The Role of Secured Debt in the Determination of Leverage, Debt Maturity, and Covenants

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Abstract

An important finding from the corporate finance literature is that key elements of a firm's financial policy are jointly determined. However, it is currently unknown how significant levels of secured debt affect these policies. For example, how does the presence of asset-level covenants (mortgages) affect firm-level covenants (bonds)? To investigate this issue, this study utilizes a sample of public bond-issuing firms from the REIT industry (where secured debt represents over 50% of total debt on average). We document that the covenant structure of public bond issues within the REIT industry is diverse and uniquely adapted to REITs. We then utilize a four equation nonlinear GMM model to simultaneously estimate the effects of secured debt, leverage, debt maturity, and bond covenants. In contrast with prior findings, we find a positive relationship between bond covenants and leverage, which is attenuated by the presence of high growth opportunities. We also find that secured debt acts as a substitute for covenant protection for high growth firms, but acts as a substitute for short-term debt for low growth firms. Furthermore, we document the impact of the financial crisis on the aforementioned financial policies.

Keywords: capital structure, secured debt, leverage, debt maturity, covenants, bonds, REITs

JEL Codes: G32, G01, R33

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Introduction

Agency cost of debt, resulting from the conflict between equity holders and debt holders, is an important factor in the determination of financial policy. Early papers by Jensen and Meckling (1976), Myers (1977), and Smith and Warner (1979), dedicate their focus to explaining these conflicts, such as underinvestment and asset substitution, and to presenting possible solutions including the use of short-term debt, debt covenants, and issuing secured debt. Financial policy decisions regarding debt include not only how much debt to incur (leverage) but also what mechanisms to employ to alleviate the conflicts caused by debt (short-term debt, covenants, secured debt). The cost of these conflicts to the debt holders and the cost of the potential solutions to these conflicts to the equity holders all contribute to the overall agency cost of debt. In an effort to minimize agency costs, firms attempt to strike a balance between the use of leverage and the imposition of restrictions on the firm. As a result of this balance, financial policy variables are inherently interrelated.

As a result of this interrelatedness, an important finding from the corporate finance literature is that financial policy decisions regarding leverage, debt maturity, and covenant structure are jointly determined (Billett et. al., 2007). This previous literature has focused broadly[1], across multiple industries, and has found that the balancing of financial policy variables leads to simultaneous decisions with regard to financial policy. This literature does not, however, include an analysis of the role of secured debt on these relationships. If a firm caries a significant level of secured debt, this could dramatically affect the

[1] Billett et. al. (2007) specifically excludes all financial firms, which would also exclude Real Estate

relationships among key financial policy variables. For example, if a firm issues a significant level of debt secured by it's assets, the debt holder of this obligation will be given a higher priority claim on the pledged assets that could limit future borrowing by the firm, particularly in the public bond market. Furthermore, if there is a threat of future issuance of secured debt, debt holders may impose covenants that restrict the amount of secured debt a firm can issue.

Given the potential influence of secured debt on financial policy decisions, our study will explore how secured debt impacts financial policy. In order to properly examine the role of secured debt we will explore an industry[2] where secured debt use is prevalent, the equity Real Estate Investment Trust (REIT) industry. Equity REITs issue more than 50% of their entire debt structure in the form of secured debt[3]. Therefore, the primary goal of our study will be to utilize this industry to examine what effect secured debt, when present at significant levels, has on the jointly determined financial policies of leverage, short-term debt, and covenant usage. Similar to previous research (Barclay and Smith 1998; Barclay et. al. 2003; Billett et. al. 2007; Johnson, 2003; Kahan and Yermack, 1998; Nash et. al., 2003), we will control for the presence of growth options. Since high growth firms are most influenced by the agency costs of debt, both in terms of equity vs. debt holder conflicts and in the costs of financial restrictions on the firm, controlling for growth options will be crucial to our analysis.

[2] MacKay and Phillips (2005) provide evidence that studying capital structure by industry may be most appropriate, suggesting more research into capital structure focused at the industry level would be merited.
[3] Summary statistics from Table 5 show 51% of all debt in our sample of 104 bond-issuing equity REITs from 1993-2013 is secured debt. Secured debt among all equity REITs not issuing bonds during this same time period is 65%.

A secondary goal for our analysis will be to examine the composition of covenants used by REITs in their pubic bond issues, as such an analysis has never been completed for REITs. This issue is important because REITs may exhibit different covenant protections due to the specific environment of their industry, so understanding what types of covenant protection exist will be important to the interpretation of the relationships between the other financial policy variables and covenant use. Specifically, there are suggestions in previous literature that REIT bonds include a standardized package of bond covenants related to leverage restrictions, and that these covenants provide a uniform influence across all REIT bond issues[4].

Besides bond covenant structure, our analysis will also consider two other REIT specific attributes[5]. First, REITs are required to payout 90% of their taxable income in the form of a dividend in order to maintain REIT tax status, and second, REITs predominantly own income producing commercial real estate. The former attribute forces cash poor REITs to enter the capital markets more frequently, while the latter provides REITs with transparent and highly redeployable assets against which to borrow capital. A need to frequently access the capital market, has the potential to reduce a firm's financial flexibility, while high quality and redeployable assets allow for access to additional debt in the form of secured mortgage debt which may help reduce this lost financial flexibility through an increase in available debt capacity. A recent working paper by Riddiough and Steiner (2016) explores

[4] Riddiough and Steiner (2016) suggest that standard bond covenants limit leverage for REITs causing leverage to be decreasing in unsecured debt. Oazabal and Arora (2012) suggest that a standardized REIT covenant package exists for investment grade REIT bond offerings, with leverage based restrictions similar to requirements imposed by insurance companies when they invest in commercial real estate loans.

[5] See Feng et. al. (2008) for a complete discussion on the uniqueness of REITs.

these issues in more depth.

To begin our analysis, we first construct our sample by collecting all available data on public bond issues by REITs, including relevant bond covenant restrictions, from the Mergent Fixed Incomes Security Database (FISD). We then match this data on a firm-year basis with the Compustat annual financial database (including information on leverage, debt maturity, secured debt levels, growth options, and firm-level control variables) for years 1993-2013. We use the resulting sample to model a system of simultaneous equations consisting of the four jointly determined financial policy variables: leverage, short-term debt, covenant restrictions, and secured debt. Establishing one equation for each of the four variables, we utilize non-linear system Generalized Method of Moments (GMM) to evaluate the effect of each of these policy variables on one another. GMM allows us to control for the endogeneity in our model caused by the joint determination of our financial policy variables. To control for growth options we utilize interaction variables between the financial policy variables and growth options[6]. We refine this analysis further by partitioning the sample in half, into above median and below median growth options, and repeat the above analysis on each sample separately without the interaction variables. Finally, we also account for the effect of the financial crisis on our results.

From the above analysis, we discover some unique financial policy relationships regarding leverage. Unlike the previous corporate finance literature[7], leverage is increasing in the use of bond covenants. This effect however is diminished for high growth option firms that issue bond

[6] Use of non-linear GMM including endogenous interaction variables is consistent with Billett et. al. (2007).
[7] Billett et. al. (2007) finds leverage is decreasing in covenants, but that the negative effect of growth options on leverage is attenuated by covenant use for high growth firms only.

covenants. High growth option firms face greater concern over the loss of future financial flexibility due to covenant restrictions, and this concern makes them less likely, as opposed to lower growth option firms, to deplete debt capacity through higher leverage, even if covenant protections in their bond issues incentivize bondholders to allow it.

We also document several interesting relationships related to secured debt. Our results suggest that secured debt and leverage are complementary in nature with both providing a positive effect on the other[8]. Additionally, we find that secured debt is more attractive to high growth firms, as secured debt is increasing in firm growth options. Furthermore, we observe that secured debt substitutes for covenant protection in high growth firms, while secured debt substitutes for short-term debt in low growth firms. We believe this relationship is related to the higher observed leverage among low growth firms. Higher leverage reduces a firm's access (due to lower credit ratings) to the investment grade public debt market, where bond covenant usage is most prevalent[9], therefore covenant protection is not influential without access to this market.

Examining the covenant structure for REITs, we make the following observations. First, we observe that the covenant structure of REITs is uniquely adapted as compared to non-financial firms, with several covenants, particularly those restricting payouts, sparsely represented within the REIT sample. However, there is a good diversity of covenant representation, with several of the investment and financing type restrictions, common in

[8] This is consistent with the Riddiough and Steiner (2016) result that leverage is decreasing in unsecured debt.
[9] Deng et. al. (2016) demonstrates that investment grade firms issue debt with more covenants than below investment grade firms in the syndicated loan market. This result is also consistent with observations in our sample of public bond-issuing REITs

non-financial firms, also included commonly in REIT bond issues. Examining leverage restrictions specifically, we do not find convincing evidence of a standard REIT covenant package within our full sample. We do observe leverage restrictions in more than half of all investment grade bond issues and find their use has increased in recent years, however below investment grade bond issues exhibit leverage restrictions very infrequently. Based on this evidence we find that while REITs do exhibit a high occurrence of leverage related restrictions in a specific subset of issuances, the influences of covenant structure are much more complex than that single influence, and should be modeled in a way that accounts for this diversity.

The remainder of our analysis will be presented as follows. The first section will explore the hypotheses we intend to test related to leverage, maturity, covenant restrictions, secured debt, and growth options. The second section will define and explore the data used in this paper including examining the covenant structure of public REIT bonds. The third section will present our main findings. The final section will conclude.

Testable Hypotheses

Due to a balancing of the agency costs of debt, we must explore financial policy decisions in a manner that will address both the costs of increased leverage and the possible restrictions on future debt issuances including short-term debt, covenant restrictions, and secured debt. The previous literature on financial policy has focused on the interrelatedness of policy variables, which we too will explore in detail. The following are five key

hypotheses about jointly determined financial policy decisions within our equity REIT sample that we will test empirically.

Hypothesis 1: Leverage and maturity are substitutes.

Barclay et. al. (2003) provides evidence that leverage and maturity may be substitutes[10], however Johnson (2003), provides evidence that leverage and maturity are complements. As a potential explanation for both, Childs et. al. (2005) argues that the relationship between leverage and maturity will trade off liquidity risk from the issuance of short-term debt against it's potential benefit of reducing equity holder vs. debt holder conflicts. This leads to the result that low quality firms, which face greater liquidity risk, will increase leverage in response to shorter maturity. It is this relationship that is observed in the full sample from Johnson (2003). Johnson (2003) finds evidence of the opposite relationship however, when examining a sub-sample of higher quality firms, those that have a credit rating. This result is also consistent with the explanation from Childs et. al. (2005).

Giambona et. al. (2008), which examines the joint determination of leverage and maturity for REITs, and Billett et. al. (2007), which examines the joint determination of leverage, maturity, and covenants for non-financial firms that issue bonds, both find a substitutive relationship between leverage and maturity. Billett et. al. (2007) argues this is due to the higher quality of their bond-issuing (predominantly rated) firms, while Giambona et al. (2008) argues their result of low liquidity risk is due to the quality of the underlying real

[10] Debt maturity is decreasing in leverage, but leverage is increasing in debt maturity. Barclay et. al. (2003) argue for the former substitutive relationship, and suggest a possible misspecification of the leverage equation is driving the latter result.

estate assets. Given that the majority of our sample is rated (similar to Billett et. al., 2007) and due to the quality of the underlying real estate assets (similar to Giambona et. al., 2008), liquidity risk is unlikely to be a primary concern. Therefore we expect that shorter debt maturity will not increase liquidity risk sufficiently to lead to a corresponding reduction in leverage. We would alternatively expect firms to treat leverage and maturity as substitutes, and increase leverage when shortening maturity.

Hypothesis 2: Covenants will increase leverage.

Billett et. al. (2007) posits that the effect of covenants on leverage is an empirical question. Covenants restrict future financing options, reducing financial flexibility, but also decrease agency costs of debt to the bondholders. Therefore, in the presence of covenants, we expect that bondholders will allow for greater leverage, however the remaining question is whether preserving debt capacity, to maintain financial flexibility, will keep firms from utilizing this leverage.

Billett et. al. (2007) finds a negative relationship between leverage and covenants, but also finds that leverage is increasing in growth options interacted with covenants. Here is one point where analysis of capital structure at the industry level is relevant. For REITs, high growth firms would likely have the most to lose from the use of covenants. Due to the requirement that REITs pay out 90% or more of their taxable income in the form of a dividend, it is likely that high growth firms will have to visit the debt market more frequently in order to fund new investment. Unlike high growth non-financial corporate

firms, which can access extensive retained earnings, REITs are dependent on the capital markets to fund new growth. Therefore, we expect high growth firms to avoid taking on additional leverage when covenants are present in the bond issues, so that they can maintain financial flexibility. However, lower growth firms would have less incentive to maintain financial flexibility and would be more likely to increase leverage in the presence of covenants. Therefore by accounting for the interaction of growth options on covenants, we expect that covenants should have a positive effect on leverage, particularly for lower growth firms. We do not, however, expect this relationship to hold for high growth firms.

Hypothesis 3: Secured debt and bond covenants are substitutes.

Both secured debt and covenants reduced risk for the lender. Secured debt offers collateral, and given the redeployability of real estate assets, offers good protection for the lender. Covenants restrict various financial policies of the borrower and reduce the agency cost of debt to the bondholders. Because covenants in many cases restrict secured debt issuance, we expect the use of these policies to be substitutive in nature. Additionally, as the amount of public bond debt increases[11], the potential to use secured debt to deplete assets available to those public bondholders also increases, raising the likelihood of observing a covenant restriction on secured debt.

[11] Note this also suggests a reduction of secured debt as the entire sample of bond debt in our REIT sample is unsecured.

Hypothesis 4: Secured debt will increase with growth options (market-to-book ratio).

Riddiough and Steiner (2016) suggests that secured debt provides liquidity to REITs which otherwise are required to payout their cash via dividends. They argue that REITs can access needed capital to fund future investment options by increasing secured debt. This liquid resource allows firms additional financial flexibility to fund future investment shocks. Because REITs with the highest growth options are more likely to need access to capital quickly to fund new investment opportunities, we predict that secured debt will be increasing in growth options. As an additional benefit to high growth firms, the liquidity provided by secured debt is not burdened by the same firm-level restrictions via covenant restrictions that may exist in public bonds[12].

Hypothesis 5: Leverage and secured debt are complements.

Riddiough and Steiner (2016) provide empirical evidence that Leverage is decreasing in unsecured debt and relate this negative relationship to the presence of bond covenants restricting such leverage. In additional to this empirical support, we would offer that, independent of the influence of covenant protection, leverage should be increasing in secured debt. Because secured debt offers property as collateral, the debt holder's claim priority in the event of default is increased, allowing for higher leverage use by the borrower.

[12] Riddiough and Steiner (2016) suggest that secured debt holders, who hold mortgage debt, are concerned with the underlying collateral and not focused on firm financial characteristics.

Additionally, running in the opposite direction, secured debt should also be increasing in leverage. Unsecured debt requires access to the public bond market, which is greatly impacted by a firm's credit rating. Because firms with higher leverage also carry a higher risk of default, it is likely that increasing leverage too high will impact a firm's credit rating and reduce access to the bond market, or at minimum make access to public bonds less attractive, increasing secured debt use as an alternative.

Data Analysis

Sample of bond issuing equity REITs

Our industry level analysis of capital structure focuses on equity REITs who issued public debt instruments from 1993-2014. While REITs issued public debt prior to 1993, this date is chosen as it corresponds to the beginning of the modern REIT era.[13] Because of the fundamental differences in equity REITs pre and post 1993, we focus our analysis on the relevant later sample.

To gather data on public debt issuances outstanding by REITs from 1993-2014 we follow Billett et. al. (2007) and gather information from the Mergent Fixed Income Security Database. During the 21 years of our sample, 726 unique public bond issues were outstanding for Equity REITs. Relevant to our study, information on the covenant structure

[13]The Taubman Center IPO, which first utilized the UPREIT structure, precipitated the modern REIT era, and that structure, along with several legislative changes that occurred early on in the era, allowed REITs access to an expanded investor base, and allowed for an active management style which did not exist prior to 1993 (Feng et. al. 2011).

of each issue is documented. Mergent FISD provides information on over 50 possible types of covenants for each issue, but as in previous literature we combine these into 15 relevant categories[14]. It is worth noting that covenant restrictions are only present in 58% of the observed issuances, and that among issues with covenant restrictions, a median value of 4 covenants are observed per bond issue.

Table 1 provides a comparison of the use of covenant categories from Billett et. al (2007) to our study. Billett et. al. (2007) focuses on corporate firms but excludes all financial firms including REITs, therefore it will be interesting to see what differences exist between the non-REIT sample from Billett et. al. (2007) and our sample of REITs. In particular it appears that several covenants are underrepresented in the REIT sample.

As Table 1 demonstrates, our REIT sample includes issues utilizing far fewer covenant restrictions, restricting payouts to equity holders. Because REITs are required to distribute 90% of taxable income in the form of a dividend, a restriction on dividend payouts is unlikely to exist. Such a restriction could actually force REITs to choose between violating a covenant restriction or losing their REIT tax status via reduced dividend payments. Dividend restrictions and related stock repurchase restrictions occur in 6% and 3% of REIT issuances respectively compared to 27% and 22% respectively for the non-REIT sample.

[14] See Billett et. al. (2007) for a discussion of each of these 15 categories which include: 1) dividend restrictions, 2) share repurchase restrictions, 3) funded debt restrictions, 4) subordinated debt restrictions, 5) senior debt restrictions, 6) secured debt (negative pledge) restrictions, 7) total leverage tests, 8) sale leaseback restrictions, 9) stock issuance restrictions, 10) ratings net worth minimums, 11) cross default provisions, 12) poison put provisions, 13) asset sale restrictions, 14) investment restrictions, 15) merger restrictions.

Additionally, Because REITs are required to distribute much of their income in the form of dividends, retained earnings are low, and REITs are forced into the capital markets more frequently than a typical corporate firm. Therefore, a low representation of restrictions on the issuance of new debt or equity, is also unsurprising. Observe the low representation of covenants restricting secured debt (negative pledge) and stock issuance as compared to the non-REIT sample.

Finally, asset sale and leaseback restrictions are also relatively uncommon in the REIT sample. Given that REITs are in the business of owning income producing commercial property, the low incidence of this particular covenant restriction is also unsurprising.

Despite the lower incidence of the above restrictions, there are also many similarities between the two samples. Similar to the non-REIT sample, there is a high incidence of covenants restricting asset sales (49%), mergers (49%), total firm leverage (37%), and defaults within the firm (46%), represented in the REIT sample. Notice particularly that total firm leverage restrictions are common in 37% of all bond issues.

Previous literature has suggested that bond covenants of REIT bond issues consist of a standard package of leverage-based restrictions (Oazabal and Arora, 2012; Riddiough and Steiner, 2016; Deng et. al., 2016). Specifically, Riddiough and Steiner (2016) list out the following restrictions as common occurrences in REIT bond covenants:

1) Total leverage no greater than 60%

2) Secured debt to total assets no greater than 40%

3) EBITDA to interest expense no less than 1.50 times

4) Unencumbered assets to total unsecured debt outstanding no less than 1.50 times.

In comparing the language in the prospectuses for several bond issuances to the covenant identifiers in the Mergent FISD, the above package of restrictions is identified as a restriction on indebtedness. This package of restrictions is further classified into the larger category of total leverage restrictions, following the convention in Billett et. al. (2007) for combining specific covenant types into broader covenant categories.

Since only 37% of issuances, in our sample of bond-issuing REITs, contain the total leverage restrictions, this conflicts directly with claims of a standard set of indebtedness covenants influencing the majority of REITs. If issuances are further divided into two groups, investment grade or below investment grade credit rating at issuance, the majority of investment grade bond issues (58% on average) place covenant restrictions on firm total leverage. Below investment grade issuances, however, infrequently (6% on average) include a total leverage restriction. Looking at Figure 1, you see that the incidence of leverage restrictions being included in bond issues by REITs is consistently higher for investment grade issuances over time, with the gap growing even larger after 2009. In 2013 for example, 80% of investment grade bond issues included a total leverage restriction, compared to non-investment grade issues, which had none. These results tend to support the common inclusion, within investment-grade REIT bond issues, of a restriction on leverage. However, given the common inclusion of other covenant restrictions, the

combined impact of all covenants should be considered.

To further explore the relationship between covenants within a given issue by REITs, Table 2 gives the Pearson correlations between the issuance of each of the 15 covenant types. Notice almost all correlations are positive, with the few negative correlations being of low magnitude and mostly statistically insignificant. Our bond-issue sample has the highest degree of correlation between 4 particular covenants, leverage restrictions, cross default provisions, asset sales clauses, and merger restrictions, with a relatively low correlation among all other covenants. There is some evidence of correlation between dividend restrictions, share repurchase restrictions, subordinated debt restrictions and stock issuance restrictions, however.

Table 3, takes a similar look at the relationship between covenants but instead calculates the conditional probability of observing a specific covenant given that another covenant is present. This analysis reaches the same conclusion regarding the main grouping of covenants. Similarly, it demonstrates strong relationships between the 4 most common bond covenants in our sample. For example, merger restricting covenants and asset sale restricting covenants are almost always present together with a

.99 probability of observing a merger restriction given an asset sale covenant, and a probability of 1 of observing an asset sale covenant if a merger covenant exists. Additionally, notice that the conditional probability of observing either a merger restriction, asset sale restriction, or a cross default provision, given the existence of any of the other 14 covenants is in all cases greater than .6. Leverage limitations are also conditionally highly

likely given the presence of most of the other covenants, with notable exceptions being sale/leaseback restrictions (.47), poison puts (.29), and senior debt restrictions (.00).

The above sample analyses suggest that there are fewer covenant restrictions overall in REIT bonds compared to non-financial corporate bonds due to several covenants being excluded as a result of the industry specific characteristics of REITs. Additionally, it appears that for investment grade REIT bonds there is some evidence that the inclusion of a total leverage restriction is commonplace. However, many of the other common covenant restrictions that exist in non- financial corporate bonds are also present in REIT bonds, and despite a reasonable degree of correlation between specific covenants, there does appear to be variation among the different covenant categories represented in each issue. Therefore, examining covenants at the bond issue level suggests that more influences than just a standardized leverage restriction are present and influencing REIT bond issues, and that controlling for this variation, with a measure of the overall strength of covenant protection, is important when examining REIT capital structure decisions.

Firm-Year Merged Sample of Mergent FISD and Compustat

In order to compare bond covenant restrictions to the use of leverage, short-term debt, and secured debt, we will need to combine our covenant information from Mergent FISD with firm financial data in Compustat. Similar to the Billett et. al. (2007), we track all outstanding bond issues from 1984[15] to the end of 2014 that were issued by the REITs in our sample, and record the relevant covenant restrictions at issuance. We then track these

[15] the first year a REIT in our sample issued a bond recorded in the Mergent FISD.

issue over time using the Mergent FISD historical amount outstanding database. With this information we are able to track the years in which a given bond issue was active.

There are 729 issues that were outstanding from 1993-2014 for the REITs in our sample. These issues are tracked for all years that they are outstanding and then all covenant information is combined at the firm level for each year.

In order to match the existing Mergent FISD covenant data to the firm level financial data in Compustat, we combine all firm-year observations on covenant protections with the relevant data from Compustat, removing any firm-year observations that do not contain the required dependent or independent variables necessary for our analysis. Conditioning on a firm having a public bond issue outstanding in a given firm year, we are able to gather 625 firm-year observations from 1993-2013[16].

Endogenous Financial Policy Variables

Our endogenous financial policy variables are leverage, short-term debt, a covenant index measuring covenant protection strength in all public bond issues outstanding for a given firm, and secured debt. These variables make up the four dependent variables in our system of four simultaneous equations. Leverage, short-term debt, covenant index, and secured debt will also be included as endogenous right hand side variables in the equations for each of the other financial policy variables.

[16] Note that due to utilizing an independent variable that is calculated the year after the year we calculate our dependent variables, it is necessary to restrict the upper bound of our sample to the year 2013.

Leverage is calculated as the ratio of total debt (long term liabilities plus current liabilities) to market value (book value of assets minus book value of equity plus the market value of equity). Consistent with Johnson (2003), and Billett et al. (2007), we calculate short-term debt as the proportion of total debt that matures in 3 years or less [represented as Maturity (≤ 3 years) in our tables][17]. Note that if short-term debt is positively related to leverage in our analysis, the previous literature would identify this relationship as leverage and maturity being substitutes for one another.

Following Billett et. al. (2007), we create a covenant index to represent the combined strength of existing covenant protection for all outstanding bond issues within a given firm-year. This is accomplished by giving each of the 15 covenant categories a value of 1 if a particular covenant is present in any of the outstanding bond issues for a given firm-year, otherwise it is assigned a value of 0. Note that consistent with Billett et. al. (2007), this assumes that a covenant in one bond issue protects all outstanding issues of a given firm. The reasoning for this assumption is that a firm should avoid violating any outstanding covenant, regardless of the issue, in order to avoid any potential lose of control rights over the firm. These 15 covenant values are then added together and divided by 15 to give a value ranging from 0 to 1, with 1 being the most covenant protection available, in the form of all 15 covenant types. In our sample the most covenant types recorded in any one firm year are 11.

[17] The literature is mixed however on how to calculate maturity, As noted by Alcock et. al. (2014), which calculates the choice of maturity as the proportion of debt maturing after 3 years, the choice of how to calculate maturity does not seem to matter empirically.

Examining Figure 2, you can see what the average number of covenants observed, by firm, is from 1993-2013. First, considering the covenant index for all firms (dashed line), notice that it appears that the covenant index has drop in the later time period of the sample from approximately 4 to 2. However, when looking at only firms who issued covenants (solid line) notice that the average number of covenants seems to hover consistently around 4 covenants per firm per year. This demonstrates that the observed drop in covenant protection is due to more firms issuing bond debt without covenants at all. Also observe little effect on average from the financial crisis. This is an observation we will explore more thoroughly in the results section.

Secured debt is the final endogenously chosen variable. Secured debt is measured as the proportion of secured debt to total debt. Riddiough and Steiner (2016), who also focus their analysis on REITs, discuss the issue of unsecured debt[18] and its relationship with leverage and firm value. They suggest that unsecured debt represents publicly issued bonds, the exact debt that is influenced by the covenant index discussed above. However, they do not examine the influence of the variation in covenant strength as we do in our analysis, but do acknowledge that the existence of covenant protection as a whole differentiates public bond debt from secured debt. They identify that, in the case of REITs, secured debt is composed of private, property level debt (mortgages), and that the holders of the private level debt are not concerned about firm level restrictions but rather on the financial strength of the underlying collateral. This is the opposite of the public bond holders who, they explain, require a standard package of leverage restricting covenants at the firm level. These covenants are suggested to deter firms, subject to their restrictions, from using available debt

[18] The inverse of our measure of secured debt

capacity, in an effort to preserve financial flexibility. Given what we observe about the structure of the REIT covenants, we will provide a more nuanced analysis of the effect of covenant strength through the use of a covenant index, on firm financial policy, while also controlling for the influence of private property level secured debt (mortgages).

Exogenous Explanatory Variables

The exogenous explanatory variables for leverage, short-term debt, and covenant restrictions are borrowed from previous literature (Barclay et al, 2003; Johnson, 2003; Billett et. al, 2007). Table 4 gives a formal definition of these variables as well as the already discussed endogenous variables. All capital structure variables are evaluated as a function of growth options (proxied by the firms market-to-book ratio). Leverage will also be explained by profitability, firm size, and volatility. Short-term debt will also be explained by firm size, firm size squared, volatility, earnings growth, asset maturity, and term premium. Covenant strength will be further explained by firm size, volatility, a dummy variable equal 1 if an issue is convertible, and as a proxy for level of bankruptcy risk a version of the Altman Z-score[19].

Secured debt, particularly interpreted as a measure of private debt with property level covenants (mortgages), has limited previous literature from which to borrow explanatory variables. As in the case of the other capital structure variables, growth options will be

[19] Z-Score is equal to: (3.3*pretax income + sales + 1.4*retained earnings + 1.2 * working capital) / total assets. This version of an Altman's z-score drops the effect of market value / book value as this variable is already included as a dependent variable in equations where z-score is found. See Mackie-Mason, Do Taxes Affect Corporate Financing Decisions. Journal of Finance. (1990) and Giacomini et. al. (2015).

utilized as an explanatory variable. Additionally, based on evidence from Giambona et. al (2008) that property types are proxies for liquidation value in REITs, and based on the understanding that secured debt is composed primarily of property level mortgage financing, liquidation value proxied by property type will be used in evaluating secured debt[20]. Therefore, additional exogenous dummy variables based on property type will be included in the secured debt equation. Property type dummy variables are as follows; industrial/office, retail, lodging, healthcare, self-storage facilities, diversified (multiple property types), and unclassified (specialized or unique), with residential being the excluded property type. The dummy variable will be equal to one if the firm is of the specified property type. Property types are mutually exclusive.

Note that consistent with prior literature (Billett et.al., 2007; Johnson, 2003; Alcock et. al., 2014) we calculate all exogenous variables one year prior to the year we calculate our endogenous capital structure variables (leverage, short-term debt, covenant index, and secured debt). This eliminates any issues of endogeneity between the exogenous explanatory variables and the dependent endogenous variables that may exist if analyzed contemporaneously.

Descriptive Statistics

A summary of descriptive statistics for our 625-firm sample of bond issuing firms is presented in Table 5. Noteworthy, with this sample, is the high relative mean leverage ratio

[20] Smith and Warner (1979) suggests secured debt will be higher where liquidity risk is greatest.

of 43%, which although not significantly different than the non-bond issuing sample of REITs, is high relative to typical corporate firms that issue public debt. Billett et. al. (2007) finds a mean leverage ratio of 29%, for example, for all non-financial bond issuing firms. Short-term debt and market-to-book ratio are similar between issuing and non-issuing REITs, but secured debt is significantly lower by a significant magnitude for public bond issuing firms. Lower secured debt is unsurprising given that property level financing is an alternative to public bond issuance, and it has been shown that REITs use public bonds to reconfigure debt by paying off existing debt, which can also have the effect of lowering secured debt (Riddiough and Brown, 2003). Note that in general it is assumed that public debt for REITs is unsecured, and that our sample is consistent with this assumption in that all observed bond issuances are unsecured. Devos et. al. (2016) examines secured debt and finds that covenant protections are greatly reduced in the presence of secured debt, when examining the syndicated loans. Similar to the way that convertible debt reduces the need for covenant protection in Billett et. al. (2007), secured debt likely reduces or eliminates the need for firm level covenant protection in private secured debt. This is consistent with the suggestion of Riddiough and Steiner (2016), that secured debt holders are concerned with the underlying asset and are much less concerned with the financial strength of the firm as a whole.

To understand better the influence of growth options on financial policy decisions, we first look at the descriptive statistics in Table 6. This table splits the sample of 625 bond-issuing REITs into above median and below median growth options. Interestingly, above median growth opportunity firms utilize lower median leverage (36% vs. 47%), less short-term

debt (27% vs. 32%), lower secured debt(38% vs. 57%), and more restrictive covenants (covenant index of .20 vs. .07). In fact many of the other explanatory variables also vary significantly between the two samples. This speaks to the importance of controlling for growth options when examining firm capital structure decisions.

Focusing specifically on the difference between leverage for below vs. above median growth options, one key decision facing REITs, with regards to financial policy, will be the choice whether to finance with public or private debt. Public bonds require a good credit rating to issue at attractive rates, and presumably firms target an investment grade credit rating. Given this information, and understanding that credit ratings are partly a function of total firm leverage, it is likely that many below median growth option firms have limited access to the public bond markets, particularly in the investment grade market with the best rates, because of their higher total firm leverage. We will observe in our results, what effect this might have on the use of the three different mechanisms to reduce agency costs of debt.

Further Table 7, looks at the correlation between growth options and the 4 endogenous capital structure variables and leads to some preliminary observations on the relationships between variables. Leverage and short-term debt [Maturity ($\leq$ 3 years)] are positively and significantly correlated. Suggesting short-term debt may be used to reduce the over and under investment problems of Myers (1977) and Jensen and Meckling (1976) . Leverage and growth are negatively and significantly correlated while growth opportunities and covenants are positively correlated, suggesting that growth options reduce the use of

leverage but increase the use of covenants. Note that for the non-financial firm sample utilized in Billett et. al (2007), that growth options were negatively correlated with the covenant index suggesting a potential difference in the characteristics of the two samples. Secured debt is negatively correlated with growth options but positively related to leverage, suggesting that secured debt increases leverage, but also that high growth firms utilize less secured debt. The later correlation is contrary to our Hypothesis 4, and suggests that if our hypothesis is correct, controlling for the endogenous relationship among financial policy variables is important. Finally it is interesting that despite the additional financial constraints imposed by the use of covenants, that leverage has no significant relationship to the use of bond covenants. A more rigorous analysis of the relationships between these variables, controlling for the endogenous relationships among them, will follow next.

Results

Consistent with prior literature, we solve a system of simultaneous equations representing each of the capital structure variables in question. As in Billett et. al. (2007), to control for endogeneity, we utilize a nonlinear Generalized Method of Moments (GMM) estimator with all exogenous variables from the system of equations acting as instruments to the moment conditions for the endogenous variables. GMM estimation is appropriate for this analysis because GMM is consistent with the results from other IV techniques such as 2SLS but is robust to heteroskedasticity of the error term (Greene, 2012). Additionally, as pointed out by Billett et. al. (2007), because we too will utilize a specification with nonlinear endogenous variables, that the use of a non-linear GMM estimator would be better suited

than a linear IV model such as 2SLS. Note that we interact short-term debt with growth options in the leverage equation and covenant index with growth options for the leverage, short-term debt, and secured debt equations. These growth option interaction variables are therefore treated as endogenous variables themselves in the interaction variable models that follow (Greene, 2012).

Joint Determination of Capital Structure with Growth Options Interaction Variables

Identifying that financial flexibility will be a key motivation in capital structure decisions for our sample, it will be important to control for growth options in our analysis beyond controlling for the linear relationship between the financial policy variables and growth options. A high degree of growth options within the firm will likely lead to a greater desire to maintain financial flexibility, and therefore it will be important to model this effect. Johnson (2003) incorporates growth options by interacting the market-to-book ratio with short-term debt in the leverage equation to test whether high growth options attenuate liquidity risk. Billett et.al. (2007) further incorporate growth options into their analysis by including interactions between the covenant index and the market-to-book ratio in both the leverage and short-term debt equation. In or analysis, we also include interaction variables consistent with Billett et. al. (2007) and Johnson (2003) above, and also add an interaction variable between the covenant index and the market-to-book ratio in the secured debt equation.

Table 8 Reports the results of the nonlinear 4 equation system GMM results. Our first hypothesis was that the two would be substitutes for one another. Results from Table 8 suggest neither to significantly affect the other, as both are positive but insignificant. One possible explanation for this result is that, specifically in the leverage equation, covenant index, the interaction of covenant index and growth, and secured debt appear to offer strong explanatory power. These variables were omitted in previous REIT studies and may be more important in determining firm leverage. Alternatively, the interaction of growth options within the model may work in a more complex way than is currently modeled by the interaction variables, for example we may not be including enough or the right interaction variables. We will look at an alternative model where we partition our sample into above and below median growth option groups, to investigate if possibly this resolves our discrepancy with earlier studies.

Looking at the other results of Table 8 we do observe some new and unique results compared to the current corporate finance literature, in the leverage equation. First, the coefficient on the interaction of short-term debt and growth options is not significantly different from zero, suggesting that high market to book firms do not face higher liquidity risk. Billett et. al. (2007) observed a negative and significant relationship on this coefficient, suggesting that liquidity risk does exist for high growth firms. While we do observe a negative coefficient is statistically insignificant at even a 10% level.

Second, one of the main findings of Billett et. al. (2007) is that, for corporate non- financial firms, covenants and growth opportunities are negatively related to leverage, but that for

high growth firms, covenants attenuate the negative effect of growth opportunities. Surprisingly, we find that growth options are not significantly related to leverage, the relationship exhibits a positive sign but it is not statistically significant at better than a 10% level. This negative relationship has been documented in much of the previous literature (Barclay et. al., 2003; Giambona et. al., 2008:Johnson et. al., 2003; Rajan and Zingales, 1995). We will further examine this issue as well when we look at the partitioned sample.

Consistent with our hypothesis 2, we find that, in the leverage equation, the use of stronger covenant protection is positively related to leverage. This observed positive relationship suggests that greater covenant restrictions would offer greater protection to investors in the particular high leverage situations where the under and over investment agency conflicts are greatest, and that the use of these covenants leads to higher leverage. This positive effect of covenant protection, however is attenuated for high growth firms as demonstrated by the negative and significant interaction of covenants with market-to-book ratio. This result suggests that debt capacity concerns may be influencing higher growth firms, and that the addition of financial covenants, while increasing the ability to borrow at a higher leverage amount, would also limit future financing options, therefore reducing financial flexibility. This effect leads to the observed attenuation effect of growth opportunities on the positive relationship between covenants and the use of leverage.

Not surprisingly, covenant protection is also increasing in leverage as can be seen by the positive and significant coefficient on leverage in the covenant equation. A result that is

consistent with prior literature[21].

Looking at secured debt, note that consistent with the observed correlations in Table 5, as well as hypothesis 5, secured debt and leverage are complementary. The coefficient on secured debt is positive and significant in the leverage equation while the coefficient on leverage is also positive and significant in the secured debt equation. This result is observed even when we control for the relationship between leverage and covenants. As discussed in hypothesis 5, the relationship in the leverage equation is likely driven by the added security of high quality real estate assets offered as collateral. The relationship in the secured debt equation is possibly caused by restricted access to the public bond market. Access to the bond market is based on credit rating, and since increased leverage is a key factor in a firms credit rating, increasing leverage could reduce a firms credit rating, and either restrict access to the bond market or make it less attractive via higher financing rates.

Examining further the results of the secured debt and covenant equations, both secured debt and the covenant index are increasing in growth option, a result that is significant at better than a 1% level in both equations. Given that high growth firms have more incentive to perpetuate the under and over investment problems described in Myers (1977) it is consistent that they would be subject to higher controls on debt, via higher covenant restrictions. Similarly, consistent with hypothesis 4, high growth firms are likely to use more secured debt, as this will allow them a more accessible source of funds as compared to public bonds. In other words, high growth firms use secured debt as a liquid source of capital and may use higher amounts in the face of new investment opportunities.

[21] Billett et. al. (2007) also confirms this result.

The short-term debt equation is weakly identified in terms of the endogenous financial policy variables, as in Billett et. al. (2007). Again, we do not observe the substitutive relationship between leverage and short-term debt, as we would have expected. Several exogenous control variables; firm size, firm size squared, volatility, and term premium, do however offer statistically significant explanatory power.

Examining the relationship between secured debt and covenants for REITs, we do find evidence of a substitution effect. This is consistent with hypothesis 3, which suggests that even though secured debt and covenants both offer protection to the investor, covenants in public bonds often restrict the level of secured debt likely causing the observed negative relationship. Note that while secured debt exhibits a negative and significant sign in the covenant equation, the negative effect of covenants on secured debt only occurs for high growth firms, which is seen by the observed negative sign on the interaction between growth and covenants. This suggests that the limitation in covenant restrictions on secured debt is most relevant to the high growth firms that are most likely to utilize covenant protection.

Results for the other control variables in our analysis are consistent with prior literature. One notable exception is that for our sample of REITs, covenant restrictions are decreasing in firm size, which is opposite of the result from Billett et. al. (2007).

The Effect of the Financial Crisis

The financial crisis dramatically impacted all aspects of the real estate market. It is important to document what effect this time period had on the financial policy of REITs. To test this effect, we re-estimate the model in Table 8 but include a crisis dummy variable equal to 1 for years 2007, 2008, and 2009 and otherwise equal 0, and include that variable in all 4 capital structure variable equations. Table 9 summarizes our results. Panel A repeats the results from Table 8 and Panel B gives the new results including the crisis dummy variable. Note all exogenous variables except the market-to-book ratio are suppressed to preserve space. The results are generally consistent with and without the crisis variable. One difference is that the significance of the coefficient on the covenant index in the secured debt equation is lost but the sign remains positive. Importantly, however, the observed negative, substitutive, relationship between secured debt and covenant restrictions remains consistent, as there is still a negative sign on the interaction variable between covenant and growth options in the same secured debt equation.

Importantly, note the significance of the crisis variable, it is statistically significant in all 4 equations. Notice that the financial crisis variable positively influenced leverage, increased short-term debt, reduced secured debt, and loosened covenant restrictions.

The first effect, an increase in leverage, can be explained by due a decrease in market value, as stock prices dropped significantly during this period. The second and third effect, an increase in short-term debt while secured debt decreased, can be explained as a result of the tightening credit market, specifically the secured debt (mortgage) market. As property

values decreased, the ability to finance property was significantly reduced. Additionally, property-level financing that did occur was likely subject to shorter maturity, due to the general uncertainty in the market. The final result shows that public bonds were issued with fewer limitations, suggesting that firms with access to this market feared loss of financial flexibility and included fewer restrictions on future funding decisions.

Joint Determination of Capital Structure Partitioned by Growth Options

In Table 8 and Table 9, above growth options are treated as both an exogenous variable and an endogenous interaction variable with the covenant index and short-term debt. The results from the tables above produced statistically insignificant coefficients on leverage and short-term debt in each other's equations. In an attempt to resolve this inconsistency with prior literature, we re-run the analysis above without any growth option interaction variables, but instead partition the sample at the median value for the market-to-book ratio 1.2, generating two sub-samples. Table 10 panel A provides results for the above median growth option firms and Table 10 panel B provides the results for below growth option firms. Notice some key observations not seen in the previous interaction variable analysis.

First notice that, consistent with hypothesis 1, under this new specification, leverage and short-term debt are both positive and statistically significant at better than a 1% level in both above median and below median growth option sub-samples. The coefficients in the previous interaction variable analysis supported such results but did not produce statistically significant results. This suggests that capital structure decisions vary greatly between low

growth firms and high growth firms, and that there is a benefit to analyzing them separately for each group. The result, that leverage and maturity are substitutes, is consistent with previous corporate non-financial results (Billett et. al., 2007) and REIT results from Giambona et. al. (2008), but contrary to the one-way relationship revealed for REITs in Alcock et. al. (2014).

Second, observe that the positive sign on short-term debt in the leverage equation for both above and below median growth option groups, suggests that both groups exhibit a lack of liquidity risk, however the magnitude is lower for high growth firms. This provides evidence consistent with an attenuation effect of high firm growth options on the substitution effect of leverage and maturity, suggesting higher liquidity risk for high growth firms. Notice that this relationship would have been identified by a negative and significant sign on the interaction variable between growth options and short-term debt in the earlier specifications from tables 8 and 9. This however was not observed, as the sign was negative but insignificant. This new result from table 10 is consistent with Billett et. al. (2007) that also observed an increase in liquidity risk for high growth firms.

Third, further clarification on hypothesis 2 is provided by this partitioned sample. The effect of the covenant index on leverage is positive and statistically significant for both above median and below median growth option firms, consistent with hypothesis 2, but the magnitude of the coefficient is nearly 6 times higher in the below median growth option group, the difference in these coefficients between the two samples is consistent with the negative attenuation effect of the growth option interaction with the covenant index in the

leverage equation of Tables 8 and 9. This offers further refinement however as we see that the negative attenuation effect of growth options on the positive effect of covenants on leverage, is such that it does not completely eliminate the positive relationship, or cause it to go negative.

Fourth, the often observed negative relationship between growth options and leverage, when examined for the two samples, appears negative and significant in only the above median growth options sample, and is actually positive and statistically significant in the below median sample. This is consistent with a study by Chen and Zhao (2006) that finds leverage is positively related to market-to-book ratio for 88% of Compustat firms and that the well-documented negative relationship is driven by a small subset of high market-to-book firms.

Finally, the relationship between control mechanisms for the agency costs of debt is further clarified. The observed substitution relationship between secured debt and covenants, hypothesis 3, is only observed in the above median sample, which is consistent with the previous results of a negative and significant sign on the interaction variable between covenants and growth options in the secured debt equation. For the below median sample, it actually appears that short-term debt is substituting for secured debt instead of covenants. The best explanation for this difference in the substitution of control mechanisms goes back to an earlier argument used when discussing the relationship between secured debt and leverage. As discussed previously access to the public bond market is made less attractive when credit ratings are of lower quality, which is directly affected by firm leverage rates. Remembering from our summary statistics in table 6, that lower growth firms have much

higher median levels of leverage, it is reasonable to assume they would have limited access to the bond market. Therefore, they are more likely to utilize other control mechanisms such as increasing short-term debt. Additionally, covenant protection is much lower among below investment grade bond issues, so even if low growth firms issue in the public bond market, they are more likely issuing into the below investment grade market and are subject to fewer covenant restrictions overall.

Conclusion

Utilizing data from Mergent FISD merged with Compustat financial data from 1993- 2014, we are able to evaluate the joint determinants of capital structure for an industry that utilizes a significant amount of private property level debt, Real Estate Investment Trusts. Using the above data we solve a system of equations for four relevant financial policy variables affecting the REIT industry: Leverage, short-term debt, covenant restrictions, and secured debt (private property level mortgage debt).

In order to control for the endogeneity of the four financial policy variables, we utilize non-linear GMM to solve the system of equations. We include endogenous interaction variables between growth options and both short-term debt and covenant restrictions. Additionally, our study drops the interaction variables, and partitions the sample into above and below median growth options to examine capital structure decisions for each sub-group.

One major finding within our REIT sample is that contrary to the current corporate

literature, covenant restrictions are positively related to leverage , but that this positive effect is significantly attenuated by the presence of growth options in the firm. This result demonstrates that, as suggested in Riddiough and Steiner (2016), that a desire to maintain financial flexibility requires high growth firms that issue more covenants, to not dramatically increase their leverage, in order to maintain their debt capacity.

We also observe some key results related to secured debt. One result is that secured debt and leverage are complements. Given the high quality and redeployability of the underlying assets of REITs, issuing secured debt would give secured debt holders a priority claim in the high quality asset, increasing the allowable leverage ratio. Also, because public bond issuance is influenced by credit rating, leverage also increases secured debt, by limiting access to the unsecured bond market. Another observation is that secured debt is increasing in firm growth options. Notably secured debt, which is primarily mortgage debt, can actually act as a liquidity store for REITs and therefore is more likely utilized by high growth firms.

A third observation on secured debt is that secured debt acts as a substitute for covenant protection for high growth firms but as a substitute for short-term debt for low growth firms. A result that is likely driven by low growth firms having limited access to the investment grade public bond market.

Finally, related to the overall covenant structure of REIT bond issues, we observe that certain leverage restricting covenants do occur frequently in bond issues of investment

grade firms. However, these covenants are not nearly as common in below investment grade firms. Additionally, these leverage-restricting covenants, if they are present, occur along side other covenants that are not standardized. Covenant protection in bonds can vary from no covenants at all up to 11 covenants for a given firm in a given year. This variation reiterates the importance of controlling for the effects of such covenants when analyzing financial policy for REITs.

Having access to a significant level of secured debt, the REIT industry makes decisions in ways that other firms without this high level of secured debt may not. The preservation and use of this secured debt is fundamentally important to all the other financial policy decisions they face. Importantly, as REITs balance the cost of equity holder and debt holder conflicts imposed by the issuance of debt against the cost of the mechanisms used to reduce these conflicts, our results have shown that the use of secured debt is an important financial policy variable to consider.

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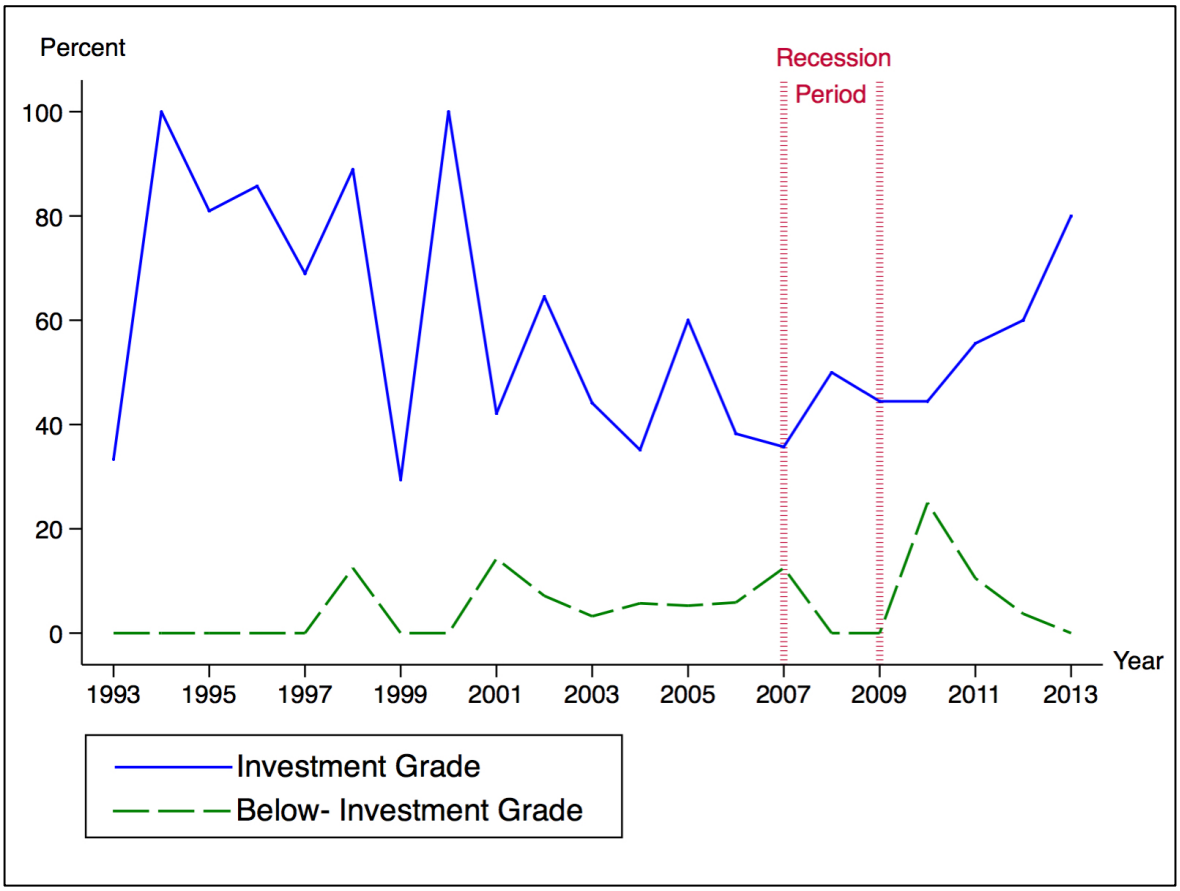
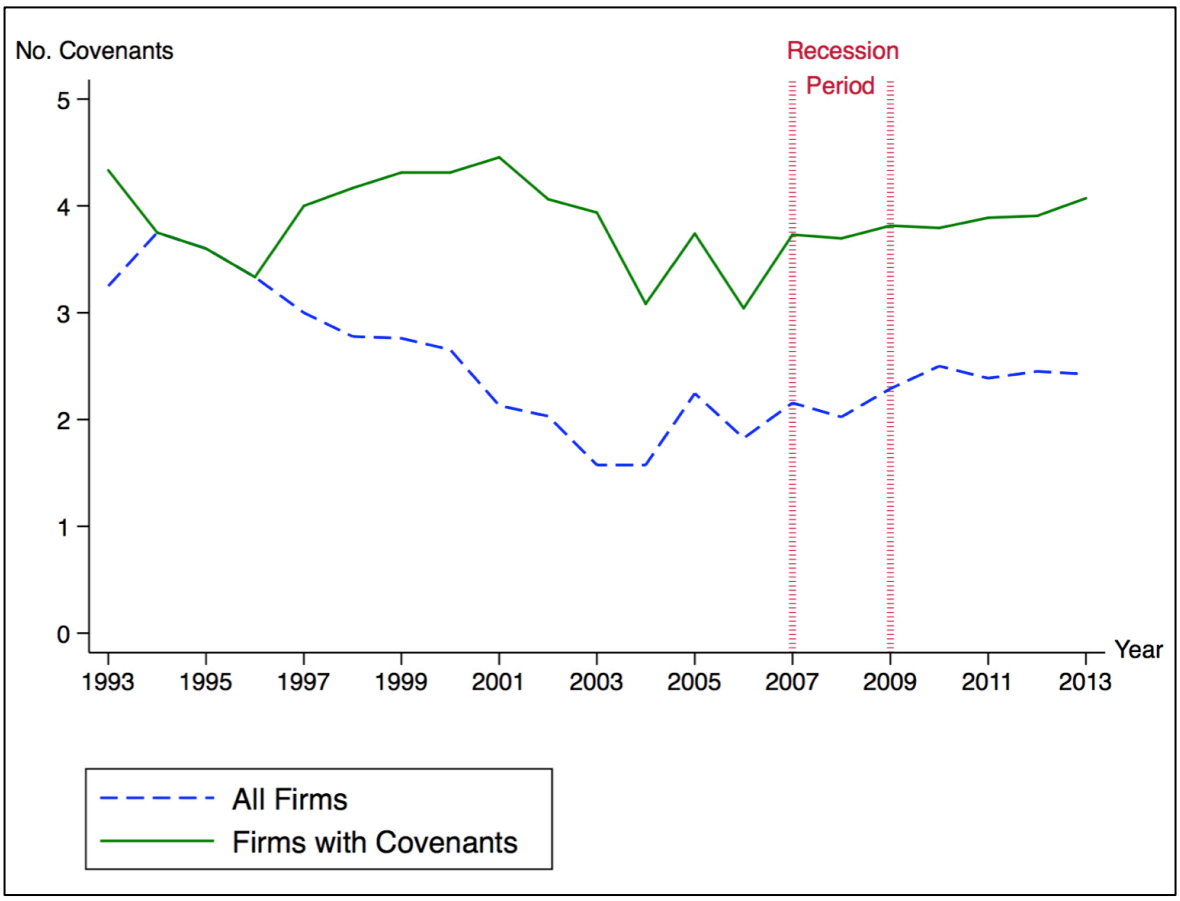
Figure 1: Total Leverage Restrictions by Bond Issue for Equity REITs 1993-2013



Notes: The above figure tracks the average number of bond issues in a given year for all bond-issuing equity REITs that contain any type of covenant restriction on total leverage of the firm. The results are presented separately for issues with an investment grade credit rating versus issues with a below-investment grade credit rating.

Figure 2: Covenant Use by Firm for Equity REITs 1993-2013



Notes: The above figure tracks the average number of covenants present across all existing bond-issues for a given firm, in a given year, for all bond-issuing equity REITs. The results are presented separately for all firms in the sample and then for only firms that have issue/s containing covenant restrictions.

Table 1. Covenant Usage by REITs Compared to Non-REITs

Covenant Restriction	REIT	Non-REIT	Difference
Secured Debt	9.3%	44.3%	-35.0%
Sale Leaseback	5.5%	29.2%	-23.7%
Dividend	6.1%	27.0%	-20.9%
Share repurchase	3.3%	22.6%	-19.3%
Asset Sale	48.7%	64.5%	-15.8%
Stock Issuance	1.6%	17.3%	-15.7%
Merger	49.0%	64.6%	-15.6%
Poison Put	13.6%	29.1%	-15.5%
Subordinated Debt	0.6%	6.0%	-5.4%
Cross Default	46.1%	51.0%	-4.9%
Investment	0.4%	4.2%	-3.8%
Ratings/Net Worth	0.4%	4.1%	-3.7%
Funded Debt	1.0%	3.0%	-2.0%
Senior Debt	0.5%	1.4%	-0.9%
Total Leverage	36.9%	30.4%	6.5%

Note: Comparison is based on the REIT sample of 726 bond issues outstanding from 1993-2014 used in this paper and compares these results to the Non-REIT sample of Billett, King, Mauer (2007) which has 15,504 issues from 1960-2003. Billett, King, Mauer (2007) specifically excludes REITs as it excludes all financials.

Table 2: Correlation Between Usage of the Different Covenant Types

Covenant Restrictions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Dividend	1.00														
2. Share repurchase	0.34 ***	1.00													
3. Funded debt	-0.02	-0.02	1.00												
4. Subordinate debt	0.24 ***	0.36 ***	-0.01	1.00											
5. Senior debt	0.11 ***	-0.01	-0.01	0.00	1.00										
6. Secured debt	0.06	0.13 ***	-0.03	0.21 ***	0.10 ***	1.00									
7. Total leverage	0.11 ***	0.16 ***	0.11 ***	0.07 *	-0.04	0.11 ***	1.00								
8. Sale / leaseback	0.05	0.16 ***	-0.02	0.16 ***	-0.01	0.36 ***	0.03	1.00							
9. Stock issuance	0.19 ***	0.29 ***	-0.01	0.41 ***	0.00	0.07 **	0.08 **	0.26 ***	1.00						
10. Ratings net worth	-0.01	0.36 ***	-0.01	0.00	0.00	-0.01	0.07 *	-0.01	0.00	1.00					
11. Cross default	0.19 ***	0.13 ***	0.11 ***	0.06	0.06	0.14 ***	0.76 ***	0.05	0.07 *	0.06	1.00				
12. Poison put	0.13 ***	0.25 ***	0.00	0.15 ***	-0.02	0.13 ***	-0.07 *	0.08 **	0.11 ***	0.15 ***	0.16 ***	1.00			
13. Asset sale	0.21 ***	0.13 ***	0.11 ***	0.05	0.05	0.21 ***	0.66 ***	0.12 ***	0.02	0.05	0.79 ***	0.13 ***	1.00		
14. Investment	0.24 ***	-0.01	-0.01	0.00	0.00	0.10 ***	0.07 *	-0.01	0.00	0.00	0.06	0.06 *	0.05	1.00	
15. Merger	0.21 ***	0.11 ***	0.11 ***	0.05	0.05	0.22 ***	0.66 ***	0.11 ***	0.02	0.05	0.79 ***	0.13 ***	0.99 ***	0.05	1.00

Note: Above Pearson correlations are for the 15 typical covenant restrictions imposed on bond issuing firms Covenant classification follows Billet, King, Mauer (2007) with the indicator variable equal to 1 if the specific covenant exists within a given issue. The sample Includes 726 individual REIT bond issues outstanding between 1993-2014. Significance at the 1%, 5% , and 10% level indicated by ***, **, and * respectively.

Table 3: Conditional Probability Between Usage of the Different Covenant Types

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Dividend		0.24	0.00	0.06	0.03	0.12	0.64	0.06	0.06	0.00	0.91	0.30	0.97	0.06	0.97
2. Share repurchase	0.53		0.00	0.13	0.00	0.27	0.93	0.20	0.13	0.13	0.93	0.67	0.93	0.00	0.87
3. Funded debt	0.00	0.00		0.00	0.00	0.00	0.88	0.00	0.00	0.00	1.00	0.13	1.00	0.00	1.00
4. Subordinate debt	1.00	1.00	0.00		0.00	1.00	1.00	0.50	0.50	0.00	1.00	1.00	1.00	0.00	1.00
5. Senior debt	0.50	0.00	0.00	0.00		0.50	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00
6. Secured debt	0.09	0.09	0.00	0.05	0.02		0.59	0.25	0.02	0.00	0.75	0.27	0.91	0.02	0.93
7. Total leverage	0.08	0.05	0.03	0.01	0.00	0.09		0.03	0.01	0.01	0.95	0.09	0.91	0.01	0.91
8. Sale / leaseback	0.11	0.16	0.00	0.05	0.00	0.58	0.47		0.11	0.00	0.63	0.26	0.84	0.00	0.84
9. Stock issuance	0.67	0.67	0.00	0.33	0.00	0.33	1.00	0.67		0.00	1.00	0.67	0.67	0.00	0.67
10. Ratings net worth	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00		1.00	1.00	1.00	0.00	1.00
11. Cross default	0.09	0.04	0.02	0.01	0.01	0.10	0.77	0.03	0.01	0.01		0.17	0.91	0.01	0.91
12. Poison put	0.12	0.12	0.01	0.02	0.00	0.14	0.29	0.06	0.02	0.02	0.70		0.67	0.01	0.67
13. Asset sale	0.09	0.04	0.02	0.01	0.01	0.11	0.71	0.04	0.01	0.01	0.87	0.16		0.01	1.00
14. Investment	1.00	0.00	0.00	0.00	0.00	0.50	1.00	0.00	0.00	0.00	1.00	0.50	1.00		1.00
15. Merger	0.09	0.04	0.02	0.01	0.01	0.11	0.71	0.04	0.01	0.01	0.87	0.16	0.99	0.01	

Note: Above conditional probabilities are for the 15 typical covenant restrictions imposed on bond issuing firms. Indicated probability, is the probability of observing a covenant restriction listed horizontally if you observe the covenant restriction listed vertically. Covenant classification follows Billet, King, Mauer (2007) with the indicator variable equal to 1 if the specific covenant exists within a given issue. The sample Includes 726 individual REIT bond issues outstanding between 1993-2014.

Table 4. Definition of Variables

Variable	Description
Leverage	total debt / market value
Maturity (≤ 3 years)	debt due in 3 years or less / total debt
Covenant Index	proportion out of 15 categorical covenant types represented in outstanding public bond issues by firm-year.
Secured Debt	secured debt/total debt
Market-to-Book	market value/ book value
Profitability	EBIT/ book value
Ln (Sales)	ln (net sales) - cpi adjusted
Volatility	standard deviation of EBIT (t-4 through t) / Average book value (t-4 through t)
Earnings Growth	[eps (t+1) - eps (t)] / Share price (t)
Asset Maturity	book value / depreciation and amortization
Term Premium	difference in month-end yield on a 10 year government bond vs. a 6 month government bill matched to fiscal year end of the firm
Convertible	Dummy = 1 if the firm has convertibe bond issues outstanding
Z-Score	(3.3*pretax income + sales + 1.4*retained earnings + 1.2 * working capital) / total assets[1]

1. Z-Score drops effect of market value / book value as this variable is already included as a dependent variable in equations where z-score is found. See Mackie-Mason (1990) and Giacomini et. al. (2015).

Table 5. Descriptive Statistics Publicly Traded REITs 1993-2013

	Bond Issuing Firms					Non- Issuers	
Variable	Mean	Median	Std. Dev.	Min	Max	Mean	Median
Leverage	0.42	0.41	0.14	0.03	0.82	0.42	0.41
Maturity (≤ 3 years)	0.31	0.29	0.16	0.01	1.00	0.35 ***	0.31
Secured Debt	0.51	0.46	0.32	0.00	1.00	0.65 ***	0.80 ***
Covenant Index	0.15	0.13	0.15	0.00	0.73		
Market-to-Book	1.29	1.22	0.33	0.59	2.66	1.25 *	1.16 **
Firm size (Sales $m)	741	442	918	32	7220	955	142 ***
Profitability %	5.04	5.10	2.51	-7.54	14.57	5.48 **	5.94 ***
Volatility %	1.28	0.80	1.45	0.16	11.88	2.37 ***	1.31 ***
Earnings Growth	-0.31	-0.08	2.63	-13.00	10.67	-0.05 *	-0.05
Asset Maturity	31.50	28.95	10.56	14.00	78.16	37.78 ***	33.98 ***
Term Premium	1.79	1.83	1.29	-0.58	3.65	1.64 **	1.67
Modified Z-score	0.11	0.14	0.27	-1.34	1.71	0.25 ***	0.22 ***
% Bonds Convertible	0.25					0.00 ***	
Property Type							
Residential	0.18					0.14 *	
Industrial /Office	0.24					0.19 **	
Retail	0.29					0.23 ***	
Lodging	0.08					0.07	
Healthcare	0.06					0.05	
Self Storage	0.02					0.02	
Diversified	0.10					0.15 ***	
Unclassified	0.03					0.15 ***	

Note: Above summary statistics are for endogenous capital structure variables as well as dependent variables for the sample of bond issuing REITs (625 firm-year observations) and compares these statistics to REITs that do not issue bonds (781 firm-year observations). Significant difference in means (medians) at the 1%, 5% , and 10% level indicated by ***, **, and * respectively.

Table 6. Descriptive Statistics Publicly Traded REITs 1993-2013

	Above Median Market-to-Book					Below Median Market-to-Book				
Variable	Mean	Median	Std. Dev.	Min	Max	Mean	Median	Std. Dev.	Min	Max
Leverage	0.38	0.36	0.11	0.03	0.74	0.48 ***	0.47 ***	0.16	0.03	0.85
Maturity (≤ 3 years)	0.29	0.27	0.15	0.00	0.74	0.34 ***	0.32 ***	0.18	0.00	1.00
Secured Debt	0.45	0.38	0.32	0.00	1.00	0.57 ***	0.57 ***	0.31	0.00	1.00
Covenant Index	0.18	0.20	0.16	0.00	0.73	0.12 ***	0.07 ***	0.14	0.00	0.60
Market-to-book	1.51	1.42	0.30	1.20	2.65	1.04 ***	1.07 ***	0.12	0.59	1.20
Firm size (Sales $m)	792	427	1062	32	7220	661 *	429	708	33	5049
Profitability %	5.65	5.35	2.26	0.61	14.60	4.91 ***	5.00 ***	2.55	-7.59	9.59
Volatility %	1.08	0.66	1.40	0.15	11.87	1.45 ***	0.97 ***	1.47	0.15	8.11
Earnings Growth	0.00	0.00	0.02	-0.14	0.18	0.00	0.00	0.09	-0.49	0.46
Asset Maturity	32.13	29.52	10.47	14.37	74.81	31.77	30.21	11.08	14.00	94.35
Term Premium	1.56	1.67	1.25	-0.58	3.65	1.94 ***	1.98 ***	1.34	-0.58	3.65
Modified Z-score	0.15	0.16	0.27	-0.65	1.71	0.08 ***	0.11 *	0.26	-1.34	0.59
% Bonds Convertible	0.25					0.27				
Property Type										
Residential	0.22					0.13				
Industrial	0.18					0.32				
Retail	0.35					0.22				
Lodging	0.03					0.14				
Healthcare	0.08					0.04				
Self Storage	0.01					0.02				
Diversified	0.12					0.21				
Unclassified	0.05					0.00				

Note: Above summary statistics compare endogenous capital structure variables as well as dependent variables for the sample of bond issuing REITs (625 firm-year observations) splitting the sample above (312 obsevations) and below (313 observation) the median market-to-book ratio of 1.20. Significant difference in means (medians) at the 1%, 5% , and 10% level indicated by ***, **, and * respectively.

Table 7. Correlations Between Endogenous Capital Structure Variables and Market-to-Book

Variable	Leverage	Maturity (≤ 3 years)	Covenant Index	Secured Debt	Market-to-Book
Leverage	1.00				
Maturity (≤ 3 years)	0.06 **	1.00			
Covenant Index	-0.05	-0.09 ***	1.00		
Secured Debt	0.26 ***	0.01	-0.33 ***	1.00	
Market-to-book	-0.43 ***	-0.07 **	0.11 ***	-0.18 ***	1.00

Note: Above Pearson correlations are for the sample of bond issuing REITs (625 firm-year observations). Significance at the 1%, 5% , and 10% level indicated by ***, **, and * respectively.

Table 8. Joint Determinates of Leverage, Debt Maturity, Secured Debt, and Covenant Structure

	Dependent Variables			
Independent Variable	Leverage	Maturity (≤ 3 years)	Secured Debt	Covenant Index
Leverage		0.239	0.799 *	2.585 ***
		(0.85)	(1.92)	(7.16)
Maturity (≤ 3 years)	0.618		0.123	0.131
	(0.99)		(0.28)	(0.35)
Covenant Index	1.017 ***	0.238	2.156 **	
	(4.18)	(0.32)	(2.10)	
Secured Debt	0.473 ***	-0.193		-0.952 ***
	(7.01)	(-1.22)		(-7.84)
Market-to-Book x Covenant Index	-0.371 *	-0.395	-2.901 ***	
	(-1.89)	(-0.72)	(-3.55)	
Market-to-Book x Maturity	-0.251			
	(-0.52)			
Market-to-Book	0.116	-0.024	0.425 ***	0.297 ***
	(0.68)	(-0.21)	(2.96)	(4.06)
Profitability	-1.790 ***			
	(-5.36)			
Ln (Sales)	0.008	-0.507 ***		-0.050 ***
	(0.93)	(-2.85)		(-3.11)
Ln (Sales)^2		0.042 ***		
		(2.98)		
Volatility	-1.551 ***	-3.907 *		3.649 ***
	(-3.42)	(-1.76)		(3.76)
Earnings Growth		0.145		
		(1.20)		
Asset Maturity		-0.002		
		(-1.46)		
Term Premium		0.011 *		
		(1.87)		
Convertible				-0.050 *
				(-1.89)
Z Score			0.126	0.309 ***
			(1.24)	(3.02)
Property Type Dummy Variables				
Industrial / Office			-0.088	
			(-1.34)	
Retail			0.131	
			(1.46)	
Lodging			0.147 **	
			(2.08)	
Healthcare			-0.018	
			(-0.13)	
Self storage			-0.105	
			(-0.85)	
Diversified			0.172 ***	
			(2.62)	
Unclassified			0.518 **	
			(2.52)	
Intercept	-0.068	1.958 ***	-0.233	-0.664 **
	(-0.30)	(3.28)	(-0.70)	(-2.55)
Overidentification Statistic		0.1723		
Firm-Year Observations		625		
Firms		104		

Note: Above system of equations is estimated using nonlinear GMM. The sample includes 625 firm year observations from 1993-2013. Covenant index is as in Billett, King, Mauer (2007) and is scaled as the proportion of all 15 covenants outstanding for a given firm-year observation and ranges from 0-1. Standard errors are consistent in the presence of heteroskedasticity and correlation among firm clusters. Significance at the 1%, 5% , and 10% level indicated by ***, **, and * respectively.

Table 9. Joint Determinates of Leverage, Debt Maturity, Secured Debt, and Covenant Structure - Effect of Financial Crisis

A. Full Sample Without Crisis Dummy Variable

	Dependent Variables			
Independent Variable	Leverage	Maturity (≤ 3 years)	Secured Debt	Covenant Index
Leverage		0.239	0.799 *	2.585 ***
		(0.85)	(1.92)	(7.16)
Maturity (≤ 3 years)	0.618		0.123	0.131
	(0.99)		(0.28)	(0.35)
Covenant Index	1.017 ***	0.238	2.156 **	
	(4.18)	(0.32)	(2.10)	
Secured Debt	0.473 ***	-0.193		-0.952 ***
	(7.01)	(-1.22)		(-7.84)
Market-to-Book x Covenant Index	-0.371 *	-0.395	-2.901 ***	
	(-1.89)	(-0.72)	(-3.55)	
Market-to-Book x Maturity	-0.251			
	(-0.52)			
Market-to-Book	0.116	-0.024	0.425 ***	0.297 ***
	(0.68)	(-0.21)	(2.96)	(4.06)
Crisis Period Dummy	No	No	No	No
All Other Control Variables	Yes	Yes	Yes	Yes
Overidentification Statistic	0.1723			
Firm-Year Observations	625			
Firms	104			

B. Full Sample With Crisis Dummy Variable

	Dependent Variables			
	Leverage	Maturity (≤ 3 years)	Secured Debt	Covenant Index
Leverage		0.102	1.025 **	2.329 ***
		(0.40)	(2.14)	(6.43)
Maturity (≤ 3 years)	0.666		0.589	0.554
	(1.03)		(1.19)	(1.40)
Covenant Index	1.030 ***	0.128	1.161	
	(4.25)	(0.21)	(0.99)	
Secured Debt	0.462 ***	-0.106		-0.939 ***
	(6.97)	(-0.77)		(-6.90)
Market-to-Book x Covenant Index	-0.378 *	-0.213	-2.239 **	
	(-1.87)	(-0.48)	(-2.55)	
Market-to-Book x Maturity	-0.347			
	(-0.70)			
Market-to-Book	0.138	-0.080	0.426 ***	0.316 ***
	(0.77)	(-0.82)	(3.24)	(3.72)
Crisis Period Dummy	0.043 ***	0.058 **	-0.115 *	-0.175 ***
	(3.02)	(2.26)	(-1.87)	(-3.89)
All Other Control Variables	Yes	Yes	Yes	Yes
Overidentification Statistic	0.1275			
Firm-Year Observations	625			
Firms	104			

Note: Above system of equations are estimated using nonlinear GMM. The sample includes 625 firm-year observations from 1993-2013 for REITs that issue bonds only. Covenant index is as in Billett, King, Mauer (2007) and is scaled by 15, to generate a possible range from 0 to 1. The crisis variable is equal to 1 if the year is 2007-2009 and equal to 0 otherwise. Control variables other than market-to-book are suppressed, but are consistent with Table VI. Standard errors are consistent in the presence of heteroskedasticity and correlation among firm clusters. Significance at the 1%, 5% , and 10% level indicated by ***, **, and * respectively.

Table 10. Joint Determinates of Leverage, Debt Maturity, Secured Debt, and Covenant Structure - Sample Partitioned by Growth Options

A. Market-to-Book Ratio Above Median (No Interactions)

	Dependent Variables			
Independent Variable	Leverage	Maturity (≤ 3 years)	Secured Debt %	Covenant Index
Leverage		1.353 ***	3.727 ***	3.815 ***
		(2.62)	(3.60)	(3.60)
Maturity (≤ 3 years)	0.294 ***		1.027	-0.525
	(3.12)		(1.44)	(-1.28)
Covenant Index	0.112 *	-0.175	-1.246 ***	
	(1.81)	(-0.47)	(-3.68)	
Secured Debt	0.292 ***	-0.274		-1.123 ***
	(8.70)	(-1.22)		(-5.01)
Market-to-Book	-0.049 **	0.093	0.302 *	0.181 *
	(-2.23)	(1.17)	(1.76)	(1.84)
Crisis Dummy	Yes	Yes	Yes	Yes
Other Control Variables	Yes	Yes	Yes	Yes
Overidentification Statistic		0.4097		
Firm-Year Observations		312		
Firms		73		

B. Market-to-Book Ratio Below Median (No Interactions)

	Dependent Variables			
	Leverage	Maturity (≤ 3 years)	Secured Debt %	Covenant Index
Leverage		0.549 ***	-0.622	0.979 ***
		(2.86)	(-1.28)	(3.98)
Maturity (≤ 3 years)	0.480 ***		-1.187 *	0.852 ***
	(2.80)		(-1.71)	(3.53)
Covenant Index	0.670 ***	0.126	-0.485	
	(2.78)	(0.47)	(-0.67)	
Secured Debt	0.486 ***	-0.435 **		-0.124
	(4.26)	(-2.53)		(-0.97)
Market-to-Book	0.315 **	-0.432 **	-0.468 **	0.514 ***
	(2.04)	(-2.20)	(-1.98)	(3.77)
Crisis Dummy	Yes	Yes	Yes	Yes
Other Control Variables	Yes	Yes	Yes	Yes
Overidentification Statistic		0.2454		
Firm-Year Observations		313		
Firms		78		

Note: Above system of equations are estimated using GMM. The sample includes 625 firm-year observations from 1993-2013 for REITs that issue bonds only. Covenant index is as in Billett, King, Mauer (2007) and is scaled by 15, to generate a possible range from 0 to 1.. Sample is partitioned above and below the median Market-to-book ratio of 1.20. Control variables other than market-to-book are suppressed, but are consistent with Table VI. Standard errors are consistent in the presence of heteroskedasticity and correlation among firm clusters. Significance at the 1%, 5% , and 10% level indicated by ***, **, and * respectively.