Asset Liquidation Value and Choice of Financing: Evidence from Real Estate Investment Trusts

Crocker Liu, Peng Liu, Zhipeng Zhang*

March 2, 2010

Abstract

Shleifer and Vishny (1992) provide a theory linking the liquidation value of the assets of a firm to the financing choice of a firm. According to this theory, assets that a firm finds harder to shift into alternative uses will have a lower liquidation value during periods of distress, and as such are harder to finance with debt ex-ante. Real Estate Investment Trusts (REITs) provide a natural venue to test this hypothesis since the assets of a REIT are relatively easier to value. We use capitalization rates, recoveries in foreclosures, and lease structures to construct a metric to measure the liquidation value of each REIT. Using the incremental financing decisions of all equity REITs between 2000 and 2008, we show that REITs with high asset liquidation values prefer to issue debt rather than equity when faced with a choice of financing. The effect of expected liquidation value is significant, even after controlling for other factors that influence financing decisions, such as leverage ratio target (tradeoff theory), growth opportunities (pecking order theory) and NAV/Equity (market timing).

*Crocker Liu is at the Carey School of Business, Arizona State University; Peng Liu is at the School of Hotel Administration, Cornell University; Zhipeng Zhang is at the Graduate School of Business, Stanford University.

1 Introduction

The illiquidity of corporate assets poses a significant private cost to firms that choose to finance with debt. When a firm is in financial distress and has to liquidate its assets, potential industry buyers, i.e., peers within the same industry are likely to be cash constrained and therefore cannot pay full value for the assets. Shleifer and Vishny (1992) explore the effect of liquidation values on corporate debt capacity and predict that firms with relatively more illiquid assets will prefer equity financing to debt, ex-ante. In this paper, we test the Shleifer-Vishny hypothesis that asset liquidation values influence firms' financing choices by examining the incremental financing decisions of a unique sample of real estate investment trusts (REITs).

The REIT industry provides an ideal laboratory for testing the cross-sectional patterns of firms' financing choices predicted by Shleifer and Vishny (1992) for several reasons. First, REITs are required to hold and derive incomes primarily from commercial real estate assets and the values of these properties can be measured relatively easily. This is because the commercial real estate propoties are actively traded in secondary markets, both privately and publicly. In addition, the homogeneity of REIT operations reduces the need to control for other factors influencing a firm's financing decisions. For example, tax-based motivations for issuing securities are ruled out since REITs do not pay corporate income tax. Moreover, REIT income is passive income and REIT stocks are normally referred to as cash stocks rather than growth stocks. Finally, since very few REITs invest in different property types, each property type represents a distinct line of business. Therefore, the liquidity and redeployability of firm's assets vary systematically with property type. This is a perfect analogy to the industry-to-industry variations that Shleifer and Vishny discuss.

This work follows in the tradition of earlier research that empirically tests the effect of liquidation value on a firm's capital structure choices. For example, Benmelech, Garmaise, and Moskowitz 2005 use commercial property zoning laws as a proxy for liquidation values. They find that higher liquidation values are associated with longer term loans, smaller number of creditors, higher loan-to-value ratios, and lower interest rates. However, they study project specific financing and not capital structure choices of firms. Studying the nineteenth-century American railroad industry and U.S. airline industry respectively, Benmele (2009) and Benmelech & Bergman (2009) find that firms with more salable assets and redeployable collateral tend to have lower cost of external financing and debt financing with longer maturities. Measuring asset liquidation value by lease maturity and recovery rate in foreclosure, Giambona, Harding and Sirmans (2008) are the first to test the Shleifer-Vishny hypothesis in REITs. We extend their study in three important respects. We use the choice of a firm's security issuance as the dependent variable in lieu of using leverage ratios. If the leverage of a firm is a cumulative consequence of incremental financing activities, then we hope to provide a whole picture of this topic. Second, we offer a theoretical model which links asset characteristics to REIT liquidation value; and finally we theoretically prove and empirically test the notion that the capitalization rate determines REIT liquidation value, which is not present in Giambona, et al (2008).

We develop a simple valuation model of REITs to understand the drivers of REITs' liquidation value. In the model, a REIT derives constant net operating incomes from a portfolio of commercial properties. Upon default, which arrives randomly according to a Poisson process, the REIT liquidates its assets as a whole to homogeneous second-best users. New owner of these properties initially suffers from an discounted operating cash flow due to lack of information and operating experiences. The discount, however, dissipates over time and the operating income eventually recovers to the pre-default level. Based on our model, three factors affect REITs' liquidation values, namely the value-weighted average lease term, the CMBS loss severity, and the capitalization rate. We empirically examine the effects of these proxies of REITs' liquidation values on REITs' incremental financing decisions using multivariate logit regressions. We document that, consistent with the Shleifer-Vishny hypothesis, the choice to issue debt is inversely related to the historical loss severity and the capitalization rate, and is positively related to the weighted average lease terms.

The remainder of this paper is organized as follows. Section 2 provides a simple reduced-form model of a REIT's liquidation value, based on which we derive the factors that affect a REIT's liquidation value. Section 3 describes the data and discusses our proxies of REITs' liquidation values. Section 4 empirically tests the Shleifer–Vishny hypothesis. Finally, Section 5 concludes the paper.

2 Theoretical Determinants of Liquidation Value for REITs

By constructing models of the liquidation value of a real estate investment trust, one can predict how various factors affect the cross-sectional and time-series distribution of realized choices of corporate financing decision. This section discusses a simple reduced-form model of firm valuation and uses comparative statics to determine how market conditions and firm characteristics interact to affect firm's liquidation value and security issurance choice.

2.1 The Model

A real estate investment trust (REIT) operates a portfolio of commercial real estate assets, which generates a constant cash flow of I per unit of time until default[1]. A default event occurs according to a Poisson process with an

[1] In reality, net operation income (NOI), which is rental income net of operating expenses, may not a constant. However, REITs obtain their rental revenue from long-term leases with scheduled lease rollover. Both income and expenses are highly predictable (REIT income is also called passive income). Modeling a constant cash flow is equiva-

exogenous hazard intensity of λ.

By regulation, REITs must hold 75% asset in real properties. We assume the firm's value of a REIT equals the total values of asset it holds. We further assume that, due to private information, geographical expertise, and reputation developed in operating the portfolio properties, the current REIT is the first-best owner, in the sense that the properties under current REIT management generate the highest cash flows than any other REITs. Upon default, the REIT liquidates its portfolio of properties as a whole to homogeneous second-best owners on the competitive secondary market. Over time, the new owner gradually attains private information, develops expertise, and rebuilds the reputation by managing the properties. Hence, as time passes by, the cash flow reverses to the pre-default level. We assume that the cash flow generated under the management of the second-best is $(1-\beta e^{-\kappa t})\, I$, where $\beta \in (0,1)$ captures the instant discount of the cash flow at liquidation[2], κ measures the speed of recovery of the cash flow to its pre-default level, and t is the length of time after default.

All market participants are risk-neutral and they discount future cash flows by the constant risk-free rate, r. The market value of the REIT is the sum of the present value of its cash flow until default and the present value of the liquidation value upon default. That is,

$$V_0 = E_0\left[\int_0^{\tau_\lambda} e^{-rs} I\ ds + e^{-r\tau_\lambda} V_1\right], \tag{1}$$

where, for simplicity, we assume the current time is 0 and denote τ_λ the time

lent to generating an cash-flow annuity, which swaps the difference between the constant annuity payout and the realized cash flow with the increase (or decrease) of the asset value. Some rental contracts, especially in retail sector, have a step-up leases or escalation clauses. This type of contracs can be regarded as asset value grow at a positive rate.

[2]Shleifer and Vishny 1992 claims that real estate apprasers typically assume that the rapid sale of real estate leads to price discount of 15 to 25 percent relative to the orderly sale that might take several months. Kaplan 1989 cites Merrill Lynch estimates that the distressed sale of the Campeau retail empire would bring about 68 percent of what an oderly sale would bring.

of default. $E_0(\cdot)$ is the expectation taken at time 0. V_1 is the market value of the liquidating properties at τ_λ. V_1 is the sum of the present value of the cash flows under a new REIT until the next default and the present value of the liquidation value upon the next default. That is,

$$V_1 = E_0\left[\int_0^{\tau'_\lambda} e^{-rt}\left(1-\beta e^{-\kappa t}\right) I\ dt + e^{-r\tau'_\lambda} V_1\right], \tag{2}$$

where τ'_λ denotes the time between the first and the second defaults. The terminal value is also V_1 because upon the second default, the homogeneous and competitive second-best owners are facing exactly the same situation as the new REIT faces at the first default. Solving (2), we get

$$V_1 = \frac{I}{r}\left(1-\beta\frac{r+\lambda}{r+\lambda+\kappa}\right). \tag{3}$$

From (1), we get

$$V_0 = \frac{1}{r+\lambda}\left(I+\lambda V_1\right). \tag{4}$$

We normalize the liquidation value V_1 by the REIT's current market value. That is,

$$L \equiv \frac{V_1}{V_0} = \frac{(r+\lambda)V_1}{(I+\lambda V_1)}. \tag{5}$$

The smaller the normalized liquidation value, L, the higher are the liquidation costs, and hence, according to Shleifer and Vishny (1992), the less likely is the REIT to finance with debt than equity *ex ante*.

We now focus on three factors that affect the normalized liquidation value, L.

2.2 Measuring the Determinants of REIT Liquidation Value

Equations (5) and (3) provide theoretical framework for the determinants of REIT liquidation value. In particular, we determine the liquidation value using the following three measures:

2.2.1 Average Lease Term

By regulation, 95% of REIT gross income must come from rental income or other passive investment such as treasuries. REIT property value is capitalized future rents, which are contracted in leases. Therefore, leases are often called the engines that drive property values. A longer average lease term implies stable long-term cash flows. In the framework of our model, if the REIT has a long average lease term, the new owner will retain the optimal level (I) of cash flows faster (larger κ). According to (3) and (5),

$$\frac{\partial L}{\partial \kappa} = \frac{\beta I^2 (r+\lambda)^2}{r(I+\lambda V_1)^2 (r+\lambda+\kappa)^2} > 0.$$

Therefore, our model predicts a positive effect of average lease term on the normalized liquidation value.

2.2.2 Capitalization Rate

Capitalization rate measures expected yield of a property's transaction. We define the instantaneous capitalization rate C as the net operating cash flow, I, divided by the market value, V_0. That is,

$$C = \frac{I}{V_0}.$$

Now, we divide both sides of (4) by V_0, we get

$$1 = \frac{1}{r+\lambda}\left(C + \lambda L\right). \tag{6}$$

Solving for L, we get

$$L = \frac{1}{\lambda}\left(r + \lambda - C\right). \tag{7}$$

Therefore, our model predicts that higher cap rate is associated with lower normalized liquidation value.

2.3 Loss Severity

The essence of the fire-sale effect proposed by Shleifer and Vishny (1992) is that a liquidation of illiquid assets experiences a discount, since the firm's assets hard to be redeployed. In our model, such loss severity is captured by β, the immediate drop in the generated cash flows at the time of liquidation. Based on (3) and (5), we get

$$\frac{\partial L}{\partial \beta} = -\frac{I^2\left(r+\lambda\right)^2}{r\left(I+\lambda V_1\right)^2\left(r+\lambda+\kappa\right)} < 0.$$

Therefore, our model predicts a negative effect of loss severity on the normalized liquidation value.

3 Sample Description

By measuring the variables described above, one could test whether the level of liquidation value explains firm's choice of financing. This section describes the data used to measure the value of REIT liquidation. Table **??** provides simple descriptive statistics for each of the variables as well as the correlations among them.

Our data are obtained from several sources. The data on REITs' incremental financing decisions are from National Association of Real Estate Investment Trusts (NAREIT), covering all equity REITs' public security offerings from January 2000 through April 2009. Overall, there are 1217 new issues, including 536 bond issues and 681 equity issues from 163 REITs during this period. We proxy the liquidation values of REITs using three distinct variables.

Weighted average lease term: SNL provide lease expiration structure for each firm each quarter. REITs obtain their rental revenue from term leases with scheduled lease rollover. The value weighted lease expiration structure provide a good proxy for REIT liquidation value, as longer average lease term guarantees stable income with low risk of lease rollover and predicts higher liquidation value. We focus on the specified sample period because the data on lease structure start from 2000. After matching to the data on lease structure, our final sample consists of 1072 new offerings, which involve 491 bond issues and 581 equity issues from 133 REITs.[3]

Loss severity: As a measure of loss severity, we exploit the property-type historical average rate loss severity from foreclosed properties in securitized CMBS deals provided by Standard & Poor's CMBS Quarterly Insights[4] $(2000 - 2005)$ and the U.S. structured products research $(2005 - 2009)$ from LehmanLive[5].To investigate the potential effect of combining data from these two different data sources, we include in the regression analysis a dummy variable that is set to 1 for years in and after 2005, and 0 otherwise. The estimated coefficient on this dummy variable is statistically insignificant.

Capitalization rate: Market capitalization rate (cap rate) is one of the most important factors determining the value of commercial real estates.

[3]To control for the concern about a selection problem, we compare our final sample to the original sample of all REITs' offerings. There is no significant difference between the summary statistics of the two groups of REITs. For simplicity of presentation, the results are not reported.

[4]We thank John Harding for providing CMBS loan defaults and loss data used in his study with Giambona and Sirmans.

[5]Now became Barclays Capital Live.

Defined as a ratio of net operating income (NOI) expected to obtain from a real estate property over the property price, the cap rate reflects the rate of return a property will pay for itself. This paper uses an average cap rate weighted by the firm's exposure in different properties as an explanatory variable. For each property hold by a REIT, a comparable set of properties is draw from CoStar database that match the location, property and market condition. The CoStar tranctional cap rates are used to calculate each REIT property's cap rate.

Other Variables: We derive accounting information, such as total book assets, total debt, and returns on average assets, from SNL, complemented when possible by Compustat.

4 Multivariate Tests of REIT Choice of Financing and Firm Liquidation Value

Using three measures of firm liquidation value, we examine the relationship between REIT choices of security issurance and the factors that should affect them. Everything else the same, the higher the measure of liquidation value of a firm's asset, the higher the capacity of debt financing, the more frequent the debt security issurance. Specifically, we test the following three hypotheses: (1) the lower the default probability, the higher the liquidation value and thus more the use of debt instruments; (2) the higher the recovery in the liquidation, more the use of debt instruments; (3) the lower the capitalization rate the higher the higher the liquidation value and thus more the use of debt instruments.

4.1 Controlling for Competitive Explanations

In conducting a more formal regression analysis, we control for determinants of financing choice that are commonly used in the capital structure literature.

In particular, we control for effects of the trade-off theory (leverage ratio, distress costs), the pecking order theory (profitability, growth opportunity), and the market timing theory (Market-to-book, NAV-to-equity ratio). In addition, we control for common variables such as firm size, macroeconomic conditions, and credit ratings. Firm fixed effect is controlled by firm dummies. Multiple alternative measures of these control variables are considered for robustness.

4.1.1 Trade-off theory

The trade-off theory, first considered by Kraus and Litzenberger (1973), hypothesizes that firms balance benefits (e.g. tax savings) against costs (e.g. deadweight bankruptcy costs) from debt. The key implication of the trade-off theory is that firms adjust their leverage ratios towards optimal target levels so that deviations from the target are gradually eliminated. That is, under the trade-off theory, each incremental financing activity is to adjust a firm's overall leverage to reach its optimal level. A firm in need of external finance should issue equity if its leverage ratio is above the target and issue debt if it is below.

Following the vast empirical literature testing the trade-off theory, we control for the targeting behavior of corporate financing choice (see, among others, Flannerya and Rangan, 2006, Lewellen, 2006). In particular, we include the market leverage ratio prior to a new security issue as a control variable. The market leverage ratio, defined as total debt divided by the sum of total book assets and the difference between the market value of equity and book equity, should predicts whether firms raise new capital with debt or equity according to the trade-off theory.

4.1.2 Pecking order theory

The pecking order theory was developed by Myers and Majluf (1984). It states that, when facing financing needs, firms prioritize their sources of financing; internal funds are used first, and when it is it is depleted, debt is issued, and when the debt capacity is reached, equity is issued.

The pecking order theory predicts a inverse relationship between profitability and leverage ratio (Vasiliou, Eriotis and Daskalakis, 2003; Saeed, 2007). This is because profitable firms have financial surplus. These firms mainly use internal finance when necessary, and hence their use of external sources of financing remains in low level. The negative association between profitability and leverage which supports the pecking order theory has been empirically documented by Fama and French (2002), Myers (1984), Baskin (1989), Friend and Lang (1988) and Rajan and Zingales (1995).

In order to control for the inverse relationship between profitability and the use of debt, we include three different measures of profitability, namely NI/SALE, NI/Average Total Assets, and NI/Average Book Equity.

4.1.3 Market timing theory

Baker and Wurgler (2002) explore managers' practice of timing the equity market. That is, managers issue shares at high prices and repurchasing at low prices. They document convincing evidence for this policy. They demonstrate that, as implied by market timing, not only does market-to-book ratio affect capital structure through equity issues, but the negative effect is persistent and helps to explain cross sectional variation in leverage. These effects are unable to be explained by existing capital structure theories.

Feng, Ghosh, and Sirmans (2007) empirically examine the relationship between markt-to-book and leverage ratio for REITs. Contrary to the finding of Baker and Wurgler (2002), their results suggest that REITs with historically high market-to-book ratio tend to have persistently high leverage ratio. They explain their finding by the special regulatory environment of REITs where, despite no apparent benefits to debt financing, management issues debt.

To control for the market timing effect, we include the market-to-book ratio to measure growth opportunities, where the market value of assets equals the book value of assets plus the difference between market value of equity and book value of equity.

4.1.4 Other

For firms that have high quality, the costs associated with new debt issues are low, which make debt financing more appealing for these firms. We include in our regressions firm size, measured by the logarithm of firm book assets to control for firm quality.

Information asymmetry plays an significant role in determining financing choices. We include earnings growth as a measure of the ex ante expected signaling value of an equity issue, as higher earnings growth signals favorable information. In addition, we also enter the prior year percentage change in the firm's share price, because, as argued by Bagnoli and Khanna (1987), a firm's stock price increases when investors believe the firm has experienced a positive improvement in its prospects. Hence, investors require a smaller lemons premium on newly issued shares after an increase in stock prices than than during periods of flat or declining stock prices. Finally, we also control for dilution by including the ratio of the size of new issue to the market value of existing equity, as wealth transfer from new to existing shareholders is more likely to occur with greater share dilution.

We also include firm dummy variables to control for firm-fixed effects. The predicted effects on REITs' financing decisions are summarized in Table 1.

[Table 1 Here]

4.2 Results

4.2.1 Descriptive analysis

We examine the summary statistics of the sample REITs and their characteristics prior to new security issues. Table 6 presents the distribution of new security issues by REITs' property focus. Public bond issues are clustered in office, residential, and retail. Equity issues are more evenly distributed among different property focuses except for retail. Another observation is that overall, REITs that choose to issue bonds are larger in size than REITs that issue equity. Note that the total number of firms across different property focuses is 156, larger than 133, the number of all REITs in our final sample. This is because a REIT's property focus evolves over time.[6]

[Table 2 Here]

Figure 1 illustrates how the number of security issues in each year vary with the aggregate U.S. bond spreads. It shows that the total number of debt issues is negatively related with the bond spreads, while the number of equity issues and the total number of issues are not affected strongly by the bond market conditions.

[Figure 1 Here]

We investigate the effect of liquidation value on financing choice by a univariate analysis. Table 6 summarizes the descriptive statistics of our measures of firms' liquidation values and the explanatory variables. Consistent with the predictions of our model and Shleifer and Vishny (1992), firms that offer bonds have a longer mean weighted average lease term than equity-offering firms, while the relationship is reversed for the capitalization rate and the historical loss severity. The difference are highly statistically

[6] In our final sample, there are 15 firms that change their property focus once and 4 firms that change their property focus twice during the sample period.

significant. These results suggest that higher expect liquidation values are associated with higher likelihood of bond than equity issues.

[Table 3 Here]

Table 6 also compares the distributions of our explanatory variables. The results suggest that relative to REITs that offer equity, REITs raise funds by issuing bonds on average have larger sizes, less current market leverage ratios, smaller offering amounts relative to the value of book assets, and higher market-to-book ratios. Except for the market-to-book ratio, the results are consistent with existing empirical evidence. In the literature, however, higher market-to-book ratios are documented to be associated with low leverage. We show that this effect is attributed to firm-fixed effect where a few firms with high market-to-book ratios repeatedly issue bonds. After controlling for the firm-fixed effect, as shown in the results of our multivariate analysis, we find a significant negative association between the likelihood of bond issues and market-to-ratios.

4.2.2 Regression analysis

We deploy multivariate logit regressions as our main tool of studying the choice of new securities. The dependent variable is set to 1 for bond issues and 0 for equity issues. Liquidation value is measured by three different variables, namely the weighted average lease term (in number of years), the capitalization rate, and the historical CMBS loss severity. According to our model, we expect a positive loading on the weighted average lease term and negative loadings on the other two measures.

Our control variables include firm size (*log(Book Assets)*), current market leverage ratio (*Market leverage*), the growth of funds from operations (*FFO growth*), the offering amount divided by book assets (*Dilution*), return on average assets (*Profitability*), and the market-to-book ratio. In addition, we also include firm dummy variables to control for firm-fixed effects, because the REITs in our final sample often have multiple new security issues during our sample period. These factors are motivated by existing theoretical and empirical studies on capital structure, as explained in Section 4.1 on control variables.

Table 4 reports the regression results. Consistent across all three different measures of liquidation value, our empirical evidence supports the Shleifer-Vishny hypothesis. That is, REITs with low asset liquidation values are less likely to issue bonds to raise additional funds. The effect is statistically significant at the 1% level. Moreover, the effect is also economically significant. A one-standard deviation increase in the measures of the liquidation value is associated with a change in the probability of issuing bonds by $6-12\%$.

[Table 4 Here]

The market leverage prior to a new security issue has a significant negative impact on the use of bonds, consistent with the trade-off theory. Our estimates suggest that a REIT with a one-standard deviation (0.14) higher market leverage is on average 30% less likely to issue bonds. Consistent with the market-timing hypothesis, our results indicate a strong negative relationship between debt financing and the market-to-book ratio. That is, managers of REITs also time the market when they make financing decisions. They are more likely to issue equity when the market valuation is high, confirming the result of Boudry, Kallberg and Liu (2009), who use REIT Net Asset Value (NAV) to book value as market timing predictor. Our results, however, find no support of the pecking order theory in REITs, which predicts a negative association between profitability and the use of debt. Our profitability measure, ROAA, has no significant effect on REITs' choice of new security issues.

5 Conclusion

This paper provides empirical evidence that is consistent with the hypothesis of Shleifer and Vishny (1992) by examining the incremental financing choices of all equity real estate investment trusts (REITs) between January 2000 and April 2009. Since the assets of REITs are relatively easier to value, REITs provide an ideal laboratory to study the choice of firm financing and liquidation value.

We construct a simple valuation model to determine the factors that should influence REIT liquidation value and financing choice. We then test whether our model predicts the observed choices that firms make in terms of their choice to issue debt or equity. We find that REITs with low asset liquidation values are less likely to issue debt to raise additional funds as predicted. The effect is both statistically (1% level) and economically significant. A one-standard deviation increase in the measures of the liquidation value is associated with a 6-12% change in the probability of issuing debt. Furthermore, our results are consistent with the trade-off theory and the market timing theory of capital structure. However, we do not find any support for the pecking order theory in REITs.

6 Appendix. Model with Cash Flow Growth

[Note: For the equation numbers, please refer to the model without cash flow growth.]

If we assume the growth rate of the cash flow is a constant g, then Equations 1 and 2 become

$$V_0 = E_0 \left[\int_0^{\tau_\lambda} e^{-rt} e^{gt} I \; dt + e^{-r\tau_\lambda} V_1 \right],$$

and

$$V_1 = E_0 \left[\int_0^{\tau'_\lambda} e^{-rt} \left(1 - \beta e^{-\kappa t}\right) e^{gt} I \; dt + e^{-r\tau'_\lambda} V_1 \right],$$

which lead Equations 3 and 4 to

$$V_1 = \frac{I}{r} (r + \lambda) \left(\frac{1}{r - g + \lambda} - \beta \frac{1}{r - g + \lambda + \kappa} \right),$$

and

$$V_0 = \frac{I}{r - g + \lambda} + \frac{\lambda}{r + \lambda} V_1.$$

Now if we define the capitalization rate as the ratio of the initial level of cash flow, I, to the inital value of the property, V_0, we get $C = \frac{I}{V_0}$. In this case, Equation 7 becomes

$$L = \left(1 + \frac{r}{\lambda}\right) \left(1 - \frac{C}{r - g + \lambda}\right).$$

References

[1] Acharya, Bharath, and Srinivasan, 2007, Does industrywide distress affect defaulted firms? Evidence from creditor recoveries, Journal of Financial Economics 85, 787-821.

[2] Allen, M., Capital Structure Determinants in Real Estate Limited Partnerships The Financial Review VOL. 30 No. 3 AUGUST 1995 PP. 399426

[3] Altman, Brady, Resti, and Sironi, 2005, The link between default and recovery rates: Theory, empirical evidence, and implications, Journal of Business 78, 2203-2228.

[4] Baker, M. and Wurgler, J., Market timing and capital structure, Journal of Finance 62, 1-32

[5] Baskin J., (1989) "An Empirical Investigation Of The Pecking Order Hypothesis", Financial Management, No. 18, pp. 26-35.

[6] Benmelech, E, Asset Salability and Debt Maturity: Evidence from Nineteenth-Century American Railroads, Review of Financial Studies 2009 22(4):1545-1584

[7] Benmelech, E., and Nittai K. Bergman, Collateral pricing, Journal of Financial Economics, Volume 91, Issue 3, March 2009, Pages 339-360

[8] Benmelech, E., M.J. Garmaise, and T.J. Moskowitz, 2005, Do liquidation Values Affect Financial Contract? Evidence from Commercial Loan Contracts and Zoning Regulation. Quarterly Journal of Economics. 120, 1121-1154.

[9] Boudry, W., Kallberg J. and Liu. C, An Analysis of REIT Security Issurance Decisions, Real Estate Economics, Forthcoming 2009

[10] Brown, D.T., Liquidity and Liquidation: Evidence from Real Estate Investment Trust. Journal of Finance 55: 469-485

[11] Brown, David T. and Riddiough, Timothy J., Financing Choice and Liability Structure of Real Estate Investment Trusts. Real Estate Economics, Forthcoming.

[12] Casey, Sumner, and Packer, M.F., REIT capital structure: is it market imposed? Managerial Finance Vol 32 No 12 PP 981-987

[13] Dow, James and Rossiensky, Nathalie, The Cost of Debt for a Financial Firm(November 1998)

[14] Fama E.F., K.R. French, (2002) "Testing Tradeoff and Pecking Order Predictions About Dividends and Debt", Review of Financial Studies, Vol. 15, Iss. 1, pp. 1-43.

[15] Feng, Z., Ghosh, C., & Sirmans, C. F., 2007, On the capital structure of real estate investment trusts. Journal of Real Estate Finance and Economics, 34(1), 81–105.

[16] Fisher, E.O., Heinkel, R., and Zender, J. Dynamic capital structure choice: theory and test, Journal of Finance 44, 19-40

[17] Flannerya and Rangan, 2006, Journal of Financial Economics, Volume 79, Issue 3, March 2006, Pages 469-506

[18] Friend I., L.H.P. Lang, (1988) "An empirical test of the impact of managerial self-interest on corporate capital structure", Journal of Finance, Vol. 43, pp. 271-281.

[19] Frye, 2000a, Collateral damage detected, Federal Reserve Bank of Chicago, Working Paper, Emerging Issues Series, October.

[20] Frye, 2000b, Depressing recoveries, Risk 13(11), 108-111.

[21] Giambona, Harding, and Sirmans, 2008, Explaining the Variation in REIT Capital Structure: The Role of Asset Liquidation Value. Vol. 36 Issue 1, pp111–137

[22] Highfield, Michael J., Roskelley, Kenneth and Zhao, Fang, 2007, The Determinants of the Debt Maturity Decision for Real Estate Investment Trusts. Journal of Real Estate Research, Vol. 29, No. 2

[23] Hovakimian, Opler, and Titman, 2001, The Debt-Equity Choice, Journal of Financial and Quantitative Analysis, Vol. 36, No. 1.

[24] Hu and Perraudin, 2002, The dependence of recovery rates and defaults, Working paper, Birkbeck College.

[25] Hung, Albert, and Eddie, 2002, Capital structure and profitability of the property and construction sectors in Hong Kong. Journal of Property Investment and Finance, Volume 20, Number 6, 2002 , pp. 434-453(20)

[26] Kaplan, S.N., 1989, Campeau's acquisition of federated: Value destroyed or value added? Journal of Financial Economics 25, 191-212.

[27] Kayhan and Titman, 2007. Firms' Histories and Their Capital Structures, Journal of Financial Economics, 83, 1-32.

[28] Kiyotaki, N. and Moore, J., 1997. Credit cycles. Journal of Political Economy 105, 211–248

[29] Korajczyka and Levy, 2003, Capital structure choice: Macroeconomic conditions and financial constraints, Journal of Financial Economics, Vol. 68, Pages 75-109

[30] Kraus and Litzenberger, 1973, A State-Preference Model of Optimal Financial Leverage, Journal of Finance, pp. 911-922.

[31] Lewellen, 2006, Financing decisions when managers are risk averse, Journal of Financial Economics, Volume 82, Issue 3, December 2006, Pages 551-589

[32] MacKie-Mason, Jeffrey K., 1990, Do Taxes Affect Corporate Financing Decisions?. The Journal of Finance, Vol. 45, No. 5, pp. 1471-1493

[33] Maris and Elayan, 2003, Capital Structure and the Cost of Capital for Untaxed Firms: The Case of REITs Real Estate Economics Vol 18 NO: 1 PP 22-39

[34] Modigliani, F. and Miller, M., The cost of capital, corporation finance, and the theory of investment, American Economic Review 48, 655-669

[35] Myers, Stewart C., 1984, The capital structure puzzle, Journal of Finance 39, 575-592

[36] Myers, Stewart C. and Nicholas S. Majluf, 1984, Corporate Financing and Investment Decisions When Firms Have InformationThat Investors Do Not Have, Journal of Financial Economics 13, 187–222

[37] Ooi, 1999, The determinants of capital structure Evidence on UK property companies, Journal of Property Investment and Finance, Volume 17, Number 5, 1999, pp. 46-48(3)

[38] Rajan R.G., L. Zingales, (1995) "What do we know about capital structure? Some evidence from international data", The Journal of Finance, No. 50, pp. 1-58.

[39] Saeed A., (2007) "The Determinants of Capital Structure in Energy Sector", Blekinge Institute of Technology School of Management, Master's Thesis in Business Administration, pp. 1-43.

[40] Shleifer and Vishny, 1992, Liquidation values and debt capacity: A market equilibrium approach, Journal of Finance, 1992, vol. 47, issue 4, pages 1343-66

[41] Titman, 1983, The effect of capital structure on a firm's liquidation decision, Journal of Financial Economics Vol 13, Issue 1 March 1984, PP 137-151

[42] Vasiliou D., N. Eriotis, N. Daskalakis, (2003) "The Determinants of Capital Structure: Evidence From The Greek Market", paper presented at the 2nd Annual Meeting of Hellenic Finance and Accounting Association, Athens, Greece, pp. 1-16.

Table 1: Predicted Effects on the Probability of Debt Issues

This table presents the predicted effects of various factors on the probability of new debt issues. These factors are motivated by existing theoretical and empirical studies on capital structure.

	Data Source	Predicted Effect on Debt Issue
Liquidation value		
Average lease term	SNL	+
Capitalization rate	CoStar	−
CMBS loss severity	LB and S&P	−
Trade-off Theory		
Market leverage	SNL/Compustat	−
Pecking order theory		
ROAA	SNL/Compustat	−
ROAE	SNL/Compustat	−
ROACE	SNL/Compustat	−
Market timing		
Market-to-book	SNL/Compustat	−
Others		
log(Book Assets)	SNL/Compustat	+
FFO growth	SNL/Compustat	−
Dilution	NAREIT	+

Table 2: Summary Statistics on New Issues of REITs

This table presents the summary statistics of new bond and equity issues of REITs by property focus. The sample period is between January 2000 and April 2009. The data involve all new security issues available from NAREIT and SNL, complemented when possible by SDC and DealScan.

	Total	Debt Offerings					Equity Offerings				
	Firm	$\bar{N}$	N	Size ($million)			$\bar{N}$	N	Size ($million)		
	Number	Issues	Firms	Mean	Median	Stdev	Issues	Firms	Mean	Median	Stdev
Diversified	13	5.5	4	701	564	344	2.6	13	740	760	356
Health Care	12	4.1	8	652	632	163	4.9	11	624	525	233
Industrial	10	7.0	6	849	745	334	4.7	10	549	476	214
Industrial/Office	13	5.6	5	951	841	346	2.7	12	591	489	251
Lodging	13	3.5	4	826	733	187	4.4	13	508	459	231
Office	23	6.5	15	1125	1019	446	4.0	18	559	528	247
Residential	23	5.5	16	726	695	229	4.0	18	631	563	252
Retail	41	6.0	26	739	625	330	5.0	32	548	530	238
Self Storage	4	2.0	3	509	565	142	6.5	4	787	809	186
Specialty	4	2.0	2	563	530	80	7.0	4	525	530	81

Table 3: Summary Statistics of Dependent and Independent Variables

This table presents the sample mean and sample standard errors of the dependent and independent variables in our regression analysis for REITs' new debt and equity offerings over the period of January 2000 to April 2009.

	Debt Offerings		Equity Offerings		
	Mean	Stdev	Mean	Stdev	t-stat
Measures of Liqudation Value:					
Weighted Lease Term	5.209	1.594	4.494	2.448	5.75***
Capitalization Rate	9.523	0.502	9.769	0.760	-6.33***
Historical Loss Rate	0.349	0.164	0.403	0.172	-5.34***
Other Financial Ratios:					
log(Book Assets)	6.629	0.409	6.285	0.432	13.40***
Market leverage	0.435	0.096	0.449	0.164	-1.66*
FFO growth	0.170	0.482	0.178	0.567	-0.26
Dilution	0.076	0.077	0.109	0.180	-4.02***
ROAA	4.046	2.753	4.130	5.636	-0.32
Market-to-book	1.235	0.283	1.175	0.286	3.43***
Number of Firms	491		581		

Table 4: Logit regression analysis of financing decisions

This table presents the logit regression results of REITs' incremental financing decisions. The dependent variable is set to 1 for a new bond issue, and 0 for an equity issue. Liquidation value is measured by three different variables, namely the weighted average lease term (in number of years), the cap rate, and the historical CMBS loss severity, which correspond to the three columns in the table. Market leverage is the ratio of total debt to total market assets, where the market assets is the total book assets plus the difference between the market value of equity and the book value of equity. FFO growth is the annual percentage change in funds from operations. Dilution is the total amount of offering divided by the market value of equity prior to the new issue. Profitability is measured by the ROAA, the return on average assets. Market-to-book is the total book assets divided by the total market value of assets. t-statistics are shown in parentheses. The percentage next to each coefficient is the change in the probability of issuing bonds when the corresponding explanatory variable increase by one standard deviation. *, **, and *** indicates statistical significance at the 10%, 5%, and 1% levels, respectively.

(Continued on the next page)

Table 4: Continued

	Model (1)		Model (2)		Model (3)	
Wght. avg. lease	0.146***	7.52%				
	(3.009)					
Cap rate			-0.384**	-5.88%		
			(-2.320)			
Loss severity					-0.032***	-12.3%
					(-5.429)	
log(Book Assets)	2.921***	25.0%	2.882***	30.9%	3.137***	33.5%
	(8.139)		(7.981)		(8.415)	
Market leverage	-9.279***	-30.8%	-9.261***	-28.6%	-9.570***	-29.5%
	(-6.876)		(-6.884)		(-6.896)	
FFO growth	0.003	0.10%	-0.048	-0.49%	-0.055	-0.62%
	(0.016)		(-0.272)		(-0.310)	
Dilution	2.171***	8.14%	2.134***	8.15%	2.293***	8.72%
	(3.799)		(3.725)		(4.021)	
Profitability	-0.010	1.13%	-0.010	-1.08%	-0.011	-1.24%
	(-0.568)		(-0.539)		(-0.597)	
Market-to-book	-1.176**	-7.53%	-1.258***	-8.18%	-1.064**	-6.88%
	(-2.487)		(-2.606)		(-2.154)	
Intercept	-13.872***	–	-9.141***	–	-13.350***	–
	(-6.700)		(-3.216)		(-6.375)	
Firm dummy	Yes		Yes		Yes	
Likelihood	-515.4		-517.3		-504.4	
Adjusted R^2	0.392		0.389		0.410	
Sample Size	1072		1072		1072	

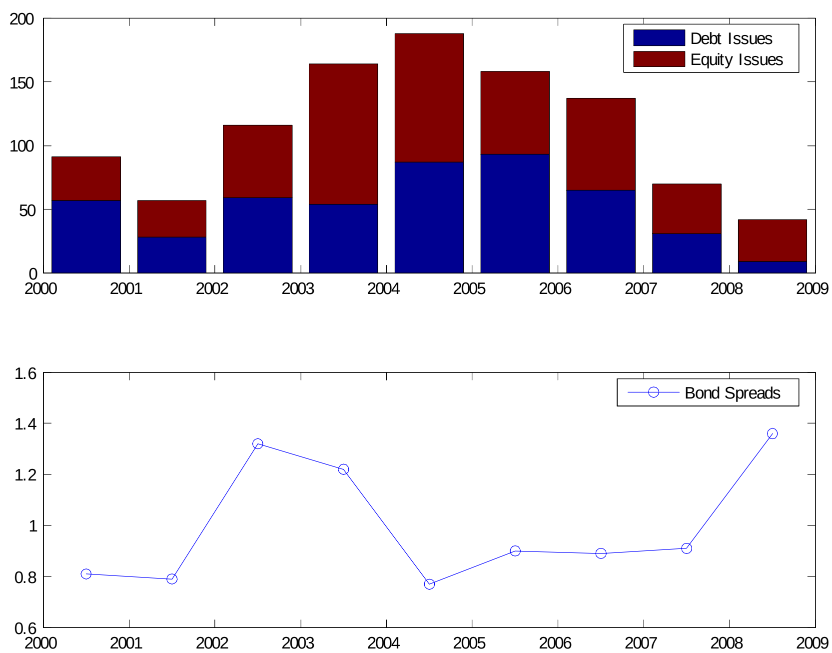

Figure 1: Distribution of new issues and bond spreads by year. The upper panel shows the number of REITs' new issues by year of issuance. The lower panel illustrates the average bond spreads between Moody's BBB- and AAA-rated bonds over the same period.