBTPPC	31,459	0.053	0.225	2,156	0.064	0.244
RATEAISD	31,459	183.784	125.064	2,156	240.292	109.009
BWMD	6,679	18.117	3.754	888	16.527	3.401
BONDRATE	31,459	0.212	0.409	2,156	0.412	0.492
TICKER	31,459	0.388	0.487	2,156	0.485	0.500
log(BWSSIZE)	20,737	19.676	1.877	1,850	20.115	1.681
TFCMAT	26,725	51.348	107.658	2,119	68.840	31.419
log(AMTFCSIZ)	31,459	17.969	1.623	2,156	18.302	1.358
REVOLVER	31,459	0.576	0.494	2,156	0.334	0.472
SYND	31,407	0.876	0.330	2,156	0.967	0.180
SECURED	31,459	0.392	0.488	2,156	0.753	0.431
SECUREDMISS	31,459	0.511	0.500	2,156	0.175	0.380
FCOVENT1	31,459	0.046	0.209	2,156	0.051	0.221
FCOVENT2	31,459	0.025	0.158	2,156	0.030	0.170
FCOVENT3	31,459	0.049	0.217	2,156	0.052	0.222
FCOVENT4	31,459	0.002	0.049	2,156	0.002	0.043
FCOVENT5	31,459	0.023	0.150	2,156	0.026	0.160
FCOVENT6	31,459	0.053	0.224	2,156	0.055	0.228
FCOVENT7	31,459	0.010	0.101	2,156	0.012	0.109
FCOVENT8	31,459	0.031	0.174	2,156	0.035	0.183
FCOVENT9	31,459	0.002	0.045	2,156	0.007	0.083
FCOVENT10	31,459	0.023	0.151	2,156	0.025	0.156
FCOVENT11	31,459	0.043	0.204	2,156	0.045	0.206
FCOVENT12	31,459	0.034	0.181	2,156	0.045	0.206

Table 2. Percentage of loan facilities with performance pricing covenants. The number of loan facility observations, the percentage without performance pricing covenants (No PPC), with PPC (All PPC), with accounting-based PPC (ACPPC) and with debt-rating-based PPC (DEBTPPC) are reported for the entire sample, and separately for every year within our sample period.

Year	Number of loan facility observations	No PPC	All PPC	ACPPC	DEBTPPC
Total	31,459	72.75%	27.25%	21.91%	5.34%
1994	3,575	81.34%	18.66%	13.31%	5.34%
1995	3,666	68.30%	31.70%	24.17%	7.53%
1996	5,135	69.56%	30.44%	23.82%	6.62%
1997	6,826	72.24%	27.76%	22.33%	5.44%
1998	6,308	68.53%	31.47%	26.97%	4.50%
1999	5,949	78.13%	21.87%	18.22%	3.65%

Table 3. Difference of means tests, pooled sample. We present the difference of the mean variable value between those loan facilities without PPCs and those with, and calculate the Student's T-statistic and Wilcoxon Signed Rank statistic. Variable definitions are as follows: RATEAISD is the basis point coupon spread over LIBOR plus the annual fee and upfront fee, spread over the life of the loan. BWMD is the Moody's senior debt rating, where the nonmissing ratings of Aaa through C are translated into an ordinal scale ranging from 28 to 8. BONDRATE is an indicator variable that equals unity if the borrower has a bond rating. TICKER is an indicator variable that is equal to unity if the borrower has a ticker symbol. BWSSIZE is the borrower's sales size. TFCMAT is the months to maturity. AMTFCsiz is the facility size. REVOLVER and SYND are indicator variables that equal unity if the loan is a revolving loan or syndicated, respectively. SECURED and SECUREDMISS are indicator variables that equal to unity if the loan is designated as secured by the database or if the securitization status is missing, respectively. FCOVENT1-12 are indicator variables that are equal to unity if there is are coverage covenants based on the fixed charge (FCOVENT1); debt service (FCOVENT2); interest (FCOVENT3); cash interest (FCOVENT4); leverage ratio (FCOVENT5); debt-to-cash flow (FCOVENT6); senior debt-to-cash flow (FCOVENT7); debt-to-tangible net worth (FCOVENT8); debt-to-equity (FCOVENT9); current ratio (FCOVENT10); tangible net worth (FCOVENT11); and net worth (FCOVENT12).

	Without PPC	With PPC	Mean difference	T-stat	Wilcoxon Statistic
RATEAISD	22,886	8,573	24.631	17.899***	126515437.5***
BWMD	3,771	2,908	0.755	8.419***	9163705.5***
BONDRATE	22,886	8,573	-0.174	-30.758***	-151965142.5***
TICKER	22,886	8,573	-0.278	-45.289***	-162097822***
log(BWSSIZE)	13,146	7,591	-0.359	-14.15***	-84627600.5***
TFCMAT	18,277	8,448	-5.387	-5.42***	-124943780***
log(AMTFCsiz)	22,886	8,573	-0.558	-28.982***	-153433955.5***
REVOLVER	22,886	8,573	-0.110	-18.07***	-145660310.5***
SYND	22,834	8,573	-0.082	-23.297***	-142702285***
SECURED	22,886	8,573	-0.280	-45.645***	-162289853***
SECUREDMISS	22,886	8,573	0.425	78.997***	93124092***
FCOVENT1	22,886	8,573	-0.009	-3.305***	-135749015.5***
FCOVENT2	22,886	8,573	-0.006	-3.081***	-135489457.5***
FCOVENT3	22,886	8,573	-0.008	-2.838***	-135643565.5***
FCOVENT4	22,886	8,573	-0.001	-1.636	-134963655.5*
FCOVENT5	22,886	8,573	-0.005	-2.323**	-135304731**
FCOVENT6	22,886	8,573	-0.011	-3.873***	-135978541.5***
FCOVENT7	22,886	8,573	-0.001	-0.702	-134943037
FCOVENT8	22,886	8,573	-0.005	-1.985**	-135295592.5**
FCOVENT9	22,886	8,573	-0.001	-2.105**	-134987921**
FCOVENT10	22,886	8,573	-0.004	-1.896*	-135221834**
FCOVENT11	22,886	8,573	-0.006	-2.16**	-135415567**
FCOVENT12	22,886	8,573	-0.006	-2.528**	-135443157***

***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 level.

Table 4. Difference of means tests, matched sample. For the matched pair sample where one element is an accounting-based performance pricing covenants (ACCPPC), and separately for the corresponding debt-rating-based performance pricing covenants (DEBTPPC) case, we present the difference of the mean variable value between those loan facilities without PPCs and those with. We calculate the Student's T-statistic and Wilcoxon Signed Rank statistic. Variable definitions are as follows: RATEAISD is the basis point coupon spread over LIBOR plus the annual fee and upfront fee, spread over the life of the loan. BWMD is the Moody's senior debt rating, where the nonmissing ratings of Aaa through C are translated into an ordinal scale ranging from 28 to 8. BONDRATE is an indicator variable that equals unity if the borrower has a bond rating. TICKER is an indicator variable that is equal to unity if the borrower has a ticker symbol. BWSSIZE is the borrower's sales size. TFCMAT is the months to maturity. AMTFCsiz is the facility size. REVOLVER and SYND are indicator variables that equal unity if the loan is a revolving loan or syndicated, respectively. SECURED and SECUREDMISS are indicator variables that equal to unity if the loan is designated as secured by the database or if the securitization status is missing, respectively. FCOVENT1-12 are indicator variables that are equal to unity if there are coverage covenants based on the fixed charge (FCOVENT1); debt service (FCOVENT2); interest (FCOVENT3); cash interest (FCOVENT4); leverage ratio (FCOVENT5); debt-to-cash flow (FCOVENT6); senior debt-to-cash flow (FCOVENT7); debt-to-tangible net worth (FCOVENT8); debt-to-equity (FCOVENT9); current ratio (FCOVENT10); tangible net worth (FCOVENT11); and net worth (FCOVENT12).

	All PPC (pairs = 1,078)			ACCPPC (pairs = 941)			DEBTPPC (pairs = 137)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Mean difference	T-stat	Wilcoxon Statistic	Mean difference	T-stat	Wilcoxon Statistic	Mean difference	T-stat	Wilcoxon Statistic
RATEAISD	40.420	19.734***	149069***	45.762	20.077***	135590***	3.728	2.014**	56
BWMD	0	N/A	N/A	0	N/A	N/A	0	N/A	N/A
BONDRATE	0	N/A	N/A	0	N/A	N/A	0	N/A	N/A
TICKER	0	N/A	N/A	0	N/A	N/A	0	N/A	N/A
log(BWSSIZE)	0	N/A	N/A	0	N/A	N/A	0	N/A	N/A
TFCMAT	4.898	4.974***	70975***	10.332	11.379***	100177.5***	-31.581	-10.334***	-2989***
log(AMTFCsiz)	-0.214	-7.472***	-63895***	-0.196	-6.325***	-43669***	-0.338	-4.582***	-1540***
REVOLVER	-0.480	-27.66***	-77291.5***	-0.442	-23.843***	-50856***	-0.737	-17.123***	-2777.5***
SYND	-0.002	-0.577	-6.5	-0.004	-1.265	-11	0.014	1.419	1.5
SECURED	-0.017	-3.195***	-148.5***	-0.021	-3.676***	-155***	0.014	1.419	1.5
SECUREDMISS	0.026	4.356***	301***	0.023	4.049***	170.5***	0.043	1.745*	19.5
FCOVENT1	-0.006	-0.734	-161	-0.002	-0.229	-38.5	-0.036	-1.294	-20
FCOVENT2	0	N/A	N/A	-0.003	-0.412	-40.5	0.022	1	7.5
FCOVENT3	-0.002	-0.204	-48.5	-0.002	-0.221	-41.5	0	N/A	N/A
FCOVENT4	-0.004	-2.003**	-5	-0.002	-1.415	-1.5	-0.014	-1.419	-1.5
FCOVENT5	-0.012	-1.787*	-175.5*	-0.010	-1.313	-108	-0.029	-1.643	-7
FCOVENT6	-0.019	-2.052**	-556.5**	-0.015	-1.511	-304.5	-0.050	-1.615	-35
FCOVENT7	0.004	0.784	27	0.004	0.816	25	0	N/A	N/A
FCOVENT8	0.008	1.116	148.5	0.003	0.404	42	0.043	1.915*	16.5
FCOVENT9	-0.003	-0.774	-12	-0.002	-0.534	-7.5	-0.007	-1	-0.5
FCOVENT10	-0.004	-0.566	-51	-0.004	-0.59	-47	0	0	0
FCOVENT11	0.015	1.791*	324*	0.012	1.344	187	0.036	1.391	17.5
FCOVENT12	-0.006	-0.639	-133.5	-0.006	-0.654	-127.5	0	N/A	N/A

***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 level.

Table 5. Counting tests, matched sample. The number of times that the facility without a performance pricing covenant (PPC) of a matched pair has a higher, identical, or lower value for the rates all in spread (RATEAISD) variable relative to the facility with a PPC is reported. These values are reported for all matched pairs (Panel A), matched pairs where the facility with a PPC is an accounting-based PPC (ACPPC), and matched pairs where the facility with a PPC is a debt-rating-based PPC (DEBTPPC). These results are reported for all rating categories, and are reported separately for matched pairs associated with borrower with Moody' senior debt ratings of A, B, C, and unrated. We also report the percentage higher, identical, lower, and the number of paired observations for each sample.

Panel A: All performance pricing covenants matched sample

	All		A-Rated		B-Rated		C-Rated		Unrated	
	Pairs	%	Pairs	%	Pairs	%	Pairs	%	Pairs	%
$\Delta\text{RATEAISD} > 0$	760	71%	7	13%	293	79%	10	67%	450	71%
$\Delta\text{RATEAISD} = 0$	210	19%	46	82%	51	14%	1	7%	112	18%
$\Delta\text{RATEAISD} < 0$	108	10%	3	5%	29	8%	4	27%	72	11%
Total	1078	100%	56	100%	373	100%	15	100%	634	100%

Panel B: Accounting-based performance pricing covenants matched sample

	All		A-Rated		B-Rated		C-Rated		Unrated	
	Pairs	%	Pairs	%	Pairs	%	Pairs	%	Pairs	%
$\Delta\text{RATEAISD} > 0$	744	79%	6	67%	285	89%	10	67%	443	74%
$\Delta\text{RATEAISD} = 0$	114	12%	2	22%	21	7%	1	7%	90	15%
$\Delta\text{RATEAISD} < 0$	83	9%	1	11%	14	4%	4	27%	64	11%
Total	941	100%	9	100%	320	100%	15	100%	597	100%

Panel C: Debt-rating-based performance pricing covenants matched sample

	All		A-Rated		B-Rated		C-Rated		Unrated	
	Pairs	%	Pairs	%	Pairs	%	Pairs	%	Pairs	%
$\Delta\text{RATEAISD} > 0$	16	12%	1	2%	8	15%	0	N/A	7	19%
$\Delta\text{RATEAISD} = 0$	96	70%	44	94%	30	57%	0	N/A	22	59%
$\Delta\text{RATEAISD} < 0$	25	18%	2	4%	15	28%	0	N/A	8	22%
Total	137	100%	47	100%	53	100%	0	N/A	37	100%

Table 6. Correlations between variables for the pooled sample are presented. Variable definitions are as follows: ACCPPC and DEBTTPC are indicator variables that are equal to unity if the loan facility has an accounting-based performing pricing covenant (PPC) or debt-rating-based PPC, respectively. RATEAISD is the basis point coupon spread over LIBOR plus the annual fee and upfront fee, spread over the life of the loan. BWMD is the Moody's senior debt rating, where the nonmissing ratings of Aaa through C are translated into an ordinal scale ranging from 28 to 8. BONDRATE is an indicator variable that equals unity if the borrower has a bond rating. TICKER is an indicator variable that is equal to unity if the borrower has a ticker symbol. BWSSIZE is the borrower's sales size. TFCMAT is the months to maturity. AMTFCsiz is the facility size. REVOLVER and SYND are indicator variables that equal unity if the loan is a revolving loan or syndicated, respectively. SECURED and SECUREDMISS are indicator variables that equal to unity if the loan is designated as secured by the database or if the securitization status is missing, respectively. FCOVENT1-12 are indicator variables that are equal to unity if there is are coverage covenants based on the fixed charge (FCOVENT1); debt service (FCOVENT2); interest (FCOVENT3); cash interest (FCOVENT4); leverage ratio (FCOVENT5); debt-to-cash flow (FCOVENT6); senior debt-to-cash flow (FCOVENT7); debt-to-tangible net worth (FCOVENT8); debt-to-equity (FCOVENT9); current ratio (FCOVENT10); tangible net worth (FCOVENT11); and net worth (FCOVENT12).

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	
ACPPC	[1]																								
DEBTTPC	[2]	1																							
RATEAISD	[3]	-0.13	1																						
BWMD	[4]	0.02	-0.21	1																					
BONDRATE	[5]	-0.34	0.26	-0.67	1																				
TICKER	[6]	0.05	0.29	-0.14	N/A	1																			
log(BWSSIZE)	[7]	0.18	0.17	-0.05	0.13	0.29	1																		
TFCMAT	[8]	-0.05	0.25	-0.51	0.52	0.41	0.18	1																	
log(AMTFCsiz)	[9]	0.04	-0.02	0.01	-0.26	-0.01	-0.05	0.01	1																
REVOLVER	[10]	0.02	0.26	-0.52	0.51	0.33	0.05	0.68	0.03	1															
SYND	[11]	0.07	0.07	-0.08	0.03	-0.03	0.08	-0.09	-0.02	0.00	1														
SECURED	[12]	0.07	0.08	-0.31	0.11	0.15	-0.07	0.44	0.07	0.58	-0.08	1													
SECUREDMISS	[13]	0.34	-0.11	0.41	-0.53	-0.01	0.18	-0.37	-0.01	-0.35	0.03	-0.33	1												
FCOVENT1	[14]	-0.36	-0.09	-0.27	0.31	-0.08	-0.28	0.26	0.03	0.24	-0.07	0.29	-0.82	1											
FCOVENT2	[15]	0.01	0.02	-0.01	-0.02	0.01	0.00	0.00	0.00	0.00	0.03	-0.02	0.02	-0.03	1										
FCOVENT3	[16]	0.01	0.02	-0.02	0.01	0.00	0.01	0.00	0.00	0.00	0.01	-0.01	0.02	-0.03	0.06	1									
FCOVENT4	[17]	0.01	0.01	-0.03	0.02	0.01	0.00	0.00	0.00	0.01	0.02	-0.01	0.01	-0.03	0.30	0.14	1								
FCOVENT5	[18]	0.01	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	-0.01	0.06	0.05	0.02	1							
FCOVENT6	[19]	0.01	0.01	-0.01	0.02	0.01	0.00	0.01	0.00	0.01	0.01	0.00	0.01	-0.02	0.25	0.07	0.26	0.04	1						
FCOVENT7	[20]	0.01	0.02	-0.01	-0.02	0.00	0.00	0.00	0.00	-0.01	0.02	-0.02	0.03	-0.04	0.54	0.17	0.53	0.12	0.16	1					
FCOVENT8	[21]	0.00	0.00	-0.01	-0.01	0.00	0.01	0.00	0.00	0.00	0.00	-0.01	0.01	-0.02	0.25	0.11	0.24	0.09	0.07	0.31	1				
FCOVENT9	[22]	0.00	0.01	-0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.02	-0.01	0.02	-0.03	0.13	0.31	0.13	0.01	-0.01	0.05	0.00	1			
FCOVENT10	[23]	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.01	-0.02	0.02	0.07	0.05	0.00	0.01	0.02	0.00	0.00	1			
FCOVENT11	[24]	0.01	0.01	-0.01	0.01	0.00	0.00	0.00	0.00	0.01	-0.01	0.02	-0.03	0.16	0.23	0.16	0.01	0.12	0.14	0.06	0.35	0.09	1		
FCOVENT12	[25]	0.00	0.02	-0.02	0.02	0.01	0.00	0.01	0.00	0.01	-0.01	0.01	-0.03	0.20	0.27	0.18	0.03	0.16	0.13	0.02	0.51	0.04	0.35	1	
		0.01	0.01	-0.02	0.01	0.01	0.01	0.00	0.01	0.02	-0.01	0.02	-0.03	0.31	0.12	0.29	0.05	0.22	0.35	0.15	0.09	0.07	0.12	-0.04	

Table 7: Regression tests, rated subsample. RATEAISD is the dependent variables. Independent variables are as follows: ACCPPC and DEBTPPC are indicator variables that are equal to unity if the loan facility has an accounting-based performance pricing covenant (PPC) or debt-rating-based PPC, respectively. RATEAISD is the basis point coupon spread over LIBOR plus the annual fee and upfront fee, spread over the life of the loan. BWMD is the Moody's senior debt rating, where the nonmissing ratings of Aaa through C are translated into an ordinal scale ranging from 28 to 8. TICKER is an indicator variable that is equal to unity if the borrower has a ticker symbol. BWSSIZE is the borrower's sales size. TFCMAT is the months to maturity. AMTFCISZ is the facility size. REVOLVER and SYND are indicator variables that equal unity if the loan is a revolving loan or syndicated, respectively. SECURED and SECUREDMISS are indicator variables that equal to unity if the loan is designated as secured by the database or if the securitization status is missing, respectively. FCOVENT1-12 are indicator variables that are equal to unity if there is are coverage covenants based on the fixed charge (FCOVENT2); debt service (FCOVENT3); cash interest (FCOVENT4); leverage ratio (FCOVENT5); debt-to-cash flow (FCOVENT6); senior debt-to-cash flow (FCOVENT7); debt-to-tangible net worth (FCOVENT8); debt-to-equity (FCOVENT9); current ratio (FCOVENT10); tangible net worth (FCOVENT11); and net worth (FCOVENT12).

	Pooled sample			Matched sample, ACCPPC			Matched sample, DEBTPPC		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept	693.06***	733.17***	838.09***	524.97***	463.99***	711.23***	526.71***	530.22***	767.47***
ACPPC	-24.81***	-22.78***	-7.27***	-30.53***	-36.51***	-28.91***	3.78	2.62	-4.59
DEBTPPC	-27.91***	-28.94***	-32.09***	-5.26***	-4.75***	-6.77***	-5.89***	-5.72***	-12.1***
BWMD	-13.02***	-14.32***	-15.75***	-0.83	-2.57	-0.31	-34.55***	-36.74***	-55.2***
TICKER	-5.51***	-10.95***	-4.17*	-7.36***	-6.51***	-8.32***	-18.38***	-19.02***	-27.47***
log(BWSSIZE)	-7.47***	-8.51***	-9.22***	0.48***	0.57***	0.57***	-0.26	0.62**	0.62**
TFCMAT	0.46***	-8.34***	0.57***	-7.58***	-5.74**	-8.08***	2.85	2.94	8.18
log(AMTFCISZ)	-9.47***	-26.34***	-11.3***	-17.18***	-19.06***	-17.59***	2.61	-6.11	-24.71
REVOLVER	-26.78***	18.52***	-29.23***	-38.62	-21.9	-39.69	26.65	29.16	38.2
SYND	9.14	63.3***	3.22	142.6***	168.02***		168.01***	160.98***	
SECURED	62.49***	7.93***		121.95***	139.52***		17.69**	18.35***	
SECUREDMISS	3.72	-1.12	-0.14	9.07	9.85	7.02	0.8	2.72	20
FCOVENT1	-0.01	-1.58	-3.8	-11.74	-12.67	-10.41	17.94	24.73	39.02
FCOVENT2	-1.17	-8.54*	-11.07**	-1.07	0.91	-2.53	5.26	5.93	10.42
FCOVENT3	-10.89**	-30.09	-19.78	-36.48	-27.78	-34.34	29.16	36.78	68.89
FCOVENT4	-31.48	3.93	3.26	38.79**	36.49**	42.81**	-18.13	-26.57	-68.79
FCOVENT5	3.24	6.79	7.3	22.18*	16.8	24.23*	-23.49	-24.33	-39.94
FCOVENT6	7.19	-18.47*	-16.52	0.06	-1.62	3.49	21.14	14.82	-2.11
FCOVENT7	-17.6*	-1.96	-3.86	-5.27	-1.13	-7.9	-9.5	-17.51	-69.13
FCOVENT8	-3.5	18.18	20.98	0***	34.28	0***	-2.07	-3.23	-15.6
FCOVENT9	13.89	2.08	1.6	-5.36	-8.86	-2.87	-0.71	4.28	24.03
FCOVENT10	1.28	-11.47**	-9.79*	-9.86	-15.94	-9.55	-0.14	2.62	19.45
FCOVENT11	-9.85*	-12.52**	-12.44**	-25.66*	-22.3	-27.83*	-47.9	-55.95	-110.04*
FCOVENT12	-10.02*	6033	5578	627	632	627	186	188	186
# Obs	5578	0.60	0.60	0.31	0.29	0.30	0.79	0.79	0.61
Adj-R2	0.64								

***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 level.

Table 8: Regression tests, unrated subsample. RATEAISD is the dependent variables. Independent variables are as follows: ACCPPC and DEBTTPC are indicator variables that are equal to unity if the loan facility has an accounting-based performance pricing covenant (PPC) or debt-rating-based PPC, respectively. RATEAISD is the basis point coupon spread over LIBOR plus the annual fee and upfront fee, spread over the life of the loan. TICKER is an indicator variable that is equal to unity if the borrower has a ticker symbol. BWSSIZE is the borrower's sales size. TFCMAT is the months to maturity. AMTFCISZ is the facility size. REVOLVER and SYND are indicator variables that equal unity if the loan is a revolving loan or syndicated, respectively. SECURED and SECUREDMISS are indicator variables that equal to unity if the loan is designated as secured by the database or if the securitization status is missing, respectively. FCOVENT1-12 are indicator variables that are equal to unity if there is are coverage covenants based on the fixed charge (FCOVENT1); debt service (FCOVENT2); interest (FCOVENT3); cash interest (FCOVENT4); leverage ratio (FCOVENT5); debt-to-cash flow (FCOVENT6); senior debt-to-cash flow (FCOVENT7); debt-to-tangible net worth (FCOVENT8); debt-to-equity (FCOVENT9); current ratio (FCOVENT10); tangible net worth (FCOVENT11); and net worth (FCOVENT12).

	Pooled sample			Matched sample, ACCPPC		Matched sample, DEBTTPC			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept	776.35***	798.7***	1005.13***	488.64***	451.38***	613.39***	276.56***	408.65***	1095.37***
ACPPC	-29.09***	-30.41***	-12.82***	-35.28***	-41.82***	-27.14***			
DEBTTPC	-32.13***	-32.67***	-45.48***				0.27	9.66	10.31
TICKER	-7.52***	-7.56***	-4.61**	-1.66	-5.98	1.03	5.17	-20.39	-92.5**
log(BWSSIZE)	-13.14***	-14.18***	-16.82***	-5.82***	-6.92***	-3.34	-20.74***	-20.91***	-8.28
TFCMAT	0.01		0.01	0.51***		0.82***	0.43*		0.51
log(AMTFCISZ)	-20.06***	-20.32***	-25.69***	-12.29***	-7.89***	-17.04***	10.3	5.41	-38.84**
REVOLVER	-24.53***	-23.42***	-27.74***	-12.77*	-13.57**	-15.87**	-9.54	3.07	-33.18
SYND	3.44	7.2***	-2.68	-5.2	5.89	-17.71			
SECURED	92.44***	91.18***		113.31***	123.05***		208.44***	207.92***	
SECUREDMISS	17.88***	21.8***		50.17***	53.96***		23.66	18.66	
FCOVENT1	1.97	1.08	4.15	-9.64	-17.76	-18.79	45.46	52.52	15.99
FCOVENT2	-2.41	-3.19	-2.02	-7.48	-6.91	-10.14			
FCOVENT3	-7.65*	-7.43*	-9.86**	-16.57	-15.34	-14.33	-46.5	-38.15	43.15
FCOVENT4	15.41	18.22	1.31	-83.76	-74.04	-74.05	47.6***	33.74***	-4.86***
FCOVENT5	-2.49	0.39	-0.42	-6.12	4.01	-18.47	-13.17	8.92	55.75
FCOVENT6	-5.28	-4.39	-5.34	28.08*	33.33**	37.65**	-54.85	-70.8	-11.97
FCOVENT7	-3.21	-3.08	-1.49	-11.09	-25.5	-13.94			
FCOVENT8	-2.56	-3.02	2.24	-0.01	11.1	-2.31	38.79	35.26	-30.89
FCOVENT9	-10.88	-9.39	-13.31	-16.93	-12.35	-12.11			
FCOVENT10	2.3	2.9	6.55	-2.75	0.06	8.1	37.36	17.85	-31.01
FCOVENT11	-1	-1.69	-3.21	23.03	10.03	23.9	-25.42***	-13.79***	-9.6***
FCOVENT12	-1.06	-2.11	1.79	7.33	4.07	12.4			
# Obs	13046	14678	13046	935	964	935	66	66	66
Adj-R2	0.41	0.40	0.33	0.23	0.21	0.15	0.65	0.63	0.26

***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 level.