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Evidence on the Determinants and Economic Consequences of Delegated Monitoring

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Abstract

We investigate delegated monitoring by examining the determinants and effects of including cross-acceleration provisions in public debt contracts. We find that cross-acceleration provision use depends on borrowers' going concern relative to liquidation values, debt repayment structures, credit quality, and financial reporting quality. This suggests that the use of cross-acceleration provisions increases when the costs of cascading defaults are lower, the conflicts between creditor classes are higher, and the benefits of delegating monitoring to banks are higher. We also find a lower interest rate on public debt contracts with cross-acceleration provisions, but the rate reduction depends on borrowers' financial reporting quality.

1. Introduction

A central premise of financial intermediation is that creditors serve an important corporate governance role by monitoring borrowers. Smith and Warner (1979) (among others) suggest that financial covenants are one important contract feature creditors use to influence borrowers' behavior. Research has shown that accounting-based covenant use in public debt has declined dramatically over the last three decades.[1] The decline in accounting-based covenants in public debt raises questions about whether public debt holders still serve an important monitoring role, and if so, whether outputs from the borrower's accounting system are important in the monitoring function.

We investigate the public debt holders' monitoring role, by focusing on their decision to delegate monitoring to "credible" specialists. The finance literature has long recognized when borrowers have multiple classes of lenders, the benefits of monitoring may be reduced by either free rider problems or duplication of monitoring efforts (Diamond, 1984). Delegating monitoring to "credible specialists" can mitigate these problems and reduce monitoring costs (Fama, 1990); however, the delegated monitor's incentives to shift wealth from other claimants can be costly. For example, Bulow and Shoven (1978) suggest that when there are conflicts-of-interests among multiple classes of claimants, delegating monitoring may lead to inappropriate liquidation decisions. We focus on the use of cross-acceleration provisions in the public debt market to provide evidence on the costs and benefits of delegated monitoring generally, and specifically to enhance our understanding of the role of accounting in public debt contracting.

By requiring accelerated debt repayment when any other debt payment is accelerated, cross-acceleration covenants allow one class of lenders to delegate

[1] Begley and Freedman (2004) report that after the 1990's public debt rarely includes financial covenants.

monitoring to credible specialists without jeopardizing their repayment priority. Based on prior research (e.g., Diamond, 1991, and Rajan, 1992), we argue that one reason public debt holders use cross-acceleration provisions to delegate monitoring to banks is because public debt holdings are less concentrated and hence more costly to renegotiate. Furthermore, bank debt typically has financial covenants allowing either accelerated payments or requiring borrowers to take actions to preserve lenders' claims when borrowers' performance deteriorates.

We first examine what determines the use of cross-acceleration provisions in public debt contracts. Cross-acceleration provisions can affect the value of the borrower's combined debt claims by increasing the likelihood of borrower liquidation due to cascading defaults. Liquidation can be either value increasing or reducing, depending on the liquidation and continuation value of the borrower on the liquidation date. We expect cross-acceleration provisions to be less likely when they are more likely to induce value-reducing cascading defaults.[2] Thus, we hypothesize that public debt contracts are less likely to include cross-acceleration provisions when the ratio of the borrower's expected continuation to expected liquidation value is high. Cross acceleration provisions are also more likely when credit risk is high, since the expected value of total debt claims in liquidation relative to their continuation value will be increasing with credit risk.[3]

Cross-acceleration provisions also can affect the distribution of claims among creditors. We predict that when conflicts of interest among banks and other claimants are

[2] Although less extreme than cross-default provisions triggered by any default event including technical covenant violations, cross-acceleration provisions increase the risk that cascading defaults lead to liquidation when borrowers' liquidation values are substantially lower than their values in place. Unlike cross-default provisions, cross-acceleration covenants allow borrowers to either cure or obtain waivers for their technical defaults without triggering public debt repayment.

[3] Our numerical example in appendix A demonstrates the relation between credit risk and cross-acceleration use.

greater, the likelihood that public debt contracts include cross-acceleration provisions increases. We predict that the likelihood of conflicts between different lender classes will depend on the timing of required debt repayments and the going concern value of the borrower. More specifically, without cross-acceleration provisions, deterioration in the borrower's credit quality encourages banks to accelerate their payments ahead of those of public debt holders regardless of borrower's going concern versus liquidation value. The presence of a cross-acceleration provision can alter that incentive. When the public debt contains a cross-acceleration provision banks will still find acceleration advantageous when the borrower's going concern value relative to liquidation value is low, but for higher going concern to liquidation ratios banks' incentives to accelerate payments will decrease with the amount of public debt due after the bank debt matures. The payment acceleration incentive is mitigated under these circumstances because the bank's claims will be diluted if they accelerate payments.

We also hypothesize that public debt will be more likely to include cross-acceleration provisions when banks are relatively more capable monitors and have greater incentives to exert effort. We argue that banks are more likely to be "credible specialists" with incentives to monitor when they hold a larger proportion of the borrower's debt, and when information asymmetries are large. We also argue that the monitoring benefits of banks' access to proprietary information will be inversely related to the borrower's financial reporting quality. We therefore expect cross-acceleration provisions will be more common for borrowers with lower accounting quality.

We next investigate whether cross-acceleration provisions affect the public debt interest rate. The effect of cross-acceleration provisions on interest rates will depend on several factors, including the costs of cascading defaults, the benefits of avoiding being disadvantaged through wealth transfers, and the benefits associated with avoiding duplicate monitoring. In addition, by including cross-acceleration provisions in the debt contract, public debt holders rely more on banks' monitoring, and the actions that they take if the borrower defaults. Thus, the benefits of cross-acceleration also depend on banks receipt of timely and accurate default signals. Finally, we also extend Bharath et al.'s (2008) finding that accounting quality affects public debt interest rates by examining whether this effect differs for debt with versus without a cross-acceleration provision.

To test our hypotheses, we identify 1,670 public debt issues (of 515 firms) with contract terms available in machine-readable format on the FISD database. Specifically, we require information on whether the contract includes a cross-acceleration provision, and for the interest rate analysis, we also require data on the spread charged in the contract.[4] Given that cross-acceleration provisions are not uniformly beneficial, it is not surprising that cross-acceleration provisions are not ubiquitous. We find that roughly 62% of the sample public debt issues have cross-acceleration provisions.

Our results are consistent with our hypotheses. Specifically, we find that cross-acceleration provisions are less likely when the expected value of the borrower as a going concern is higher relative to its expected liquidation value, consistent with concerns that cross-acceleration covenants may cause sub-optimal liquidation. This effect is mitigated as the amount of debt due after the typical maturity of the bank debt increases. We also find that cross-acceleration provisions are less likely when the borrower has higher credit risk (i.e., smaller size and worse credit rating). These results support our hypothesis that cross-acceleration provisions help align lenders' interests.

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[4] We test our bank monitoring quality hypothesis using sample firms with lender ownership information from a syndicated loan obtained within 6 years before public debt issuance. We collect bank loan data from the LPC Dealscan database.

We further find that cross-acceleration provisions are more prevalent in public debt contracts when lead banks have stronger incentives to monitor. Specifically, we find that public debt is more likely to include cross-acceleration provisions when the lead lender holds a relatively larger or more concentrated share of the borrower's outstanding loans at the time of the public debt issuance.[5] In addition, we find that the use of cross-acceleration provisions increases with the number of financial covenants used in bank loans.[6] These findings suggest that cross-acceleration provisions are more common when delegated monitors have greater incentives to be a "credible specialist." We also find greater use of cross-acceleration provision for borrowers with higher absolute value of discretionary accruals and thus larger information asymmetry problems.

We also document that the treasury spread charged on public debt agreements containing this provision is 62 basis points lower than public debt without the provision estimated using a Heckman model. The magnitude of our results is economically significant given an average sample spread of 156 basis points over the treasury rate. This result suggests that on average the expected value of the public debt claim is higher when the public debt includes a cross-acceleration provision. We further find that the presence of a cross-acceleration provision creates a positive association between the public debt interest rate and the absolute value of discretionary accruals. This finding suggests that accounting information affects the design of the public debt contract when it includes cross-acceleration provisions delegating monitoring to banks, which rely heavily on accounting-based covenants in monitoring firms.

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[5] We measure the concentration ratio and lenders' ownership in a bank loan at inception. Noise in this proxy may be induced by subsequent banks actions taken to change their exposure to the borrower that are not captured by the LPC database or in other publically available sources.

[6] We find a positive association between loan covenant and cross-acceleration provision use after controlling for endogeneity of banks' monitoring incentives.

Our paper extends the cross-monitoring literature by explicitly considering factors influencing cross-acceleration covenant use. Both Booth (1992) and Datta et al. (1999) focus on whether one type of lender benefits from the existence of other lender types. Neither explores the explicit mechanism through which cross-monitoring benefits lenders. More importantly, neither considers potential agency costs arising from multiple lenders and cross-monitoring. We address these issues by providing evidence that public debt holders use cross-acceleration covenants to explicitly delegate monitoring to banks, and that cost-benefit tradeoffs induce cross-sectional variation in the demand for delegated monitoring.

We also contribute to the debt covenant and financial reporting quality literatures. Our finding that accounting information affects inclusion of cross-acceleration provisions in public debt contracts, suggests that accounting is important in monitoring borrowers even after the elimination of financial covenants from public debt contracts. For public debt with cross-acceleration provisions, accounting still plays an important, although delegated, monitoring role. Our finding that accounting quality impacts the public debt interest rate only in the presence of a cross-acceleration provision suggests that accounting information is priced in indentures because of banks' use of accounting-based covenants. This finding also extends the results in Bharath et al. (2008) who find that accounting quality affects public debt interest rates *on average*, but does not affect other terms of the public debt contract (like maturity or collateral). This suggests that accounting has a relatively more nuanced role in the public debt contract. When accounting quality is poor, public debt contracts are more likely to both include cross-acceleration provisions and to charge the borrower a premium.

The rest of the paper is organized as follows. Section 2 provides background for our study. We develop our hypothesis in Section 3. We describe our sample in Section 4 and our research design in Section 5. We present our empirical results and supplementary analysis in Section 6 and conclude in Section 7**.**

2. Background and Motivation

2.1 Cross-Default versus Cross-Acceleration Covenants and Delegated Monitoring

Smith and Warner (1979) indicate that financial covenants are an important mechanism used by lenders to monitor borrowers. Watts and Zimmerman (1986) extend these arguments by highlighting that inclusion of financial covenants in debt contracts provides managers with incentives to make accounting choices to avoid covenant violations. They also suggest that lenders rationally anticipate the use of this discretion and price-protect themselves. Building on this research, Bharath et al. (2008) find that firms have poor accounting quality pay higher rates on both bank loans and public debt.

However, recent studies by Begley and Chamberlain (2005) and Begley and Freedmen (2004) indicate the declining use of financial covenants in public debt. Diamond (1991) and Rajan (1992) both suggest that covenant use by banks is likely more prevalent because their contracts are relatively less costly to renegotiate than public debt contracts. Public bonds are often diffusely held making renegotiation more difficult, especially since renegotiation of public debt typically requires agreement of two thirds of the bondholders. Consistent with their arguments, Begley and Freedman (2004) find that less than 5% of the public debt agreements contain financial covenants for their sample of 1990's bond contracts. This questions the usefulness of firms' accounting system in public debt holders' monitoring role. In this paper, we suggest that some public debt holders delegate their monitoring decisions through the use of cross-acceleration covenants, and that these covenants provide for a more nuanced role of the firm's accounting system in the monitoring of the borrower.

More specifically, lenders often explicitly include either cross-default or cross-acceleration covenants in debt contracts. Although these two covenants are often loosely defined or used interchangeably (Taylor and Saneson, 2006), there is a fundamental difference between them. Specifically, cross-default provisions are triggered by any event of default including technical covenant violation, while cross-acceleration provisions are only triggered when the monitor demands early repayment. This difference has important implications for the use of these two covenants.

For example, when Amkor Inc failed to file its financial statements in a timely manner it resulted in a technical default on at least one tranche of their public debt. Bondholders within this tranche used this technical default to declare an event of default and demand acceleration of payments if the default was not cured in 60 days. Other debt with cross-default provisions could have used the technical default to also demand repayment. In contrast, bondholders with cross-acceleration covenants could only force payment acceleration if debt repayment was accelerated due to the technical default. Thus, unlike lenders with cross-default provisions, lenders with cross-acceleration provisions could only demand repayment if Amkor failed to cure the default and were forced to repay the debt early.

The practitioner literature suggests that the distinction between cross-acceleration and cross-default is particularly important when the borrower has debt with varying seniority. For example, Widen (2002) suggests that to secure their position at renegotiation without interference from subordinated-debt holders (public debt in our case), senior-debt holders (banks in our case) usually impose more restrictive covenants on the borrower than do subordinated-debt holders.[7] In addition, she also suggests that senior debt (banks) should also cross default to other significant indebtedness of the debtor, particularly to the subordinated debt, to ensure that banks are included in any workout negotiations. That is, if there is a default (technical or otherwise) the bank uses the cross-default provision as a mechanism to investigate the circumstances surrounding the default, and either accelerate payments or change other contract provisions in response to the default. She suggests that, subordinated debt should be allowed to include a cross-acceleration provision. In doing so, subordinate debt holders do not take part in the renegotiation after defaults, but their interests can be protected if senior-debt holders decide to accelerate the payments.

Consistent with Widen's (2002) arguments, we find that cross-acceleration provisions are often found in public debt contracts.[8] Of the 5,910 public debt agreements on the FISD database with covenant data, roughly 60% include cross-acceleration provisions. In contrast, cross-default provisions are observed in less than 4% of the public debt agreements covered on the FISD database (less than 2% in our sample).[9] Since cross-default provisions are rare in public debt contracts, our study focuses on cross-acceleration provisions.

Banks access to borrowers' private information provides them with a comparative advantage when monitoring borrowers. In addition, banks complex relationships with

[7] A widely accepted premise in the academic literature is that bank debt is senior to public debt (Longhofer and Santo, 2003). Bank debt has more restrictive covenants and includes stricter cross-default covenants than indenture agreements. Paris (2000) finds observations consistent with these predictions in practice.

[8] We hand collected a subsample of 40 bank debt contracts and found they almost always contained cross-default provisions, and none contained cross-acceleration provisions.

[9] Since our sample spans several years we examined the whether there was any inter-temporal variation in the use of cross-acceleration provisions. We found no clear inter temporal pattern. Peak usage occurs in 1996 and 2005, with the least usage in 2003. There is a lot of variation across years (2003 had a low of 43% while 2005 had a high of almost 70%).

corporate borrowers involving other banking services provides economies of scope. For these reasons, banks are unlikely to delegate monitoring to other lenders; instead, they prefer to engage in their own monitoring. Although these broad banking services generate specialized knowledge about borrowers' financial condition, they may also affect banks incentives to demand loan acceleration if the fees generated by these services would be affected. This suggests that there is likely to be cross-sectional variation in banks' monitoring incentives. Banks may shirk in monitoring, especially if they do not have a strong reputation for providing high quality monitoring or if they receive substantial fees for providing non-banking services.

2.2 Cross-Acceleration Covenants and Conflicts of Interests among Classes of Claimants

Bulow and Shoven (1978) develop a model and use numerical examples to suggest that lenders' decisions to continue or liquidate a borrower may not maximize total value when multiple classes of claimants have conflicting interests with respect to their claims on assets and income flows. We extend this analysis by showing that cross-acceleration covenants can potentially align the interests of the classes of lenders. By stipulating that debt repayment must be accelerated when the payment on any other debt is accelerated, cross-acceleration provisions make the claims of all lenders due at the same time, increasing the chances that the borrower is liquidated. For a borrower with a liquidation value that exceeds its going concern value, the cross-acceleration provision prevents wealth shifting from other lenders to the delegated monitor and increases the total value. In Example 1 of Panel A of Appendix A we provide extended versions of the Bulow and Shoven (1978) examples that illustrate this possibility.

In contrast, cross-acceleration provisions could lead to an inefficient liquidation of a borrower if a cascading default is triggered and the borrower is worth more as a going concern (than in liquidation).[10] For example, The Report of the Bank of England Task Force on Major Operational Disruption in the Financial System states that:

> The Task Force has also found that there may be potential problems with the use of cross-default clauses where there is a risk that a default under one contract could trigger a cascade of defaults under many other contracts. … The Task Force believes that parties to contracts should consider carefully the limitation of the operation of cross-default and cross-acceleration provisions …The potential risk of cascades of defaults could be addressed through suitable defence provisions, including:
>
> - use of a narrow definition of the types of default capable of triggering cross-default provisions;
> - use of thresholds;
> - and use of grace periods.

If the value of the borrower remaining in business is greater than its liquidation value, then cascading defaults that force liquidation are costly to all claimants (including lenders), especially if the liquidation value of the assets does not exceed the face value of the debt that must be repaid (see Example 3 of Panel A of Appendix A).

Recognizing the potential for triggering cascading defaults, the existence of a cross-acceleration covenant could reduce the monitor's incentives to demand early repayment, thereby reducing the likelihood of borrower liquidation (see Panel C of Appendix A). This increases total value if the borrower's liquidation value is lower than its going concern value.

2.3 Delegated Monitoring –Empirical Literature Review

Previous empirical research focusing on cross monitoring by lenders includes Booth (1992) and Datta et al. (1999). Both of these papers consider how interest rates are affected by the presence of another type of lender. Booth (1992) examines how past public debt issues affect the rates charged on bank loans while Datta et al. (1999) examine how the existence of a banking relationship affects the rate charged on initial

[10] Brigham and Ehrhardt (2008) describe this "common pool problem" as the incentive for each individual creditor to "foreclose on the firm even though it is worth more as an ongoing concern."

public debt offerings. Both papers find that the presence of another lender results in a reduced rate on the newly issued debt. This cross-monitoring literature tests whether the implicit contract between different classes of lenders improves firms' credit quality and benefits other lenders. We extend this literature by examining an explicit cross-monitoring mechanism (i.e., cross-acceleration provision) that allows public debt holders to directly benefit from the monitoring performed by banks and by investigating the costs, not just the benefits, of having such cross-monitoring mechanism.

3. Hypothesis Development

The existence of a cross-acceleration provision can affect the value of the combined debt claims on the borrower by increasing the likelihood of cascading defaults that result in the borrower's liquidation. When borrowers are worth more in liquidation than as a going concern, cross-acceleration provisions can potentially result in value increasing liquidation. That is, when a firm with a low ratio of going concern to liquidation value defaults on their bank debt, the cascading defaults associated with cross-acceleration provisions will likely result in a value increasing liquidation (see Ex. 1 in Panel A of Appendix A).

For borrowers with a going concern value in excess of their liquidation value, the cascading defaults that can result from cross-acceleration provisions can result in a value decreasing liquidation. That is, if it is in the bank's best interest to demand early repayment despite the decrease in overall borrower value that results from liquidating a firm with a higher going concern value, then the cross-accelerating provision increases the costs associated with technical default of their financial covenants. (See Ex. 3 of Panel A of Appendix A).

Even in the absence of a differential between the expected liquidation and going concern value, the relative benefit of liquidation caused by cross-acceleration provisions will differ for public debt holders based on the risk associated with the borrower's going concern value, since the value of upside potential is shared with equity holders. (See Panel B of Appendix A).

We expect the benefit of cross-acceleration provisions at the time of the public debt issuance to be greater when the borrower's expected liquidation value is likely to exceed its expected going concern value. We further predict that cross-acceleration provisions in public debt contracts to be more likely when the borrower's downside risk is greater. Based on these arguments our first hypothesis is:

H1: Public debt indenture agreements are less likely to include cross-acceleration provisions when the likelihood and cost of cascading defaults is higher.

In addition to altering the value of the combined debt claims, cross-acceleration provisions can also affect the distribution of claims among creditors. We predict that when there are greater conflicts of interest among banks and other claimants, the likelihood that public debt contracts include cross-acceleration provisions increases. We also predict that the likelihood of conflicts between different classes of lenders will vary with the timing of required debt repayments for certain borrowers depending on their going concern to liquidation value. Specifically, without cross-acceleration provisions, in the event of default, banks will have an incentive to accelerate their payments ahead of those of public debt holders regardless of the borrower's going concern versus liquidation value, thereby reducing public debtholders' interests when liquidation value is relatively low. The existence of a cross-acceleration provision can alter that incentive and align banks' and public debtholders' interests. (See Panel C of Appendix A.) Although this incentive will still exist when the borrower's going concern to liquidation value is low, for higher going concern to liquidation values, the bank's incentives to accelerate its payments will be decreasing in the amount of public debt due after the bank debt matures in the presence of a cross-acceleration provision\ because the bank's claims will be diluted if they accelerate payments.

Based on these arguments, we expect the creditor coordination benefits of cross-acceleration provisions to be greater when a greater proportion of the total debt is due after the maturity of the bank debt for borrowers with higher going concern to liquidation values. Thus our second hypothesis is:

H2: Public debt indenture agreements are more likely to include cross-acceleration provisions when the conflicts of interests between classes of lenders are greater.

We also expect that the benefits of cross-acceleration provisions to public debt to increase with the efficacy of delegated monitoring. These benefits are the greatest when the delegated monitor is more efficient (or effective) at monitoring and has incentives to provide high quality monitoring. Although banks' superior access to private information and lower renegotiation costs provide banks a comparative advantage when monitoring borrowers relative to public debt holders, there is likely to be cross-sectional variation in banks' monitoring incentives. Banks may shirk in monitoring, especially if they do not have a strong reputation for providing high quality monitoring or if the lending banks also charge substantial fees for providing non-banking services.

We argue that the public debt holder's benefits from cross-acceleration provisions will be larger when the delegated lender has stronger incentives to provide higher quality monitoring. If banks utilize timely and accurate signals of deterioration in credit quality then delegated monitoring provides a lower-cost monitoring alternative for the public debt holders than direct monitoring. However, if the bank shirks as a monitor, or does not exert sufficient effort to correctly classify the borrower's type, then delegated monitoring can increase both the public debt holders' and the borrower's losses. More specifically, if the bank acts either too quickly (e.g., triggering unnecessary cascading defaults) or not quickly enough in default decisions then the benefits of relying on delegated monitoring are likely to be low. To isolate banks' incentives to provide higher quality monitoring we follow the estimation technique used by Ivashina (2009), which we discuss in detail in the research section. We also expect that banks are likely to be more effective monitors when the borrower's performance is more difficult to measure at inception or over the life of the debt issuances. Banks have access to private information that they can use at contract inception and over the life of the contract to develop a better understanding of the firm's credit quality. Based on these arguments, our third hypothesis is:

H3: Public debt indenture agreements are more likely to include cross-acceleration provisions when bondholders benefit more from banks' monitoring actions.

Based on these costs and benefits, the interest rate charged on public debt that includes cross-acceleration provisions could be either higher or lower than that on public debt without these covenants. Even though public debt holders can save monitoring costs by relying on bank's monitoring using cross-acceleration provisions, there are conditions where the cross-acceleration provisions allow banks to shift wealth from bondholders and shareholders to themselves. In addition, even though in some cases cross-acceleration provisions may reduce the monitors' ability to shift wealth from public debt holders to themselves, this does not necessarily imply that cross-acceleration provisions increase the expected pay-off on the public debt (see Ex. 3 of Panel A of Appendix A). As a result, the value of the public debt can be either higher or lower in the presence of cross-acceleration provisions because the provisions can alter the likelihood that the borrower is liquidated or continued in circumstances where it is (or is not) value maximizing.

H4: The interest rate spread charged on public debt with cross-acceleration provisions differs from that charged on public debt without this provision.

Bharath et al. (2008) provide evidence that public debt holders price-protect themselves, charging firms with lower accounting quality a higher interest rate., We expect public debt with a cross-acceleration provision to be more likely to include price protection against poor accounting quality since public debt seldom has financial covenants but banks rely on accounting-based covenants to monitor borrowers. That is, for a public debt agreement with a cross-acceleration provision the importance of accounting quality should be enhanced due to the use of financial covenants in the bank debt and the acceleration of payment that can result from a covenant violation. Thus firms with poor accounting quality should suffer from greater price protection due to banks' usage of accounting information when there are cross-acceleration provisions. This leads to our fifth and final hypothesis.

H5: The association between interest rate spreads and accounting quality is higher for public debt contracts with cross-acceleration provisions than those without.

4. Research Design

We conduct two analyses to test our hypotheses. In the first analysis, we investigate the determinants of the decision to include cross-acceleration provisions in public debt agreements. In the second analysis we examine the effects of cross-acceleration provisions on the interest spread charged in the public debt agreement.

To test our hypotheses we focus on the characteristics of the borrower and their bank debt at the time that the public debt is issued. There are two important assumptions implicit in this research design. First, the bank debt holders may not stay constant over the life of the public debt, although we assume that the quality of the monitoring will remain constant. Second, the repayment schedule of the public debt and private debt affects the potential costs and benefits of cross-acceleration provisions, and the repayment schedule may change over the life of the public debt. Similarly, we assume that the repayment schedule of the debt will be relatively constant over the life of the public debt. That is, firms refinance similar bank/public debt when the old debt matures to maintain a consistent repayment schedule.

To test our first hypotheses that pubic debt is more likely to include cross-acceleration provisions when the expected costs of cascading defaults are lower, we create a variable, **PL Ratio,** which measures the borrower's expected going concern value scaled by its expected liquidation value.[11] We measure the going concern value using the market value of total assets (total assets – book value of common equity – deferred tax + market value of common equity). We measure the liquidation value of assets in forced sales resulting from cascading defaults caused by cross-acceleration covenants by using Berger et al.'s (1996) estimate of asset tangibility: 0.715* accounts

[11] The value of the cross-acceleration provisions will depend on the relation between the liquidation value and expected going concern value at the technical default date. The decision to include the cross-acceleration provisions in the public debt agreement will be based on EXPECTED values for these variables as of the contracting date. We proxy for these expected values using the borrower's liquidation value and going concern value at contract initiation, assuming that current values provide public debt holders with the best estimate of the value of these variables at the technical default date. We do not directly incorporate the variance of these values when estimating debtholders' expected values for these implicit put options, although we do separately control for the variance of these variables in our models.

receivable + 0.547* inventory + 0.535*PPE (Property, Plant and Equipment) + 1*cash. We use the tercile rank of this variable (**PL Ratio_Rank**) to reduce measurement error and to capture potential non-linearities in our model.[12] We expect the use of cross-acceleration covenants will be less likely when borrowers have higher **PL Ratios** based on H1.

We use three variables to test the effect of going concern risk on the decision to include cross-acceleration provisions in public debt contracts. Our first measure is the firms' credit rating, **SP Rate,** which is a transformation of the S&P rating, from 1 (AAA) to 22 (D).[13] Borrowers with worse credit ratings have more downside risk and we predict that they should be more likely to have cross-acceleration provisions. Our second variable is the standard deviation of returns, **STD Ret,** which is measured as the standard deviation of the residuals from the market model using daily returns of the year prior to the debt issuance. We require at least 100 observations of daily returns to be included in the market model. This measure captures both the upside and downside going concern risk. Our final measure is a measure of firm size, **Size**, which is calculated as the natural log of sales the year before they enter into the public debt agreement. Larger borrowers are assumed to be less risky. Based on **H1**, we expect that cross-acceleration provisions are more beneficial to public debt holders and therefore are more likely to be used for smaller firms, more covenants, higher return volatility, or a worse credit rating, because these firms have higher downside risk.

[12] We find similar results when we dichotomize the PL Ratio, use quintile ranks or use quartile ranks..

[13] We collect the S&P ratings from the FISD database because approximately 11% of public debt issuers lack data item 280 in COMPUSTAT at issuance. Ratings in FISD are issue specific and we employ the first S&P rating that incurs within 6 months of the issuance date for each public debt. In the rate cases where the S&P is not available, then we use Moody's ratings instead (less than 3% of our sample). Public debt not rated by either S&P or Moody's (54 debt issues, 3% of our sample) is removed from the sample.

To test our second hypothesis that inclusion of cross-acceleration provisions increases with conflicts of interests between classes of lenders, we first examine whether the association between PL Ratio and the likelihood of cross-acceleration provisions depends on the repayment structure of the existing debt. To test this hypothesis, we measure the repayment structure of existing debt as the tercile rank of long-term debt (debt due in more than one year) plus the offering amount of the public debt issuance to total debt plus the offering amount of the new public debt (**Repay_Rank**). Based on H2, we expect the coefficient on **PL Ratio_Rank** interacted with **Repay_Rank** to be positive, while we do not have a prediction on **Repay_Rank**.

We test our third hypothesis by examining whether the difficulty of measuring borrower performance and banks' monitoring incentives are related to the likelihood of including cross-acceleration provisions in public debt indentures. If, as hypothesized, public debt indentures are more likely to include cross-acceleration provisions when bondholders benefit more from banks' monitoring actions, then we expect a higher incidence of cross-acceleration use when borrower's performance is more difficult to measure and when the bank's incentives to monitor are greater.

To test whether bondholders are more likely to employ this provision when it is more difficult to measure the borrower's performance, we use a measure of accounting quality, developed by Bharath et al. (2008), to proxy for the borrower's information environment. Dechow et al. (2010) suggest that there are a variety of problems associated with the use of existing accounting quality measures. Of these, the one problem most relevant to our study is that of construct validity. More specifically, Dechow et al (2010) suggest that researchers should be concerned that the measures of accounting quality employed in their paper capture the inherent difficulty associated with measuring borrower's performance rather than a correlated variable, such as default risk.

To address this concern we follow the factor analysis procedure used in Bharath et al. (2008). We define the variable **Accruals** as the first principal component of three commonly used metrics of accounting quality for each Fama/French industry classification. The detailed measurement of this variable is described in Appendix B. By using a principle component analysis, we identify a factor from three common measures of accounting quality, and thus reduce the noise associated with each individual measure. We also include measures of default risk in the model, to reduce the likelihood that our measure is actually measuring default risk.[14] We assume that the performance of firms with higher discretionary accruals is more difficult to measure. Consistent with **H3**, we expect that public lenders of firms with more information asymmetry (i.e., high **Accruals**) to benefit from delegated monitoring.

We test whether the quality and incentive of private lenders' monitoring affects the likelihood of using cross-acceleration provisions using three different measures of lenders' monitoring incentives. Our first two measures are based on the arguments in Sufi (2007) and Ivashina, (2009) that the share of the loan held by the lender deviates from the amount that would be dictated by diversification needs due to the lead lenders inability to commit to conducting proper due diligence and monitoring. The first proxy is a lender Herfindahl index, **Herf,** which is calculated for each borrower. To construct this index, we calculate the Herfindahl index for each loan deal issued by the firm by summing up the squared ownership by each bank, scaled by 10,000. We then define **Herf** as the

[14] While the principle component analysis reduces the likelihood that our accounting quality measure is simply an alternative default risk measure, it does not rule out this possibility, so the results should be interpreted with this caveat.

average of the Herfindahl index of these bank loans issued within six years before the issuance of the public debt. The second variable, **Lead Share,** is calculated as the average percentage of the loans held by the lead arrangers' for all bank loans issued within six years before the issuance of the public debt. Lead lenders with a relatively larger percentage of the loans are assumed to have stronger incentives to provide better monitoring (). Concentrated lenders are assumed to have stronger incentives to provide high quality monitoring.[15] Finally, since banks' monitoring incentive and intensity also manifest in the use of financial covenants in bank loans, we argue that the use of cross-acceleration provisions increases with the number of financial covenants (**Fin Cov**) used in bank loans.

In addition to our test variables, we also include other debt contract variables that could affect the decision to include a cross-acceleration provision in the public debt. We include **Maturity,** which is measured as the natural log of the maturity of the public debt obligation measured in months, to capture the effects of debt maturity that extend beyond the maturity of the existing bank loan contracts. We also allow for the possibility that the size of the public debt agreement will be related to the decision to use a cross-acceleration provision. We measure the size of the indenture, **Offer Size,** as the natural log of the offering amount. We expect larger public debt issuances to be more likely to have cross-acceleration provisions. We also include the seniority of the public debt as a control variable. We use an indicator variable equal to 1 if the debt is senior, **Senior**, and zero otherwise. Finally, we include firm characteristics as control variables, e.g., **Leverage** (total debt/total assets), **CFO** (cash flow from operation/total assets), **PPE**

[15] In addition to using the percentage of the loans held by lead arrangers, we also consider that banks' incentives to monitor increases with the ownership size (in dollars). Instead of adding a third proxy, we follow Ivashina's (2009) approach by incorporating the size of investment as an instrumental variable.

(Property, Plant and Equipment/total assets), and the standard deviation of **PL Ratio** (**STD PL Ratio**)

To estimate our model of the likelihood of inclusion of a cross-acceleration covenant we create an indicator variable, **Crss_Accl,** which is one if the public debt agreement has a cross-acceleration provision; zero otherwise. We then estimate the following Probit regression to examine the determinants of the decision to include this provision in the contract:

$$\begin{aligned}\textbf{Crss\_Accl} = {} & \beta_0 + \beta_1\text{*PL Ratio\_Rank} + \beta_2\text{*SP Rate} + \beta_3\text{*STD Ret} + \beta_4\text{*Size} + \beta_5\text{*} \\ & \text{Repay\_Rank} + \beta_6\text{*PL Ratio\_Rank *Repay\_Rank} + \beta_7\text{*Accruals+} \\ & \beta_8\text{*Herf} + \beta_9\text{*Fin Cov+ }\beta_{10}\text{*Maturity} + \beta_{11}\text{* Offer Size} + \beta_{12}\text{*Senior} + \\ & \beta_{13}\text{* Leverage} + \beta_{14}\text{* CFO} + \beta_{15}\text{* PPE} \\ & + \beta_{16}\text{ *STD PL Ratio+ }\varepsilon \qquad (1)\end{aligned}$$

<u>Variable Definitions:</u>

Crss_Accl: An indicator variable that equals one if the public debt agreement includes a cross-acceleration provision, and zero otherwise.

PL Ratio_Rank: The tercile rank of the ratio of firm's value of continued operation to liquidation value, where value of continued operation is calculated as market value of total assets (COMPUSTAT item #6- #60- #74 + #25* #199) and liquidation value is calculated as 0.715* accounts receivable (COMPUSTAT item #2) + 0.547* inventory (COMPUSTAT item #3) + 0.535*PPE (COMPUSTAT item #8) + cash (COMPUSTAT item #1);

SP Rate: Transformation of S&P rating, from 1 (AAA) to 22 (D);

STD Ret: The standard deviation of the residuals from the market model using daily returns from the year before the debt issuance, requiring at least 100 observations in the firm-year;

Size: The natural log of sales (COMPUSTAT item #12);

Repay_Rank: The tercile rank of the ratio of long-term debt (COMPUSTAT item #9) plus the offering amount of the bond issuance to total debt (long-term debt COMPUSTAT item #9 + current debt COMPUSTATE item #34)

Accruals: The first principal component of three various absolute values of discretionary accruals (described in Appendix B);

Herf: To construct this index, we calculate Herfindahl index for each loan deal issued by the firm by summing up the squared ownership by each bank, scaled by 10,000. We then define **Herf** as the median of the Herfindahl index of these bank loans issued within 6 years before the issuance of the public debt.

Fin Cov:	The median number of financial covenants of the loans issued within 6 years before the issuance of the public debt.
Maturity:	The natural log of the loan's maturity in months;
Offer Size:	The natural log of offering amount of the debt;
Senior:	Indicator variable equal to 1 if debt is senior, and zero otherwise;
Leverage:	Total debt (COMPUSTAT item #9 + COMPUSTATE item #34) over total assets (COMPUSTAT item #6);
PPE:	Property, plant and equipment (COMPUSTAT item #8) divided by total assets (COMPUSTAT item #6)
CFO:	Cash flow from operation (COMPUSTAT item #308) divided by lagged total assets (COMPUSTAT item #6);
STD PL Ratio:	The standard deviation of **PL Ratio** from the sample period.

To test our fourth and fifth hypotheses, we conduct a second analysis that examines the effect of cross-acceleration provisions on the interest rate spreads charged on public debt using the following OLS model:

$$\textbf{Treasury Spreads} = \beta_0 + \beta_1\text{*Crss\_Accl} + + \beta_2\text{* PL Ratio\_rank} + \beta_3\text{* SP Rate} + \beta_4\text{* STD Ret} + \beta_5\text{*Size } \beta_6\text{*Accruals} + \beta_7\text{*Crss\_Accl* Accruals} + \beta_8\text{* Maturity} + \beta_9\text{* Offer Size} + \beta_{10}\text{* Senior} + \beta_{11}\text{* Leverage} + \beta_{12}\text{* CFO} + \beta_{13}\text{* PPE} + \beta_{14}\text{* Credit Spread} + \beta_{15}\text{* Term Spread} + \varepsilon \quad (2)$$

In Equation (2), **Treasury Spreads** is defined by FISD as the interest charged on the indenture over the interest rates on a T-note with similar maturity.[16] We argue that cross-acceleration provisions allow public debt holders to free ride on banks' monitoring and therefore decrease the cost of debt. However, the interest charge of the public debt can also be higher in the presence of cross-acceleration provisions because banks can shift wealth from bondholders or because these provisions can alter the likelihood that the borrower is liquidated or continued in circumstances where it is not value maximizing. Therefore, we do not have a prediction on **Crss_Accl**. We also expect smaller firms, and firms with a lower CFO, higher return standard deviation, or a worse credit rating to have

[16] We confirmed with Mergent that Treasury Spreads are collected from the press release, for issues without this information on FISD but with offering yield information (i.e., 80 issues in the sample), we manually match offering yield with T-note with similar maturities to calculate treasury spreads.

a higher spread. In addition, we argue firms with more opaque information environment to pay a higher spread (Bharath et al., 2008), so we expect the coefficient on **Accruals** to be positive.

We also expect the effect of **Accruals** on the interest rate to be different in the presence of cross-acceleration covenants. Based on **H5**, we expect the correlation between **Accruals** and interest charge to be larger in the presence of cross-acceleration provisions. Further we include **Offer Size**, **Maturity**, **Senior, Fin Cov, PL Ratio_Rank Credit Spread** and **Term Spread** as control variables, where **Credit Spread** is defined as the difference in yield between AAA and BAA corporate bonds, and **Term Spread** is defined as the difference in yield between 10-year and 2-year T-notes.

Given the likely endogenous determination of the decision to use cross-acceleration provisions and interest rates, we employ a Heckman model to adjust for selection bias. Bradley and Roberts (2004) highlight the importance of adjusting this selection bias and use a similar approach to deal with the endogenous relation between bank debt interest spreads and covenants. Inverse mills ratios calculated from the first stage (i.e., Equation (1)) are then used in Equation (2) to adjust the selection bias. We follow Maddala's (1983) approach to adjust the standard errors due to this two-stage procedure.

5. Sample Selection

To test our hypotheses, we require firms in our sample to have borrowed from the syndicated loan market within six years before they issue public debt. We collect public debt information from the FISD database, and bank loan information from the LPC database. We obtain detailed information on public debt agreements, including the covenants contained in those agreements, from the FISD database over the period from

June 1961 to February 2007. We focus on public debt agreements entered into by U.S. corporations between January 1994 and February 2007 because our analyses require detailed data on the provisions included in the firm's bank loans and bank loan data on the LPC database is only available over this period.

We then merge the data from the FISD database with COMPUSTAT and CRSP and with the LPC Dealscan database of syndicated debt. In merging FISD and COMPUSTAT, we require a minimum of three months between fiscal year end and public debt issuances to ensure debt holders have current financial information. We also require each public debt to be rated by S&P or Moody's (see footnote 13). We acquire ownership information of loan lenders from bank loans within five years before the public debt issuances. In our primary analysis, we include 1,670 public debt issues, of which 1,040 issues include a cross-acceleration provision.[17] Our sample represents 540 firms.[18] Out of the 1,670 issues, 1,060 include the treasury spreads data on the FISD database, which is required for the cost of debt analysis.

6 Results

6.1 Main Analysis

Table 1 provides descriptive statistics for the firms in our sample partitioned by the presence of a cross-acceleration provision in the firm's public debt. 1,040 out of 1,670 (62%) of our public debt sample include this provision. Firms with cross-acceleration provisions are smaller, have a larger returns variance, and have worse credit ratings. This indicates that these firms are riskier, consistent with **H1**. We also find that,

[17] We exclude convertible bonds and private placements contained in the FISD database.

[18] There are 5,910 issues that are neither private placements nor convertible bonds, representing 1,656 firms, after merging with COMPUSTAT. Requiring the firm to have issued bank debt within 6 years before debt with available lender information, there are 2,693 issues (776 firms). Finally, requiring all variables (including stock return volatility) to be non-missing, we end up having 1,670 issues (510 firms).

consistent with **H3**, firms using cross-acceleration provisions have larger absolute value of discretionary accruals. Also consistent with **H3**, firms with cross-acceleration provisions also appear to have a more concentrated group of lenders, with the lead lender holding a relatively larger share of the loan, and more financial covenants in bank loans. This suggests that firms with cross-acceleration provisions, on average, borrow from banks with higher monitoring incentives. In addition, public debt issues that contain this provision tend to be smaller.

Table 2 presents the correlations of the variables in our models. Both **Size** and **SP Rate** appear to be significantly correlated with several variables, although no correlation is greater than 50%. Two of our measures of the quality of monitoring, the **Herf** and **Lead Share**, are 93% correlated, which is desirable since these are two alternative measures of the same construct.

Table 3 presents the results of our tests examining the determinants of the choice to include cross-acceleration provisions in the firm's public debt contract. Consistent with **H1** we find that the use of cross-acceleration provisions decreases with liquidation risk due to cascading defaults, we find a negative coefficient on **PL Ratio_Rank**. This finding suggests that when the borrower's expected going concern value is high relative to its expected liquidation value of assets in place, the public debt contract is less likely to include cross-accelerations out of concerns that an avalanche of accelerations will lead to suboptimal liquidation or bankruptcy. Firms in the top tercile of **PL Ratio** are 17% less likely to include cross-acceleration provisions in public debt agreements than firms in the bottom tercile.[19] Also consistent with our first hypothesis and with the Table 1 univariate

[19] The differential likelihood of using cross-acceleration provisions is based on the marginal effects from the Probit model.

statistics, the results of our Probit analysis indicate that riskier firms are more likely to include cross-acceleration provisions in their debt contracts. In both models, we find that larger firms and firms with better credit ratings are less likely to have cross-acceleration provisions included in the contract. These results are both statistically and economically significant. For example, a one standard deviation increase in **Size** is associated with an 8.7% decrease in the likelihood of including cross-acceleration provisions in public debt contracts.[20]

Consistent with **H2**, we find a positive coefficient on **PL Ratio_Rank* Repay_Rank**, suggesting that while firms with high **PL Ratio** are less likely to use cross-acceleration covenants, later repayment of existing debt reduces the agency conflicts among lenders in the presence of cross-acceleration provision. This finding is consistent with the argument that the existence of a cross-acceleration covenant could reduce the monitor's incentives to demand early repayment when doing so would substantially move forward the repayment of existing debt, thereby reducing the likelihood of borrower liquidation.

To test our third hypothesis, Model 1 and 2 include **Accruals** to measure the bank's ability to monitor and **Lead Share** and **Herf**, respectively, as our measure of incentives to monitor. Consistent with **H3,** we find that the higher the borrower's unexplained accruals the more likely that the issue includes a cross-acceleration provision. This suggests cross-acceleration covenants are more prevalent the more difficult it is to measure the borrowers' performance. This result appears to be

[20] The standard deviation of **Size** is 1.531 and the coefficient of marginal effects is -0.057.

economically significant with a one standard deviation increase in **Accruals** leading to a 4.8% increase in the likelihood of a cross-acceleration provision.[21]

The estimated coefficients on our measures of the lender's monitoring incentives are generally significant in the predicted direction supporting our hypotheses. When the bank loan ownership is more concentrated or when the lead arrangers hold a relatively larger share of the loan, the public debt agreement is more likely to include cross-acceleration provisions. An increase in **Herf** (**Lead_Share**) by one standard deviation is associated with a 6.7% (8.2%) increase in the likelihood of having cross-acceleration provisions in public debt agreements.[22] In sum, the results on **Accruals, Lead Share** and **Herf** suggest that the more beneficial delegated monitoring is, the more likely pubic debts include cross-acceleration provisions.

Our finding that senior public debt is less likely to have cross-acceleration provisions than subordinated public debt is inconsistent with Widen's (2002) argument that senior debt holders should be more likely to have cross-acceleration provisions. The difference may be attributable to senior public debt holders not having superior rights, like banks.

Table 4 reports the results on our second analysis, examining the effect of cross-acceleration provisions on the treasury-spreads of the firm's public debt agreements predicted by **H4**. In the OLS model, we find that cross-acceleration provisions increase interest spreads. In contrast, in the Heckman model, once we have controlled for differences in the type of borrower that includes this provision in their public debt contract, we find interest rates decrease with the existence of cross-acceleration

[21] The standard deviation of **Accruals** is 0.336 and the coefficient of marginal effects is 0.143.

[22] The standard deviations of **Herf** and **Lead_Share** of the overall sample are 0.191 and 20.708, respectively. The coefficients of marginal effects are 0.349 and 0.004, respectively.

provisions. The difference between the two models highlights the importance of controlling for the selection issue, as suggested by Bradley and Roberts (2004).

In addition to this finding, in Table 4 we also find a positive coefficient on **Crss_Accl*Accruals**, which is consistent with **H5** and suggests that accounting information is important to public debt holders because of their reliance on banks' monitoring.[23] Interestingly, for firms without cross-acceleration provisions, accruals do not appear to be related to the cost of debt. This result suggests that, compared to the results in the literature, accounting quality has a more nuanced role in public debt agreements. When public debt holders rely on banks' monitoring that typically has accounting based covenants, borrowers with poor accounting quality are charged a higher rate. In addition, this result suggests that our Accruals measure is not merely capturing risk, since risk should be related to the interest rate on the debtor even in the absence of a cross-acceleration provision. The estimated coefficients on our control variables indicate that interest rates decrease with **Size**, **PPE** and **Senior**, and increase with **STD Ret.** All of these findings are consistent with our predictions.

6.2 Robustness Checks

While loan ownership concentration and lead arrangers' ownership can be a proxy for the quality of private lenders' monitoring of the firm, it is possible that these two variables proxy for an omitted risk variable in the model. That is, our finding that concentrated ownership (or high lead lenders' ownership) is associated with higher likelihood of inclusion of cross-acceleration provisions may be due to omitted variables.

[23] We also test whether the sum of the coefficients on main effect ($\boldsymbol{\beta_2}$) and interactive effect ($\boldsymbol{\beta_3}$) are different from zero. The F-value of this test is 7.67, P-value is 0.0057, suggesting that accruals are priced when Crss_Accl=1.

Consistent with the suggestions of Larcker and Rusticus (2010) we use an instrumental variables approach with theoretically justified instruments to address this endogeneity issue. Besides using loan characteristics (e.g., loan maturity and deal size), we identify two additional theory based instruments.

Consistent with Larcker and Rusticus' (2010) suggestion, we identify our first instrument based on the theory that banks face regulatory lending restrictions that will potentially influence the amount of the loan that they will hold (see Ivashina, 2009). We argue that banks' lending to a particular borrower is constrained by regulatory lending restrictions. In particular, loans to a single borrower cannot exceed 15% of a bank's capital for uncollateralized loans or 25% for its collateralized loans. Following Ivashina (2009), for each lead lender, we rank their lending (in dollar amount) to various borrowers over the three years prior to the bank debt issuance. We then use the 75th percentile of the lending amount in dollars as a proxy for lending restrictions since these restrictions are not observable. Specifically, after we acquire this lending restriction proxy for each bank loan, we measure **$Ownership** as the median of this proxy for the bank loans issued within six years before the public debt is issued. We argue that the **Lead Share** and **Herf** increase with **$Ownership**, as the ownership by lead lenders depends on their capacity to lend to a single borrower.

Our second theory based instrument arises from the introduction of market-flex language in bank loan contracts in 1998 that provided lead lenders with more flexibility when syndicating a loan (S&P, 2009). Specifically, prior to 1998 arrangers would informally polling select investors to gauge their interest and then launch the credit at a spread and fee believed to clear the market. If the loan was undersubscribed, the arrangers could end up holding more of the loans than they would prefer. Market-flex language,as a standard feature of loan commitment letters, .allows arrangers to change the pricing of the loan based on investor demand as well as shift amounts between various tranches of a loan, Therefore, we argue that after 1998, lead lenders' ownership and ownership concentration decrease. The variable **Market Flex** is defined as the median of the indicator variable for whether a bank loan is syndicated after 1998 for bank loans issued within six years before the public debt is issued.

The first stage regression results from the two-stage-least-squares model are presented in Table 5. Most importantly, we find that both **Lead Share** and **Herf** are positively correlated with **$Ownership**, and **Herf** is negatively correlated with **Market Flex**. All of these findings are consistent with our predictions. In addition, **Herf** and **Lead Share** are positively correlated with **STD Ret**. These findings are largely consistent with Sufi's (2007) argument that the syndicated loans of firms with higher information asymmetry tend to have higher debt ownership concentration and higher ownership by lead arrangers. Further, we find **Herf** and **Lead Share** are negatively correlated with bank loan size and maturity. Again, these results are consistent with Sufi's (2007) findings.

The results of the second stage of the 2SLS model are displayed in Table 6. Table 6 shows that the results reported in Table 3 do not seem to be driven by the endogeneity issue. We continue to find that better monitoring quality is positively associated with the likelihood of using cross-acceleration provisions.

Finally, we define the variable **Repay** as 1-(total debt that mature within 3 years divided by total debt plus the offering amount of the new public debt), based on the idea that the average bank loan has a three-year maturity, to capture expected public debt repayments prior to bank loan maturity. We continue to find the same result that the negative relationship between the use of cross-acceleration and going concern vs. liquidation value (i.e., **PL Ratio_Rank**) is dampened by **Repay_Rank**.

In an untabulated analysis, we investigate whether our measure of accounting quality is potentially capturing some correlated omitted variable by developing a measure of non-discretionary accruals, and investigating the relationship between non-discretionary accruals and the use of cross-acceleration provisions. Specifically, we identify the non-discretionary portion of accruals, and re-run the factor analysis on the non-discretionary portion of accruals. Our reasoning behind this test is that if some correlated omitted variable is affecting discretionary accruals, it should also affect non-discretionary accruals. So we then include this measure of non-discretionary accruals in the model, and find that it does not load in our tests. This suggests our accounting quality measure is unlikely to be affected by correlated omitted variables.

7. Conclusion

This paper extends the cross-monitoring literature by providing direct evidence on the determinants and consequences of public debt holders' decision to delegate monitoring to private lenders, such as banks. Previous research considers only the benefit from the cross-monitoring mechanism that all public debt holders obtain because bank monitoring reduces the borrowers' overall credit risk. Our paper suggests that cross-monitoring is not always beneficial to bondholders who delegate monitoring to banks. Our results indicate that cross-monitoring may lead to value-reducing borrower liquidation and may give banks an opportunity to shift wealth from bondholders. In addition, rather than focusing on this implicit cross-monitoring effect, we consider explicit delegated monitoring included in some public debt issues that directly tie their payment schemes to banks' monitoring. Specifically, we examine the covenant that requires accelerated payment when banks decide not to waive technical defaults and instead demand accelerated payments.

Based on the cost-benefit tradeoff, our paper shows that there is cross-sectional variation in the demand for cross monitoring. Specifically, we find that, for borrowers with higher expected going concern value relative to expected liquidation value, public debt issues are less likely to include a cross-acceleration provision. This suggests that cascading defaults are important in the decision to use cross-acceleration provision. We also find this relation is dampened when a larger amount of public debt matures before bank debt is due. In addition, we find that cross-acceleration provisions are more likely to be included in public debt agreements when the borrower has higher inherent risk and the benefits of creditor coordination are greater We also find that when the borrower's performance is more difficult to measure the provision is more likely to be used. We further find that public debt agreements are more likely to include cross-acceleration provisions when borrowers' delegated monitors have greater incentives to provide higher quality monitoring. As a consequence of this provision, we find that public debt issues that include this provision require a lower interest rate spread.

Our paper also contributes to the debt covenant and accounting literatures. First, we highlight the mechanisms public debt holders use to delegate monitoring to banks. We find that not all public debt contracts use cross-acceleration provisions to delegate monitoring to banks. Instead, public debt holders appear to consider the costs and benefits of delegating monitoring to banks. One of the factors that appears to be relatively important in the decision to delegate monitoring is the quality of the borrower's financial reports. Public debt contracts of borrowers with low quality financial reports appear to be more likely to delegate monitoring to banks, and accounting quality appears to affect the spreads offered in public debt contracts for the borrowers that have cross-acceleration provisions. These results also extend the results in Bharath et al. (2008) who find accounting quality affects public debt interest rates *on average*, but does not affect other terms of the public debt contract (like maturity or collateral). It appears that accounting has a relatively more nuanced role in public debt. .

We need to caveat the interpretation of our findings. First, due to data availability, our bank loan variables are measured at loan inception rather than at the public debt issuance date. To the extent that these variables change in the intervening period this will introduce measurement error to these bank loan variables. A related issue arises for the variables measured at public debt issuance, which we assume will stay constant over the life of the debt., For example, we assume that the debt repayment structure will not change through time. Again, this may induce measurement error in our proxies, which we attempt to address by ranking the effected variables.. We In addition, although we use an instrumental variable approach to deal with endogeneity concerns, the usual caveats concerning the validity of the instruments apply.

Appendix A

The following examples are constructed based on Bulow and Shoven (1978) who assume a firm has bank debt and public debt in a two-period game.

In all examples, bank debt is due at the end of the second period and cash on hand exceeds or equals the payment on the bank loan plus the public debt due in the first period, but is less than the combined bank and public debt balance. This assumption is consistent with the borrower violating debt covenants in the bank debt during the first period allowing the bank to demand early repayment. Given these assumptions, the bank demanding early payment in the absence of a cross-acceleration provision will not force borrower liquidation, while the bank demanding early payment in the presence of a cross-acceleration provision will force liquidation. The cases when these assumptions are not met are not considered in this appendix as they are less interesting for our purposes because the cross-acceleration provision will not alter the expected receipts.

We examine how the value of the public debt changes based on differing continuation versus liquidation values, on differing amounts of public debt payments due prior to bank debt repayments, and on differing uncertainty in the expected value of continuation.

All examples assume:

(i) cash holdings (C) equal $405,

(ii) the expected value of future earnings if the firm is continued (P) equals $135,

(iii) the bank debt contractually due at the end of the second period (B) equals $135,

(iv) the total public debt (D) equals $540, and

(v) the absolute value of the uncertainty in future earnings (G) multiplied by the probability of each state (P) equals $100 (e.g., if P is 50% for both good and bad states, then G is $200.)

To examine how the desirability of cross-acceleration provisions varies with continuation versus liquidation, we allow the liquidation value (L) to vary. To examine variation in banks' incentives to require early payment, we allow the amount of the public debt due prior to the bank debt (D_1) to vary. Finally, to examine variation in the value of liquidation induced by cross-acceleration provisions we consider differing uncertainty in the expected value of continuation (P and G). Where observable, we restrict our examples to values that are consistent with the empirical distribution of the data in our sample. Specifically, we use the values reported in table 1 for the PL ratio and for Repay to guide the values for L and for D_1 that we consider in our examples. Since P and G are unobservable, our data cannot guide our choices for these variables.

The formula for calculating the expected receipts for bank and public debt are:

Early Repayment with Liquidation (cross-acceleration)

Bank = $(C+L)*(B/(B+D)$

Public = $(C+L)*(D/(B+D)$

Early Repayment without Liquidation (no cross-acceleration)

Bank = B

Public $=D_1+P_{Up}*\text{Min}((D- D_1),(C- D_1-B+P+G_{Up}))+P_{Down}*\text{Max}(0, (C- D_1-B+P-G_{Down}))$

No Early Repayment

Bank = $P_{UP}*\text{Min}(B,((C- D_1+P+G_{Up})*(B/(B+D- D_1)))$
$+ P_{Down}*\text{Max}(0, (C- D_1+P-G_{Down})*(B/(B+D- D_1))$

Public = $D_1 + P_{UP}\ \text{Min}((D- D_1),((C- D_1+P+G_{Up})*((D- D_1)/(B+D- D_1)))$
$+ P_{Down}*\text{Max}(0, (C- D_1+P-G_{Down})\ )*((D- D_1)/(B+D- D_1)$

Panel A provides an analysis of how cross-acceleration provisions affect payouts to bank debt and public debt as the liquidation value changes, Panel B provides similar analysis as the payment date of the public debt changes. Panel C demonstrates the role of changes in G, the uncertainty in value associated with continuation, which depends on both the value of an "upside" and "downside" outcome and the probabilities of these outcomes. While default risk is not explicitly modeled in Bulow and Shoven (1978) changes in G is the closest measure to default risk in their model.

In Panel A, we observe that when there is no cross-acceleration provision, the bank demanding early repayment will never force liquidation so the bank will always demand early payment. This will result in a shift in expected receipts from the public debt holders to the bank debt holders, but will not change the expected firm value.

When there is a cross-acceleration provision that could result in liquidation, the bank may not always demand early repayment depending on the relative continuation versus liquidation value. At the point where the bank's share of the reduction in firm value from liquidation exceeds the benefit of shifting receipts from the public debt holders, the bank will no longer choose to demand early repayment. The benefit to public debtholders of using cross-acceleration provisions increase with L, which can be seen in the right most column in Panel A.

In Panel B, if the bank demands early repayment resulting in liquidation the expected receipts do not depend on G. The dependence on G of the difference in expected receipts for cross-acceleration versus no cross-acceleration arises from the dependence of receipts of early repayment without liquidation. As long as the upside assets are sufficient to insure that the debt is repaid in full in the up state (i.e. G exceeds D – C), the upside receipts will be equal to the remaining debt balance (i.e. D-$\boldsymbol{D_1}$.) As long as the downside assets exceed zero (i.e. C-G exceeds $\boldsymbol{D_1}$) then the downside receipts will be the C-G- $\boldsymbol{D_1}$. Since $\boldsymbol{D_1}$ appears in both the up and down states, the negative effect of $\boldsymbol{D_1}$ in the second period will offset the positive effect in the first period so the expected payment will not depend on $\boldsymbol{D_1}$. By construction the value of G in the downstate will be -100. Therefore the difference in expected payout will depend on the relative size of the total public debt (D) to the beginning cash balance (C). Since the debt is repaid in full in the up state but is not repaid in the downstate (because C is less than D), the expected receipts will be lower the smaller is $\boldsymbol{P_{UP}}$.

Although the intuition is somewhat more complicated, the finding of a monotonic decline in value of cross-acceleration provisions to public debt holders as the probability of the downside decreases also holds using the liquidation value of 25 from Panel B. With this liquidation value the bank will always chose no early repayment. The public debt receipts with no early repayment will also decline with an increase in the downside probability, but the rate of decline with cross-acceleration is smaller than without, thus preserving the monotonic pattern reported in Panel B.

To demonstrate that the repayment schedule matters in the decision to use cross-acceleration provisions, we argue that if the bank demands early payment the difference in expected receipts for cross-acceleration versus no cross-acceleration does not depend on $\boldsymbol{D_1}$. This is uniformly the case when early payment results in liquidation (in the presence of cross-acceleration provision)since the expected receipts formula does not depend on $\boldsymbol{D_1}$. In addition, for early payment not resulting in liquidation (in the absence of cross-acceleration provision), the expected receipts will not depend on $\boldsymbol{D_1}$ as long as $\boldsymbol{D_1}$ is less than C-G[24] so that the receipts in the down state are greater than zero. This condition is consistent with the empirical repayment distribution in our sample.

When the bank does not demand early repayment, the public debt receipts will depend on $\boldsymbol{D_1}$ since the first order effect of an increase in $\boldsymbol{D_1}$ will be a reduction in second period payments that is only a fraction of the increase in payment in the first period.

The banks decision to require early repayment will depend on both the going concern to liquidation value of the borrower, as well as on the amount of public debt that will be repaid prior to the maturity of the bank debt if early repayment is not required. The examples in Panel C illustrate how the bank's indifference point between early repayment and no early repayment varies with $\boldsymbol{D_1}$ as the liquidation value of the borrower changes. When liquidation is greater than going concern value (e.g. Ex 12 in Panel C), the bank always requires early repayment, and as discussed above, the benefits of using cross-acceleration provisions do not vary with $\boldsymbol{D_1}$. In this scenario, the payoffs to public debtholders are also higher when the bank requires early repayment since the liquidation value is higher. On the other hand (e.g., Ex 1-11), the benefits of using cross-acceleration

[24] Strictly speaking, we should say as long as D_1 is less than C-G+P-B, but since we assume that B and P are equal, we simplify the equation. The other condition that needs to be met is that $D<C-B+P+G$, which is assumed to be satisfied in all examples.

provisions vary with D_1 as PL Ratio increases. In Ex 1-10, if $D-D_1$ is higher than the specified level at a given PL Ratio, then the bank would not require early repayment since banks' interests are diluted when there is a cross-acceleration provision. In this scenario, cross-acceleration provisions align public debtholders and banks' interests, reducing the likelihood of value-decreasing liquidation. On the other hand, if $D-D_1$ is lower than the specified level at a given PL Ratio, banks prefer early repayments that reduce public debtholders' payoffs in the presence of cross-acceleration provisions.

Panel A: Benefits of Cross-acceleration versus No Cross-Acceleration for varying values of L holding constant D_1(Assumes G= 200 and $\boldsymbol{P_{Up}} = \boldsymbol{P_{Down}}$ = 50%)

Ex.		Early repayment No Cross-Acceleration No liquidation	Early repayment Cross-Acceleration Liquidation	No early repayment	Difference Cross-Acceleration versus No Cross-Acceleration
1	L=210; D_1 =150 Bank {Public Debt} (Firm Value)	 135 {373} (540)	 123* {492}* (615)*	 92 {416} (540)	 (12) 119 75
2	L=135; D_1 =150 Bank {Public Debt} (Firm Value)	 135 {373} (540)	 108* {432}* (540)*	 92 {416} (540)	 (27) 59 0
3	L=60; D_1 =150 Bank {Public Debt} (Firm Value)	 135 {373} (540)	 93* {372} (465)	 92 {416}* (540)*	 (42) (1) (75)

*represents the preferred state assuming a cross-acceleration provision

Panel B: Benefits of Cross-acceleration versus No Cross-Acceleration for a mean preserving spread with varying values of P_{Up} ,P_{Down} , and G with an assumption of an expected uncertainty of continuation value of +100 and -100 for varying probabilities of up versus downside outcomes, for example in Ex1, G_{up}=500 and G_{down}=125 (assuming, as in Ex. 2 of Panel A that that L=135 and D_1 = 150).

Ex.		Early repayment No Cross-Acceleration No liquidation	Early repayment Cross-Acceleration Liquidation	No early repayment	Difference Cross-Acceleration versus No Cross-Acceleration
1	P_{Up}=0.2 P_{Down}=0.8 Bank {Public Debt} (Firm Value)	135 {332} (540)	108* {432}* ***(540)***	82 {385} (540)	(27) 100 0
2	P_{Up}=0.4 P_{Down}=0.6 Bank {Public Debt} (Firm Value)	135 {359} (540)	108* {432}* (540)*	89 {406} (540)	(27) 73 0
3	P_{Up}=0.5 P_{Down}=0.5 Bank {Public Debt} (Firm Value)	135 {373} (540)	108* {432}* (540)*	92 {416} (540)	(27) 59 0
4	P_{Up}=0.6 P_{Down}=0.4 Bank {Public Debt} (Firm Value)	135 {386} (540)	108* {432}* (540)*	95 {426} (540)	(27) 46 0

*represents the preferred state assuming a cross-acceleration provision

Panel C: How the bank's indifference point between early repayment and no early repayment varies with $\boldsymbol{D_1}$ as the liquidation value of the borrower changes. (Assumes G= 200 and $\boldsymbol{P_{Up}} = \boldsymbol{P_{Down}}$ = 50%)

Ex.	P/L	Repay	L	$\boldsymbol{D\text{-}D_1}$
1	6.75	0.59	20	317
2	5.40	0.59	25	327
3	4.50	0.62	30	336
4	3.38	0.67	40	360
5	2.70	0.70	50	379
6	2.25	0.75	60	404
7	1.92	0.80	70	430
8	1.69	0.85	80	460
9	1.50	0.91	90	493
10	1.35	0.98	100	531
11	1.00	1.00	135	540
12	0.50	1.00	270	540

*represents the preferred state assuming a cross-acceleration provision

APPENDIX B
Construction of the variable *Accruals*

ABACC1: the absolute value of current discretionary accruals calculated based on Teoh et al. (1998). The model is estimated annually for each Fama/French (1997) industry group and each industry-year regression requires at least 20 observations. Based on Teoh et al. (1998) we first estimate the following regression to get the estimated coefficients (variables are defined below).

$$\frac{Current\_Accc}{LagTA} = \gamma_1 \frac{1}{LagTA} + \gamma_2 \frac{\Delta \mathrm{Re}v}{LagTA} + \eta$$

The second step calculates the absolute value of discretionary accruals as:

$$\left| \frac{Current\_Acc}{LagTA} - \hat{\gamma}_1 \frac{1}{LagTA} - \hat{\gamma}_2 \frac{(\Delta \mathrm{Re}v - \Delta AR)}{LagTA} \right|$$

ABACC2: the absolute value of total discretionary accruals calculated based on Dechow et al. (1995). The model is estimated annually for each Fama/French (1997) industry group and each industry-year regression requires at least 20 observations. We first estimate the following regression to get the estimated coefficients (variables are defined below).

$$\frac{Total\_Acc}{LagTA} = \alpha_1 \frac{1}{LagTA} + \alpha_2 \frac{\Delta \mathrm{Re}v}{LagTA} + \alpha_3 \frac{PPE}{LagTA} + \varepsilon$$

The second step calculates the absolute value of discretionary accruals as:

$$\left| \frac{Total\_Acc}{LagTA} - \hat{\alpha}_1 \frac{1}{LagTA} - \hat{\alpha}_2 \frac{(\Delta \mathrm{Re}v - \Delta AR)}{LagTA} - \hat{\alpha}_3 \frac{PPE}{LagTA} \right|$$

ABACC3: the absolute value of total current accruals calculated based on Dechow and Dichev (2002). The model is estimated annually for each Fama/French (1997) industry group and each industry-year regression requires at least 20 observations. ABACC3 is the absolute value of the estimated residual from the following model.

$$\frac{Current\_Acc}{LagTA} = \theta_0 + \theta_1 \left(\frac{CFO}{LagTA}\right)_{t-1} + \theta_2 \left(\frac{CFO}{LagTA}\right)_t + \theta_3 \left(\frac{CFO}{LagTA}\right)_{t+1} + v$$

where

Current_Acc = Earnings before extraordinary items – Cash flow from operating activities – Depreciation (COMPUSTAT #123 – #308 + #14);

Total_Acc = Earnings before extraordinary items – Cash flow from operating activities (COMPUSTAT #123 – #308);

LagTA = Lagged total assets (COMPUSTAT#6);

CFO = Cash flow from operating activities (COMPUSTAT #308);
ΔRev = Change in sales (COMPUTSTAT #12);

ΔAR = Change in accounts receivables (COMPUSTAT #2).

PPE = property, plant and equipment (COMPUSTAT #8).

After the three accruals metrics are measured we then extract the first principal component from the three proxies by industry.

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Table 1
Descriptive statistics by cross-acceleration provision

Variable	Public Debt Does not Contain Cross-Acceleration Provision		Public Debt contains Cross-Acceleration Provision	
	Mean (Median)	Std Dev	Mean (Median)	Std Dev
PL Ratio	4.839 (3.546)	3.559	4.763 (3.355)	4.465
PL Ratio_Rank	1.027 (1.000)	0.859	0.984 (1.000)	0.790
SP Rate	8.008 (8.000)	2.994	10.266*** (10.000)***	3.497
STD Ret	0.020 (0.018)	0.008	0.023*** (0.021)***	0.011
Size	8.904 (9.039)	1.196	7.833*** (7.867)***	1.571
Repay	0.815 (0.882)	0.207	0.879*** (0.951)***	0.192
Repay_Rank	0.767 (1.000)	0.786	1.142*** (1.000)***	0.802
Accruals	-0.325 (-0.366)	0.225	-0.249*** (-0.357)*	0.385
Herf	0.104 (0.069)	0.111	0.187*** (0.097)***	0.220
Lead Share	17.374 (12.500)	14.889	25.465*** (17.000)***	22.983
Fin Cov	1.027 (1.000)	0.948	1.552*** (1.500)***	1.479
Maturity	4.699 (4.796)	0.799	4.700 (4.780)	0.589
Offer Size	19.534 (19.519)	0.761	19.359*** (19.337)***	0.681
Senior	0.976 (1.000)	0.152	0.837*** (1.000)***	0.370
Leverage	0.357 (0.338)	0.167	0.380** (0.361)**	0.201
CFO	0.098 (0.096)	0.070	0.110*** (0.095)	0.091
PPE	0.402 (0.393)	0.254	0.396 (0.417)	0.272
STD PL Ratio	1.063 (0.578)	1.157	2.648** (0.707)***	15.774
Number of Obs.	630		1,040	

Note: ***, ** and * represent 1%, 5% and 10% statistical significance of the differences between the mean (median) for the firms with cross-acceleration and the mean (median) for the firms without cross-acceleration provisions using a T-Test (Wilcoxon Signed rank test).

<u>Variable Definitions:</u>

PL Ratio: Ratio of firm's value of continued operation to liquidation value, where value of continued operation is calculated as market value of total assets (COMPUSTAT item #6- #60- #174+ #25* #199) and liquidation value is calculated as 0.715* accounts receivable (COMPUSTAT item #2) + 0.547* inventory (COMPUSTAT item #3) + 0.535*PPE (COMPUSTAT item #8) + cash (COMPUSTAT item #1);

PL Ratio_Rank: Tercile ranking of **PL Ratio**.

SP Rate: Transformation of S&P rating, from 1 (AAA) to 22 (D);

STD Ret: The standard deviation of the residuals from the market model using daily returns from the year before the debt issuance, requiring at least 100 observations in the firm-year;

Size: the natural log of sales (COMPUSTAT item #12);

Repay: Measured as the ratio of long-term debt (COMPUSTAT item #9) plus the offering amount of the bond issuance to total debt (long term debt COMPUSTAT item #9 + current debt #34) plus the offering amount of the bond;

Repay_Rank: Tercile ranking of **Repay**.

Accruals: The first principal component of three various absolute values of discretionary accruals (described in Appendix B);

Herf: To construct this index, we calculate Herfindahl index for each loan deal issued by the firm by summing up the squared ownership by each bank, scaled by 10,000. We then define **Herf** as the median of the Herfindahl index of these bank loans issued within 6 years before the issuance of the public debt;

Lead Share: The median percentage of the loan held by the lead arrangers' for all of the bank loans issued within 6 years before the issuance of the public debt;

Fin Cov: The median number of financial covenants of the loans issued within 6 years before the issuance of the public debt;

Maturity: The natural log of the loan's maturity in months;

Offer Size: The natural log of offering amount of the debt;

Senior: Indicator variable equal to 1 if debt is senior, and zero otherwise;

Leverage: Total debt (COMPUSTAT item #9 + #34) over total assets (COMPUSTAT item #6);

CFO: Cash from operation (COMPUSTAT item #308) divided by lagged total assets (COMPUSTAT item #6);

PPE: Property, plant and equipment (COMPUSTAT item #8) divided by total assets (COMPUSTAT item #6);

STD PL Ratio: The standard deviation of **PL Ratio** from the sample period.

Table 2
Pearson correlation analysis (p-values in the parentheses)

	PL Ratio	SP Rate	STD Ret	Size	Repay	Accrual	Herf	Lead Share	Fin Cov	Mat	Offer Size	Senior	Leverage	CFO	PPE	STD PL
Crss_Accl	-0.009 (0.718)	0.312 (0.001)	0.149 (0.001)	-0.339 (0.001)	0.162 (0.001)	0.111 (0.001)	0.210 (0.001)	0.191 (0.001)	0.218 (0.001)	0.005 (0.849)	-0.117 (0.001)	-0.216 (0.001)	0.053 (0.032)	0.065 (0.008)	-0.010 (0.676)	0.062 (0.012)
PL Ratio		-0.189 (0.001)	-0.099 (0.001)	-0.010 (0.001)	0.077 (0.002)	-0.117 (0.001)	-0.044 (0.074)	-0.039 (0.113)	0.095 (0.001)	-0.009 (0.717)	0.004 (0.885)	0.071 (0.004)	-0.079 (0.001)	0.189 (0.001)	-0.327 (0.001)	0.419 (0.001)
SP Rate			0.462 (0.001)	-0.619 (0.001)	0.409 (0.001)	0.175 (0.001)	0.343 (0.001)	0.305 (0.001)	0.428 (0.001)	-0.078 (0.002)	-0.215 (0.001)	-0.490 (0.001)	0.302 (0.001)	-0.087 (0.001)	0.214 (0.001)	-0.003 (0.905)
STD Ret				-0.288 (0.001)	0.063 (0.011)	0.240 (0.001)	0.314 (0.001)	0.278 (0.001)	0.183 (0.001)	-0.137 (0.001)	-0.086 (0.001)	-0.185 (0.001)	0.237 (0.001)	-0.028 (0.256)	0.041 (0.098)	-0.063 (0.009)
Size					-0.328 (0.001)	-0.088 (0.001)	-0.399 (0.001)	-0.363 (0.001)	-0.354 (0.001)	-0.017 (0.499)	0.461 (0.001)	0.389 (0.001)	-0.203 (0.001)	-0.088 (0.001)	-0.138 (0.001)	-0.135 (0.001)
Repay						-0.043 (0.079)	0.097 (0.001)	0.037 (0.130)	0.277 (0.001)	0.130 (0.001)	-0.040 (0.098)	-0.160 (0.001)	-0.206 (0.001)	0.265 (0.001)	0.383 (0.001)	0.061 (0.012)
Accruals							0.171 (0.001)	0.155 (0.001)	-0.020 (0.409)	-0.016 (0.516)	-0.061 (0.012)	-0.001 (0.990)	0.119 (0.001)	-0.089 (0.001)	-0.005 (0.852)	-0.051 (0.036)
Herf								0.926 (0.001)	0.013 (0.599)	-0.059 (0.015)	-0.250 (0.001)	-0.225 (0.001)	0.089 (0.001)	-0.009 (0.688)	-0.054 (0.027)	-0.017 (0.480)
Lead Share									0.045 (0.063)	-0.084 (0.001)	-0.218 (0.001)	-0.207 (0.001)	0.108 (0.001)	-0.020 (0.412)	-0.091 (0.001)	-0.07 (0.790)
Fin Cov										-0.018 (0.465)	-0.094 (0.001)	-0.229 (0.001)	0.049 (0.046)	0.007 (0.762)	-0.017 (0.483)	0.173 (0.001)
Maturity											-0.084 (0.001)	-0.035 (0.156)	-0.112 (0.001)	0.064 (0.009)	0.095 (0.001)	0.002 (0.939)
Offer Size												0.134 (0.001)	-0.101 (0.001)	0.081 (0.001)	-0.002 (0.921)	-0.064 (0.009)
Senior													-0.112 (0.001)	-0.040 (0.106)	-0.056 (0.021)	0.027 (0.271)
Leverage														-0.214 (0.001)	0.034 (0.165)	-0.067 (0.006)
CFO															0.363 (0.001)	0.011 (0.661)
PPE																-0.139 (0.001)

Variable Definitions:

PL Ratio: Ratio of firm's value of continued operation to liquidation value, where value of continued operation is calculated as market value of total assets (COMPUSTAT item #6- #60- #174+ #25* #199) and liquidation value is calculated as 0.715* accounts receivable (COMPUSTAT item #2) + 0.547* inventory (COMPUSTAT item #3) + 0.535*PPE (COMPUSTAT item #8) + cash (COMPUSTAT item #1);

SP Rate: Transformation of S&P rating, from 1 (AAA) to 22 (D);

STD Ret: The standard deviation of the residuals from the market model using daily returns from the year before the debt issuance, requiring at least 100 observations in the firm-year;

Size: the natural log of sales (COMPUSTAT item #12);

Repay: Measured as the ratio of long-term debt (COMPUSTAT item #9) plus the offering amount of the bond issuance to total debt (long term debt COMPUSTAT item #9 + current debt #34) plus the offering amount of the bond;

Accruals: The first principal component of three various absolute values of discretionary accruals (described in Appendix B);

Herf: To construct this index, we calculate Herfindahl index for each loan deal issued by the firm by summing up the squared ownership by each bank, scaled by 10,000. We then define **Herf** as the median of the Herfindahl index of these bank loans issued within 6 years before the issuance of the public debt;

Lead Share: The median percentage of the loan held by the lead arrangers' for all of the bank loans issued within 6 years before the issuance of the public debt;

Fin Cov: The median number of financial covenants of the loans issued within 6 years before the issuance of the public debt;

Maturity: The natural log of the loan's maturity in months;

Offer Size: The natural log of offering amount of the debt;

Senior: Indicator variable equal to 1 if debt is senior, and zero otherwise;

Leverage: Total debt (COMPUSTAT item #9 + #34) over total assets (COMPUSTAT item #6);

CFO: Cash from operation (COMPUSTAT item #308) divided by lagged total assets (COMPUSTAT item #6);

PPE: Property, plant and equipment (COMPUSTAT item #8) divided by total assets (COMPUSTAT item #6);

STD PL Ratio: The standard deviation of **PL Ratio** from the sample period.

Table 3
Determinants of the use of cross-acceleration provisions in public debt agreements

Variable		Model 1	Model 2
	Pred Sign	Coefficient (Z-Stat)	Coefficient (Z-Stat)
Intercept	?	0.352 (0.24)	0.533 (0.36)
PL Ratio_Rank	-	-0.236 (-2.02)**	-0.231 (-2.00)**
SP Rate	+	0.056 (1.41)*	0.060 (1.51)*
STD Ret	+	-0.736 (-0.12)	0.161 (0.03)
Size	-	-0.158 (-2.22)**	-0.165 (-2.28)**
Repay_Rank	?	-0.032 (-0.26)	-0.026 (-0.21)
PL Ratio_Rank * Repay_Rank	+	0.164 (1.68)**	0.167 (1.71)**
Accruals	+	0.393 (2.55)***	0.392 (2.56)***
Herf	+	0.956 (2.39)**	
Lead Share	+		0.006 (1.68)**
Fin Cov	+	0.080 (1.17)	0.065 (0.96)
Maturity	+	0.021 (0.36)	0.022 (0.37)
Offer Size	?	0.061 (0.71)	0.053 (0.61)
Senior	?	-0.431 (-2.03)**	-0.435 (-2.04)**
Leverage	?	-0.227 (-0.60)	-0.259 (-0.68)
CFO	?	2.155 (2.28)**	2.154 (2.29)**
PPE	?	-0.660 (-1.98)**	-0.669 (-1.99)**
STD PL Ratio	?	0.018 (0.41)	0.017 (0.38)
N		1,670	1,670
Pseudo R-Squared		0.1547	0.1523

Note: z-statistics in the parentheses are based on standard errors clustered at the firm level.
***, ** and * represent 1%, 5% and 10% significance, respectively, based on a one- or two-tailed test, as appropriate.

<u>Variable Definitions:</u>

Crss_Accl: Indicator variable for public debt agreement that includes cross-acceleration provisions; zero otherwise;

PL Ratio_Rank: Tercile rank of the ratio of firm's value of continued operation to liquidation value, where value of continued operation is calculated as market value of total assets (COMPUSTAT item #6- #60- #174+ #25* #199) and liquidation value is calculated as 0.715* accounts receivable (COMPUSTAT item #2) + 0.547* inventory (COMPUSTAT item #3) + 0.535*PPE (COMPUSTAT item #8) + cash (COMPUSTAT item #1);

SP Rate: Transformation of S&P rating, from 1 (AAA) to 22 (D);

STD Ret: The standard deviation of the residuals from the market model using daily returns from the year before the debt issuance, requiring at least 100 observations in the firm-year;

Size: the natural log of sales (COMPUSTAT item #12);

Repay_Rank: Tercile rank of the ratio of long-term debt (COMPUSTAT item #9) plus the offering amount of the bond issuance to total debt (long term debt COMPUSTAT item #9 + current debt #34) plus the offering amount of the bond;

Accruals: The first principal component of three various absolute values of discretionary accruals (described in Appendix B);

Herf: To construct this index, we calculate Herfindahl index for each loan deal issued by the firm by summing up the squared ownership by each bank, scaled by 10,000. We then define **Herf** as the median of the Herfindahl index of these bank loans issued within 6 years before the issuance of the public debt;

Lead Share: The median percentage of the loan held by the lead arrangers' for all of the bank loans issued within 6 years before the issuance of the public debt;

Fin Cov: The median number of financial covenants of the loans issued within 6 years before the issuance of the public debt;

Maturity: The natural log of the loan's maturity in months;

Offer Size: The natural log of offering amount of the debt;

Senior: Indicator variable equal to 1 if debt is senior, and zero otherwise;

Leverage: Total debt (COMPUSTAT item #9 + #34) over total assets (COMPUSTAT item #6);

CFO: Cash from operation (COMPUSTAT item #308) divided by lagged total assets (COMPUSTAT item #6);

PPE: Property, plant and equipment (COMPUSTAT item #8) divided by total assets (COMPUSTAT item #6);

STD PL Ratio: The standard deviation of **PL Ratio** from the sample period.

Table 4
Analysis of the effects of cross-acceleration provisions on the treasury spreads (as a spread over interest rates on t-notes of similar maturity) of public debt

Variable		OLS Model	Heckman Model
	Predicted Sign	Coefficient (T-stat)	Coefficient (T-stat)
Intercept	?	-176.743 (-1.64)	-108.732 (-1.22)
Crss_Accl	-	25.656 (2.50)**	-62.431 (-1.99)**
PL Ratio_Rank	?	-5.923 (-1.36)	-9.075 (-2.27)**
SP Rate	+	16.948 (7.84)***	190951 (11.95)***
STD Ret	+	3137.339 (5.32)***	3232.831 (8.80)***
Size	-	-4.657 (-1.38)*	-9.334 (-2.99)***
Accruals	+	-32.972 (-1.47)	-24.517 (-1.50)
Crss_Accl * Accruals	+	53.641 (2.20)**	52.091 (3.12)***
Maturity	?	12.258 (4.26)***	12.381 (3.00)***
Offer Size	?	4.246 (0.89)	5.376 (1.19)
Senior	-	-49.901 (-2.35)**	-53.411 (-4.04)***
Leverage	+	15.948 (0.82)	6.326 (0.37)
CFO	-	-62.065 (-1.18)	5.493 (0.11)
PPE	-	-18.597 (-1.28)	-39.876 (-2.74)***
Credit Spread	?	107.535 (6.82)***	97.713 (5.95)***
Term Spread	?	-27.534 (-6.47)***	-35.185 (-7.63)***
Inverse Mills Ratio	?		54.713 (2.92)***
N		1,060	1,060
R-Squared		0.5106	0.5154

Note: t-statistics in the parentheses are based on standard errors clustered at the firm level, standard errors in the Heckman model is adjusted using Maddala (1983) approach. ***, ** and * represent 1%, 5% and 10% significance, respectively, based on a one- or two-tailed test, as appropriate.

<u>Variable Definitions:</u>

Crss_Accl: Indicator variable for public debt agreement that includes cross-acceleration provisions; zero otherwise;

PL Ratio_Rank: Tercile rank of the ratio of firm's value of continued operation to liquidation value, where value of continued operation is calculated as market value of total assets (COMPUSTAT item #6- #60- #174+ #25* #199) and liquidation value is calculated as 0.715* accounts receivable (COMPUSTAT item #2) + 0.547* inventory (COMPUSTAT item #3) + 0.535*PPE (COMPUSTAT item #8) + cash (COMPUSTAT item #1);

SP Rate: Transformation of S&P rating, from 1 (AAA) to 22 (D);

STD Ret: The standard deviation of the residuals from the market model using daily returns from the year before the debt issuance, requiring at least 100 observations in the firm-year;

Size: the natural log of sales (COMPUSTAT item #12);

Accruals: The first principal component of three various absolute values of discretionary accruals (described in Appendix B);

Fin Cov: The median number of financial covenants of the loans issued within 6 years before the issuance of the public debt;

Maturity: The natural log of the loan's maturity in months;

Offer Size: The natural log of offering amount of the debt;

Senior: Indicator variable equal to 1 if debt is senior, and zero otherwise;

Leverage: Total debt (COMPUSTAT item #9 + #34) over total assets (COMPUSTAT item #6);

CFO: Cash from operation (COMPUSTAT item #308) divided by lagged total assets (COMPUSTAT item #6);

PPE: Property, plant and equipment (COMPUSTAT item #8) divided by total assets (COMPUSTAT item #6);

Credit Spreads: Defined as the difference in yield between AAA and BAA corporate bonds;

Term Spreads: Defined as the difference in yield between 10-year and 2-year T-notes**;**

Inverse Mills Ratio: Calculated from a Probit model similar to Equation (1), where we include ownership Herfindahl of the loan as an instrumental variable.

Table 5
Determinants of bank loan ownership Herfindahl index and lead arranger's ownership as the first stage model for 2SLS estimations

		Model 1 (Herf)	Model 2 (Lead Share)
VARIABLES	Pred Sign	Coefficient (T-Stat)	Coefficient (T-Stat)
Intercept	?	2.056 (10.60)***	202.432 (9.30)***
PL Ratio_Rank	?	0.041 (3.34)***	4.757 (3.62)***
SP Rate	+	0.008 (2.54)***	0.760 (2.34)**
STD Ret	+	1.960 (3.36)***	165.542 (2.37)**
Size	-	0.012 (1.10)	0.659 (0.57)
Repay_Rank	?	0.024 (2.08)**	2.314 (1.70)*
PL Ratio_Rank* Repay_Rank	?	-0.015 (-1.82)*	-1.895 (-2.04)**
Accruals	+	0.022 (1.28)*	2.353 (1.19)
Fin Cov	?	-0.016 (-2.64)***	-1.113 (-1.64)
Maturity (Public Debt)	?	-0.004 (-0.77)	-0.855 (-1.54)
Offer_Size (Public Debt)	?	0.004 (0.54)	0.746 (0.81)
Senior (Public Debt)	?	-0.003 (-0.14)	-0.247 (-0.11)
Leverage	?	0.012 (0.33)	1.553 (0.38)
CFO	-	0.026 (0.35)	6.871 (0.86)
PPE	-	-0.038 (-1.24)	-4.832 (-1.38)*
STD PL Ratio	?	0.000 (0.07)	-0.004 (-0.18)
Maturity (Loan)	-	-0.038 (-3.11)***	-2.293 (-1.65)
Offer_Size (Loan)	-	-0.102 (-9.00)***	-10.146 (-8.32)***
$Ownership	+	0.001 (1.35)*	0.035 (1.75)**
Market Flex	-	-0.046 (-2.71)***	-1.120 (-0.64)

N		1,613	1,613
Adj. R-squared		0.5409	0.4479

Note: t-statistics in the parentheses are based on standard errors clustered at the firm level.
***, ** and * represent 1%, 5% and 10% significance, respectively, based on a one- or two-tailed test, as appropriate.

<u>Variable Definitions:</u>

Crss_Accl: Indicator variable for public debt agreement that includes cross-acceleration provisions; zero otherwise;

PL Ratio_Rank: Tercile ranking of **PL Ratio**, where **PL Ratio** is defined as the ratio of firm's value of continued operation to liquidation value, where value of continued operation is calculated as market value of total assets (COMPUSTAT item #6- #60- #174+ #25* #199) and liquidation value is calculated as 0.715* accounts receivable (COMPUSTAT item #2) + 0.547* inventory (COMPUSTAT item #3) + 0.535*PPE (COMPUSTAT item #8) + cash (COMPUSTAT item #1);

Repay_Rank: Tercile ranking of **Repay**, where **Repay** is measured as the ratio of long-term debt (COMPUSTAT item #9) plus the offering amount of the bond issuance to total debt (COMPUSTAT item #9 + #34) plus the offering amount of the bond;

SP Rate: Transformation of S&P rating, from 1 (AAA) to 22 (D);

STD Ret: The standard deviation of the residuals from the market model using daily returns from the year before the debt issuance, requiring at least 100 observations in the firm-year;

Size: the natural log of sales (COMPUSTAT item #12);

Accruals: The first principal component of three various absolute values of discretionary accruals (described in Appendix B);

Herf: To construct this index, we calculate Herfindahl index for each loan deal issued by the firm by summing up the squared ownership by each bank, scaled by 10,000. We then define **Herf** as the median of the Herfindahl index of these bank loans issued within 6 years before the issuance of the public debt.

Lead Share: The median percentage of the loan held by the lead arrangers' for all of the bank loans issued within 6 years before the issuance of the public debt;

Fin Cov: The median number of financial covenants of the loans issued within 6 years before the issuance of the public debt;

Maturity: The natural log of the loan's maturity in months;

Offer Size: The natural log of offering amount of the debt;

Senior: Indicator variable equal to 1 if debt is senior, and zero otherwise;

Leverage: Total debt (long term debt COMPUSTAT item #9 + current debt #34) over total assets (COMPUSTAT item #6);

CFO: Cash from operation (COMPUSTAT item #308) divided by lagged total assets (COMPUSTAT item #6);

PPE: Property, plant and equipment (COMPUSTAT item #8) divided by total assets (COMPUSTAT item #6);

STD PL Ratio: Standard deviation of **PL Ratio** over the sample period;

$Ownership: For each loan, the lending limit is measured as the 75^{th} percentile of the dollar size of the lead bank's share, calculated over the three years prior to the issuance date of that bank loan. We then define **$Ownership** as the median of the bank loans issued within 6 years before the issuance of the public debt.

Market Flex: Measured as the median of the indicator variable for *bank loan issued after 1998* of the bank loans issued within 6 years before the issuance of the public debt.

Table 6
Determinants of the use of cross-acceleration provisions in public debt agreements, with a 2SLS adjustment

Variable		Model 1	Model 2
	Pred Sign	Coefficient (Z-Stat)	Coefficient (Z-Stat)
Intercept	?	-0.291 (-0.20)	-0.118 (-0.08)
PL Ratio_Rank	-	-0.263 (-1.94)**	-0.275 (-1.99)**
SP Rate	+	0.050 (1.31)*	0.050 (1.34)*
STD Ret	+	-5.053 (-0.81)	-3.799 (-0.62)
Size	-	-0.110 (-1.45)*	-0.109 (-1.39)*
Repay_Rank	?	-0.275 (-0.21)	-0.025 (-0.19)
PL Ratio_Rank* Repay_Rank	+	0.170 (1.73)**	0.181 (1.83)**
Accruals	+	0.319 (2.04)**	0.316 (2.02)**
Pre_Herf	+	2.062 (2.43)**	
Pre_Lead Share	+		0.019 (2.14)**
Fin Cov	+	0.120 (1.71)**	0.098 (1.44)*
Maturity	+	0.036 (0.59)	0.046 (0.74)
Offer Size	?	0.061 (0.71)	0.044 (0.52)
Senior	+	-0.375 (-1.79)*	-0.383 (-1.82)*
Leverage	?	-0.274 (-0.57)	-0.286 (-0.59)
CFO	?	2.331 (2.50)**	2.263 (2.45)**
PPE	?	-0.550 (1.59)	-0.537 (-1.54)
STD PL Ratio	?	0.026 (0.60)	0.024 (0.56)
N		1,613	1,613
Pseudo R- Squared		0.1684	0.1657

Note: z-statistics in the parentheses are based on standard errors clustered at the firm level.
***, ** and * represent 1%, 5% and 10% significance, respectively, based on a one- or two-tailed test, as appropriate.

Variable Definitions:

Crss_Accl: Indicator variable for public debt agreement that includes cross-acceleration provisions; zero otherwise;

PL Ratio_Rank: Tercile rank of the ratio of firm's value of continued operation to liquidation value, where value of continued operation is calculated as market value of total assets (COMPUSTAT item #6- #60- #174+ #25* #199) and liquidation value is calculated as 0.715* accounts receivable (COMPUSTAT item #2) + 0.547* inventory (COMPUSTAT item #3) + 0.535*PPE (COMPUSTAT item #8) + cash (COMPUSTAT item #1);

SP Rate: Transformation of S&P rating, from 1 (AAA) to 22 (D);

STD Ret: The standard deviation of the residuals from the market model using daily returns from the year before the debt issuance, requiring at least 100 observations in the firm-year;

Size: the natural log of sales (COMPUSTAT item #12);

Repay_Rank: Tercile rank of the ratio of long-term debt (COMPUSTAT item #9) plus the offering amount of the bond issuance to total debt (long term debt COMPUSTAT item #9 + current debt #34) plus the offering amount of the bond;

Accruals: The first principal component of three various absolute values of discretionary accruals (described in Appendix B);

Pre_Lead Share: Predicted value of lead arrangers' ownership from the two-stage-least-squared model.

Pre_Herf: Predicted value of the **Herf** from the two-stage-least-squared model.

Fin Cov: The median number of financial covenants of the loans issued within 6 years before the issuance of the public debt;

Maturity: The natural log of the loan's maturity in months;

Offer Size: The natural log of offering amount of the debt;

Senior: Indicator variable equal to 1 if debt is senior, and zero otherwise;

Leverage: Total debt (COMPUSTAT item #9 + #34) over total assets (COMPUSTAT item #6);

CFO: Cash from operation (COMPUSTAT item #308) divided by lagged total assets (COMPUSTAT item #6);

PPE: Property, plant and equipment (COMPUSTAT item #8) divided by total assets (COMPUSTAT item #6);

STD PL Ratio: The standard deviation of **PL Ratio** from the sample period.