Secured Debt and Corporate Performance: Evidence From REITs

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Abstract

Agency theory in modern corporate finance suggests the presence of a conflict of interest between managers and shareholders. Prior theoretical and empirical research has identified leverage as an important mechanism that is likely to mitigate agency costs. Although debt plays a central role in mitigating corporate agency conflicts, relatively few studies have examined the implications that arise from the use of secured versus unsecured debt. Given the differences that exist in the incentives to engage in costly monitoring activities between secured and unsecured debt holders, we explore the role of secured and unsecured debt as monitoring devices. Specifically, we answer the following question: Does the use of unsecured debt result in a performance difference between firms that employ a higher proportion of unsecured debt versus firms that utilize secured debt? We find robust evidence that an increase in the use of secured debt by REITs is associated with positive excess returns in the following quarter.

Introduction

The current crisis in the credit markets raises a number of interesting questions regarding the use of debt by corporations. One aspect that has generated a number of conflicting theories in the academic literature is the use of collateral in debt contract. A number of competing theories have developed surrounding the use of collateral (or secured) debt by firms.

Collateral is often associated with models based on adverse selection or moral hazard. In adverse selection models, borrowers use collateral to signal quality – suggesting that less risky firms are willing to utilize secured debt (Bester, 1985; Chan and Kanatas, 1985; Besanko and Thakor, 1987a, b). Furthermore, moral hazard models assume that the use of collateral improves the incentives for borrowers to work hard to repay debt (Chan and Thakor, 1987; Boot and Thakor, 1994). Overall, these models of debt choice based on adverse selection and moral hazard point to secured debt as being associated with less riskier firms.

In contrast, recent theoretical models call into question the assumption that less risky borrowers prefer collateral. For example, the model developed in Boot, Thakor, and Udell (1991) finds that risky borrowers will utilize more collateral when borrower quality is observable and moral hazard is present. Most recently, Inderst and Mueller (2007) present a model showing that observably riskier borrowers should pledge more collateral and that, holding observable borrower risk constant, secured loans will be more likely to default ex post. Interestingly, Inderst and Mueller (2007) obtain their result without appealing to assumptions regarding the presence of moral hazard or adverse selection.

In this paper, we empirically test these competing theories regarding the use of secured debt. In order to directly test whether secured debt alleviates the problems associated with adverse selection and moral hazard, we make use of the fundamental principle in finance that riskier assets must generate higher expected returns. Specifically, we answer the following questions: Does the use of unsecured debt result in a performance difference between firms that employ a higher proportion of unsecured debt versus firms that utilize secured debt? Furthermore, if secured debt does alleviate moral hazard and adverse selection issues, then does the effectiveness of monitoring through secured debt increase during credit crises periods?

In order to empirically test these theories, we rely on the unique features of the capital structure of real estate firms. For real estate firms or real estate investment trusts, the choice of secured or unsecured debt is highly material. Unlike other corporations, REITs possess tangible assets that are easy to collateralize. Other firms, particularly those that do not own tangible assets, do not have assets to pledge as collateral in the first place. Furthermore, REITs are tax transparent, thus avoiding the controversy over the relationship between corporate tax rates and utilization of secured debt.[1] Thus, we propose a novel test of the competing theories regarding the use of secured or unsecured debt using changes in debt choice by REITs.

To preview our results, we find strong evidence for the relationship between changes in the use of secured debt and subsequent performance. At the one-month, one-year and three-year holding period horizons, we find that an increase in the use of secured debt is associated with positive excess stock returns. For example, the results indicate that

[1]According to DeAngelo and Masulis (1980), firms facing higher tax rates should issue more debt. Therefore, firms with higher tax rates should issue the lowest priority and hence most risky debt claims in order to increase the value of their tax shield.

a 1 percent increase in secured debt over the previous year implies that the 1-year holding period return is 3.5 basis points higher than the 1-year holding period return of the REIT that did not alter its use of secured debt (holding all else, including total leverage, constant.) Furthermore, during a credit crisis (the 2001 recession), a 1 percent increase in the use of secured debt corresponds to a 41.1 basis point increase in the 1-year holding period return.

Our paper is structured as follows. In the next section, we outline the previous literature that examines the use of unsecured and secured debt, and the factors that determine corporate debt choice. In Section 3, we describe the data and empirical method employed in the analysis. In Section 4, we present the results of our analysis, and in Section 5 we conclude.

Literature on Secured versus Unsecured Debt

Although debt plays a central role in mitigating corporate agency conflicts, relatively few studies have examined the implications that arise from the use of secured versus unsecured debt. Unsecured debt refers to general obligation bonds and secured debt refers to debt collateralized by specific assets. Investors in secured and unsecured debt look to the firm's cash flow for payment of interest and principal. However, in bankruptcy, unsecured debt holders have a general claim on the firm's assets whereas secured debt holders have specific corporate assets that can be sold to recover any losses and these claims take precedence over the unsecured creditors' claims on the firm's assets. As a result, unsecured creditors have greater incentives to engage in monitoring activities than secured creditors.

The customary justification for secured debt is that issuing collateral helps reduce borrowing costs through a reduction in the lender's administration costs and increasing the costs associated with default (Barro, 1976; Benjamin, 1978). First, collateral helps reduce administrative and enforcement costs because the lender holds title to the pledged asset and can thus quickly sell the asset to cover loan losses associated with borrower default. Secured debt also helps lower screening costs for creditors because they do not have to concern themselves with the firm's other assets since their interests are protected by the pledged assets (Shah and Thakor, 1987). Second, since pledged assets cannot be disposed of easily, secured debt lowers total costs of borrowing by limiting asset substitution opportunities. Consequently, financing new projects with secured debt also helps alleviate the underinvestment problem associated with risky debt. As the cost of borrowing is lower for debt with security provisions, the firm can undertake projects that it would have otherwise foregone if using normal debt (Stulz and Johnson, 1985; Berkovitch and Kim, 1990). Thus, since the interest rate charged on secured debt is lower than that of unsecured debt, firms should issue as much secured debt as possible.

Such rationalization is, however, one sided because it ignores the costs involved in issuing secured debt (Scott, 1977). First, the costs of establishing secured debt contracts are more expensive than normal debt contracts because of additional reporting requirements (Smith and Warner, 1979a). Second, collateralizing a loan leads to a loss of flexibility with respect to use and sale of the pledged asset (Stulz and Johnson, 1985). Third, a moral hazard problem may arise due to the divergence of interest between the borrower and lender with regard to maintaining the value of the pledged asset (Igawa and Kanatas, 1990). Fourth, while issuing secured debt may alleviate the under-investment

problem, the lower cost of borrowing may create an incentive towards excessive investment (Berkovitch and Kim, 1990). Thus, the firm's decision to utilize collateralized debt depends on the trade-off between the benefits and costs of securing the debt (Smith and Warner, 1979a). Naturally, secured loans will only be issued if the benefits of doing so exceed the costs.

However, in an efficient capital market, the debt seniority decision is inconsequential to the value of a firm. Fama and Miller (1972), for example, contend that a firm cannot alter the total value of its outstanding securities by issuing or retiring any type of security if the securities are protected against financing actions that would reduce their value without adequate compensation. The notion of perfect information implies that unsecured creditors, who necessarily take on greater risk, will demand higher interest rates to compensate for the smaller pool of assets available to satisfy their claims. In equilibrium, the collateral pledged provides no net benefits to the firm and total interest costs should be unaffected by the existence of collateral (Fama, 1978; Schwartz, 1981). In the search for a meaningful existence of secured debt, researchers have relaxed the rigid assumptions associated with perfect markets. For example, recent studies by Jiminez and Salas (2004) and Inderst and Mueller (2007) have examined the role of collateral in an imperfectly competitive loan market. In their model, collateral mitigates incentive problems on the part of the lender.[2]

Theoretical models have assumed agency problems on the part of the borrower. Bester (1994), for instance, illustrates a situation where a borrower is motivated to default

[2] Holding local market competition constant, the Inderst and Mueller (2007) model predicts that observably riskier borrowers should pledge more collateral and that, holding observable borrower risk constant, collateralized loans are more likely to default ex post. The above two predictions, however, do not follow from existing models of collateral.

(even though the underlying project is a success) because of the chance of gaining debt forgiveness. The motivation to cheat, however, is reduced if collateral is posted. Hence, collateral in the Bester model protects creditors against cheating by borrowers. Besides resolving the moral hazard problem, theoretical models of secured debt have also assumed that collateral reduces potential adverse selection problems in the presence of asymmetric information (Smith and Warner, 1979a; Chan and Thakor, 1987). The underlying premise in these models is the inability of the lenders to distinguish between good and bad borrowers. Consequently, an interest rate that reflects the average quality of borrowers in the market results in an under-pricing of low quality firms but an over-pricing of high quality firms. As a result, high quality firms do not have incentives to enter the market leading to an adverse selection situation. Under such conditions, secured debt can play a role in signaling the real worth of a firm. In the model of Chan and Kanatas (1985), collateral functions as a credible signaling device. In the case of a high quality project, the borrower offers more collateral because of the low probability of default. High risk projects, on the other hand, have a higher chance of failure and consequently, the prospect of the collateral being forfeited is also higher. Thus, the borrower has to balance the gains (in the form of lower interest rates) against the prospect of losing the collateral in the event of default.

Examining the role of collateral from the lender's perspective, the credit rationing models of Bester (1985) and Besanko and Thakor (1987) prescribe that lenders can sort borrowers into risk classes by designing credit contracts with inversely related interest rates and collateral requirements. As opposed to the conventional wisdom that high-risk firms have to issue collateral in order to attract creditors, their models prescribe that high

risk borrowers will opt for contracts with high interest rates and low collateral requirements. Low risk borrowers, on the other hand, will choose contracts with low interest rates and high collateral requirements.

In summary, the use of collateral can be rationalized on the grounds that it helps to resolve moral hazard and adverse selection problems. The adverse selection models predict that low-risk borrowers will pledge more collateral. Likewise, the moral-hazard models are also based on the premise that posting collateral improves borrowers' incentives to work hard, thereby reducing their likelihood of default.

In contrast, Boot, Thakor and Udell (1991) find that high risk borrowers may pledge more collateral and hence, collateralized loans may be riskier ex post. Furthermore, Inderst and Muller (2007) suggest that if borrower quality and effort are substitutes, low-quality borrowers post collateral to commit to higher effort. Although the use of secured debt has theoretical support for resolving moral hazard and adverse selection problems, the relation between firm utilization of secured debt and future stock performance is less clear.

Despite the wealth of theories on the economic relevance of secured debt, only a few studies have examined empirically the factors determining corporate secured debt choice. For example, Leeth and Scott (1989) find that the probability of using a secured loan is positively related to the likelihood of default, loan size, loan maturity and marketability of assets, and is also dependent on changes in the economic and legal environment. Barclay and Smith (1995a) argue that a firm with more growth opportunities should have a greater proportion of its long-term liabilities in senior claims

such as capitalized leases or secured debt.[3] However, they did not find any significant relationship between growth opportunities and secured debt. Chang et al (2007) observe a significantly positive relationship between a firm's investment opportunities and its stock price response to announcements of secured debt issues. They interpret the results to support the "investment opportunities" hypothesis, i.e. *secured debt financing is more valuable for issuing firms with high growth opportunities.* However, they do not compare the long-term performance of firms based on their debt choice.

To summarize, the literature points to two competing hypotheses regarding the relation between secured debt and firm stock performance. First, models associated with adverse selection and moral hazard suggest that firm risk should be negatively associated with the use of secured debt. That is, less risky firms are more willing to use secured debt than risky firms. In contrast, recent models focusing on borrower effort imply that higher risk borrowers will utilize secured debt. Thus, these theories point to contrasting empirical hypotheses regarding the relation between the use of secured debt and firm risk. Since modern financial theory clearly links firm risk with expected returns, that is, higher risk firms should earn higher returns, then it follows that we should see a negative relation between an increase in the usage of secured debt and the firm's long-term stock performance if the adverse selection and moral hazard theories of debt usage are correct. However, a positive relation between stock performance and the use of secured debt is consistent with the collateral signaling models. In the next section, we outline a simple empirical test of these competing hypotheses.

[3]The agency costs associated with asset substitution and underinvestment are likely to be more serious for firms with higher growth options in their investment opportunity sets since they have more flexibility in their choice of future investments (Titman and Wessels, 1988; Barclay and Smith, 1995a,b).

Data and Research Design

We examine all equity REITs having information reported in the SNL database and security prices in the Center of Research in Security Prices (CRSP) database. After filtering for obvious errors or incomplete information, we collected financial information and stock prices for 114 publicly traded REITs spread over 73 quarters (1990Q1 to 2008Q2). Because some key accounting data where not recorded in the data during the early years of the sample, the sample used for estimation is effectively reduced to the period 1992Q2 to 2007Q4.

To isolate the collateralization decision from leverage decision, we normalize the amount of secured debt (*SecDebt*) employed by a firm by its total debt. We measure the quarterly change in the secured debt as:

$$\partial SecDebt = SecDebt_t - SecDebt_{t-1}$$

Table 1 presents the descriptive statistics of *SecDebt* as well as several other firm attributes of the final sample (number of observations, debt ratio, secured debt ratio, return on assets, and price-FFO ratio). Growth opportunities are proxied by the price-to-funds from operations (FFO) with a higher price multiplier representing more growth opportunities. Firm profitability is measured by the return on assets (ROA). As evident in Table 1, the sample size changes dramatically over the study period. The number of REITs in the sample increases from a low of 21 in the first quarter of 1992 to 108 in 2006 and 2007. Furthermore, secured debt is on a downward trend during the sample[4]. This contrasts with the amount of leverage used by firms (debt ratio), which has generally been increasing over this time. This trend is more evident in Figure 1, which shows the

[4] We do not include the 100% observation in 2008 in making this claim, as information is only available for two companies in this period.

cross-sectional mean of the secured debt ratio and leverage ratio on a quarterly basis over the sample period. Figure 1 shows the declining average secured debt ratio and the corresponding increase in leverage.

Table 2 presents the mean and median returns over 1-month, 3-month, 1-year and 3-year holding periods for the full sample as well as sub-samples of the REITs, partitioned by the change in their secured debt ratio. 44.6% of the observations experienced a reduction, 31.2% experienced an increase, and 24.2% did not see any change in their secured debt ratios over the previous quarter. The overall pattern in Table 2 suggests that REITs in the first category tend to pose below average returns, whilst REITs in the second category tend to register above average returns. This observation is consistent with a positive relationship between change in secured debt ratio and firm stock performance.

To formally test the competing hypotheses concerning the relation between secured debt use and firm stock performance, we estimate an OLS regression to identify the determinants of stock performance with the key variable of interest being the level of secured debt employed by the individual firm. Specifically, we estimate the following equation:

$$\begin{aligned} r_{t+j,i} = \alpha + \gamma_l \sum_{l=1}^{11} DUM^{l}_{i} + \beta_1 \partial SecDebt_{t,i} + \beta_2 \ln(size_{t,i}) \\ + \beta_3 price\_FFO_{t,i} + \beta_4 ROA_{t,i} + \beta_5 debt\ ratio_{t,i} \\ + \beta_6 Beta_{t,i} + \beta_7 Age_{t,i} + \beta_8 \text{Re}\, cession \\ + \beta_9 UPREIT_{i} + \beta_{10} SelfMgt_{i} + \beta_{11} SelfAdv_{i} + e_{t,i} \end{aligned} \qquad (1.)$$

where $r_{t+j,i}$ is the continuously compounded holding period return for REIT *i* from quarter *t* to *t+j* (*j*=1-month, 3-months, 1-year, and 3-years), and $\partial SecDebt$ is the annual (four quarter) change in the secured debt ratio in quarter *t* for REIT *i*. In equation (1), we

control for firm size by including the natural log of REIT i's market capitalization in quarter *t* ($\ln(size_{t,i})$). Chan and Kanatas (1985) suggest that smaller firms, with less information available to lenders, may use more secured debt to signal their project quality. Smith and Warner (1979) also argue that smaller firms use secured debt more frequently because they have a higher probability of liquidation. Both of these models imply that the use of secured debt may be associated with firms having growth opportunities. Since growth opportunities are correlated with future stock price performance, we include the ratio of REIT *i*'s funds from operations (FFO) to its stock price in quarter *t* ($price\_FFO_{t,i}$) in order to control for differences in growth opportunities. Since future stock price performance also reflects the firm's profitability and use of leverage, we include as control variables $ROA_{t,i}$, REIT *i*'s return on assets in quarter *t*, $Debt\_Ratio_{t,i}$, the debt asset ratio for REIT *i* in quarter *t*, $RISK_{t,i,}$ the systematic risk for REIT *i* in quarter *t* and DUM^{l}_{i}, a dummy variable capturing REIT *i*'s property sector.[5] In addition, we add three more dummy variables capturing the REIT's organization structure, namely UPREIT status (*UPREIT*), self-managed (*SelfMgt*) and self-advised (*SelfAdv*).Finally, to test for the impact of a credit crisis on the use secured debt, we include a dummy variable *Recession* to denote the 2001 recession. Table 3 summarizes the variable names and definitions.

Results

We begin the analysis by examining the within firm variation in the secured debt ratio (*SecDebt*). Figure 2 displays the scatter plot of the average secured debt ratio and

[5] The sectors covered include diversified, healthcare, hotel, industrial, manufactured homes, multi-family, office, regional mall, retail other, storage space, shopping center, and specialty retail.

the within firm standard deviation of the secured debt ratio fitted with a second order polynomial trend line. The idea behind this presentation is to see if variations in the secured debt ratio are common or if firms rarely adjust this ratio. It is clear from Figure 2 that a small number of firms target a particular secured debt ratio and do not change this ratio (note the low volatility around 0% and 100%). However, we do see a large number of firms that exhibit wide variations in this ratio. The second order polynomial trend line displays an inverted U-shape suggesting the highest shifts in secured debt use occur at the 50 percent secured debt ratio.

We now turn to a formal analysis of the impact of changes in the use of secured debt on firm stock performance. Table 4 reports the coefficients from the estimation of equation (1). The results show weak evidence for the relationship between secured debt and subsequent performance at the one-month holding period horizon with the coefficient for change in the secured debt ratio being positive and significantly (at the 10 percent level). The coefficient for $\partial SecDebt$ implies that a 1 percent increase in the use of secured debt corresponds to a 5.2 basis point increase in the 1-month holding period return. The results, however, show no evidence of significant relationship between secured debt and subsequent long-term performance. In particular, the coefficients for $\partial SecDebt$ are not statistical significant for the three-month, 1-year and 3-year holding periods.

Table 4 shows that the debt ratio is significantly positive over each horizon period. Consistent with the additional risk associated with higher leverage, we see that REITs with higher debt ratios have consistently higher future holding period returns. We also see that the systematic risk of the firm is weakly significant in the 1-month holding

period return regression. Not surprising, accounting profits (ROA) and stock performance are related positively and the relationship is statistically significant in two of the cases. Firm age is also positively related to stock performance. The lack of significance for the price to FFO variable implies that stock returns are not correlated with current period valuations. Consistent with the literature, firm size is negatively related with future stock returns up to one year holding period. Beyond the one year holding period, firm size and future stock returns are positively related. The results also show that UPREITs and REITs that are externally managed tend to perform poorly.

Robustness Test

One concern with the results reported in Table 4 is that the use of secured debt may be endogenous to factors associated with future stock performance. To control for this possibility, we estimate a two-stage regression model that incorporate the potential for REIT past performance to impact its shift in the use of secured debt. Specifically, we estimate the following first-stage regression of the change in the secured debt ratio ($\partial SecDebt_{t,i}$):

$$\begin{aligned}\partial SecDebt_{t,i} = {} & \alpha + \gamma_t \sum_{l=1}^{11} DUM^{l}_{i} + \beta_1 + \beta_2 \ln(size_{t-1,i}) \\ & + \beta_4 ROA_{t-1,i} + \beta_5 Debt\_Ratio_{t,i} + \beta_6 UPREIT \\ & + \beta_7 SelfMgt + \beta_8 SelfAdv + \delta X_i + e_{t,i}\end{aligned} \qquad (2.)$$

where X_i represents a series of year dummy variables to capture any time-varying effects over the study period. In this specification, the change in the secured debt ratio is regressed on the firm's size and return on assets in quarter *t-1*. The residuals from the

OLS estimation of (2) are then used in the following second-stage regression:

$$
\begin{aligned}
r_{t+j,i} = \alpha + \gamma_l \sum_{l=1}^{11} DUM^{l}_{i} + \beta_1 \partial \overline{SecDebt}_{t,i} + \beta_2 \ln(size_{t,i}) \\
+ \beta_3 price\_FFO_{t,i} + \beta_4 ROA_{t,i} + \beta_5 debt\ ratio_{t,i} \\
+ \beta_6 Beta_{t,i} + \beta_7 Age_{t,i} + \beta_8 \text{Re}\, cession \\
+ \beta_9 UPREIT_{i} + \beta_{10} SelfMgt_{i} + \beta_{11} SelfAdv_{i} \\
+ \beta_{12} \text{Re}\, cession * \partial \overline{SecDebt}_{t,i} + e_{t,i}
\end{aligned}
\qquad (3.)
$$

where $\overline{\partial SecDebt_{t,i}}$ represents the change in secured debt ratio residuals from the estimation of equation (2). In this framework, $\overline{\partial SecDebt_{t,i}}$ is the REIT's deviation from the expected change in the secured debt ratio given its profitability and firm characteristics at each quarter. Thus, $\overline{\partial SecDebt_{t,i}}$ corresponds to the unexpected shift in use of secured debt. Under the hypothesis that secured debt alleviates the underinvestment problem, then a positive increase in the use of secured debt above the general trend in secured debt usage should correspond to a positive future stock performance. Furthermore, in order to assess whether firms differentially switch debt types during the recession, we interact the change in the secured debt ratio ($\partial SecDebt$) with the recession dummy variable.

Table 5 reports the estimation results for the first stage OLS regression of equation (2). Interestingly, debt ratio has a negative and significant impact on REITs' usage of secured debt. Firm size, on the hand, is related positively to the use of secured debt. Both results are contrary to the argument that small firms with high leverage tend to depend more on secured debt when raising external debt. However, we do see that UPREITs are more likely to increase their use of secured debt and differences in the use of secured debt exist across property sectors as REITs that focused on shopping centers

and specialty properties are less likely to increase their use of secured debt. Profitability (ROA), however, does not have a significant impact on the firm's decision to alter its secured debt ratio.

Turning to the second stage model, Table 6 reports the results for the estimation of equation (3). This model includes the residual from the estimation of equation (2) as a measure the impact of deviations from expected changes in the use of secured debt. Comparing the results with Table 4 (equation 1), we again find that REITs with higher debt ratios have consistently higher future holding period returns. Although REITs with higher current period valuations (price-to-FFO) have lower future holding period returns, the coefficients are not statistically significant. The coefficients for the other variables in the model also behave as reported in Table 4. Again, we note that the estimated coefficient for $\overline{\partial SecDebt_{t,i}}$ is only statistically significant for the 1 month holding period horizon. Thus, the reported results are robust despite the potential endogeneity problem.

Conclusion

Agency theory in modern corporate finance suggests the presence of a conflict of interest between managers and shareholders in firms and prior research has identified leverage as an important mechanism that is likely to mitigate these agency costs. Given the differences that exist in the incentives to engage in costly monitoring activities between secured and unsecured debt holders, we explore the impact of the use of secured and unsecured debt on future stock price performance.

Using a sample of REITs, we find strong evidence for the relationship between the use of secured debt and subsequent stock price performance. The estimated

coefficients from a regression of future holding period returns on variables associated with the use of secured debt indicate that a 1 percent increase in the use of secured debt corresponds to a significant 5.2 basis point increase in the 1-month holding period return, after controlling for the use of leverage, size, property segment, profitability, and current quarter pricing ratio.

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Table 1: Description of Sample (1992-2007)

Year	Number of REITS	Secured Debt Ratio	Debt - Asset Ratio	ROA	Price FFO Ratio
1992	21	75.30	0.33	4.87	9.31
1993	28	75.17	0.38	4.25	14.62
1994	43	79.84	0.38	9.10	12.59
1995	58	70.11	0.42	4.77	10.56
1996	65	74.83	0.42	3.91	11.03
1997	68	70.36	0.41	4.47	12.26
1998	76	58.75	0.42	4.18	12.43
1999	81	58.80	0.48	3.59	8.57
2000	86	59.73	0.49	3.67	7.92
2001	84	62.35	0.50	3.91	8.56
2002	86	63.41	0.51	3.32	10.69
2003	86	62.01	0.53	3.04	10.11
2004	87	62.56	0.50	3.03	15.95
2005	107	67.19	0.51	3.38	14.14
2006	108	64.42	0.53	3.61	16.25
2007	108	62.24	0.54	3.26	17.39

Table 2: Relationship between Changes in Secured Debt Ratio and Stock Performance

$\partial SecDebt$ refers to change in Secured Debt Ratio over the preceding quarter. Ret1m, Ret3m, Ret1y and Ret3y refer to 1-month, 3-months, 1-year, and 3-year holding period returns.

	ALL		$\partial SecDebt < 0$		$\partial SecDebt = 0$		$\partial SecDebt > 0$	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Ret1m	0.94%	0.97%	0.83%	1.06%	1.02%	0.78%	1.03%	1.10%
Ret3m	4.43%	4.35%	4.57%	4.71%	4.96%	3.92%	3.81%	4.22%
Ret1y	16.85%	15.91%	15.82%	15.54%	19.38%	15.97%	16.36%	16.71%
Ret3y	65.99%	59.20%	60.51%	55.39%	69.85%	62.32%	70.46%	63.83%

Table 3: Definitions of Explanatory Variables

Independent Variables	**Symbol**	**Definition of Proxies**
Secured Debt Ratio	$SecDebt_{t,i}$	Secured debt over total debt.
$\partial SecDebt$	$\partial\ SecDebt_{t,i}$	Change in Secured Debt ratio over the preceding quarter.
Firm Size	$Ln(size_{t,i})$	Natural logarithm of the market capitalization.
Leverage	$Debt\_Ratio_{t,i}$	Total debt as a percentage of total capitalization.
Growth opportunities	$Price\_FFO_{t,i}$	Common stock price at the end of the period as a multiple of the annualized FFO per share.
Profitability	$ROA_{t,i}$	Return on average asset, which is calculated as net income a percentage of average assets (annualized).
Systematic Risk	$Beta_{t,i}$	Systematic risk of the individual REIT, computed over a rolling window of 60 months.
Age	$IPO\ Age_{t,i}$	Age of the firm, calculated from the date of firm's initial public listing date.
Property Focus	$\sum_{l=1}^{11} DUM_i^l$	1=diversified, 2=healthcare, 3=hotel, 4=industrial, 5=manufactured homes, 6=multi-family, 7=office, 8=regional mall, 9=retail other, 10=storage space, 11=shopping center. Note that the default category is specialty properties.
Partnership	$UPREIT_{t,i}$	Binary variable equals one if the individual REIT is structured as an operating partnership.
Management	$Self\text{-}Managed_{t,i}$	Binary variable equals one if the individual REIT is internally managed.
Advisor	$Self\text{-}Advised_{t,i}$	Binary variable equals one if the individual REIT does not engage external advisor.

Table 4: Determinants of REIT performance (Equation 1)
(Dependent variable is 1-month, 3-month, 1-year, and 3-year holding period returns. Standard errors in parentheses.)

Variable	1 month	3 month	1 year	3 year
Intercept	-0.03596	-0.00745	-0.00745	-0.22808
	(0.02745)	(0.04532)	(0.04532)	(0.17836)
$\partial SecDebt_{t,i}$	**0.00052***	0.00027	0.00027	-0.00068
	(0.00028)	(0.00046)	(0.00046)	(0.00180)
$\ln(size_{t,i})$	**-0.00413*****	-0.00407	-0.00361	**0.02739*****
	(0.00147)	(0.00242)	(0.00492)	(0.00954)
$price\_FFO_{t,i}$	-0.000004	-0.000001	-0.000003	-0.000005
	(0.000008)	(0.000001)	(0.000003)	(0.000005)
$ROA_{t,i}$	0.00059	**0.00354*****	**0.00381*****	0.00231
	(0.00037)	(0.00060)	(0.00122)	(0.00237)
$IPO\ Time_{t,i}$	0.00004	**0.00008***	**0.00029*****	0.00005
	(0.00003)	(0.00005)	(0.00009)	(0.00018)
$Debt\_Ratio_{t,i}$	**0.00101*****	**0.00128*****	**0.00473*****	**0.01168*****
	(0.00014)	(0.00023)	(0.00047)	(0.00092)
$Beta_{t,i}$	**0.00960***	0.00462	-0.01047	-0.04494
	(0.00519)	(0.00857)	(0.01739)	(0.03372)
Diversified	-0.00422	-0.04926	**-0.13291***	**-0.34001****
	(0.02348)	(0.03876)	(0.07868)	(0.15254)
Health Care	0.01844	-0.05582	-0.10759	**-0.24882***
	(0.02302)	(0.03801)	(0.07715)	(0.14958)
Hotel	0.03642	0.01140	0.08556	0.23397
	(0.02489)	(0.04110)	(0.08342)	(0.16172)
Industrial	0.00169	-0.02085	-0.05356	-0.21638
	(0.0246)	(0.04062)	(0.08245)	(0.15985)
Manufactured Homes	0.00141	-0.05745	**-0.17079****	**-0.53526*****
	(0.02443)	(0.04033)	(0.08187)	(0.15872)
Multi-family	0.00572	-0.04530	**-0.13243***	**-0.42111*****
	(0.02376)	(0.03923)	(0.07964)	(0.15439)
Office	0.00241	-0.02888	-0.05684	-0.14637
	(0.02357)	(0.03892)	(0.07900)	(0.15316)
Regional Mall	0.00592	-0.04135	-0.09465	-0.18707
	(0.02385)	(0.03938)	(0.07994)	(0.15499)
Retail Other	0.00543	-0.04986	**-0.14316***	**-0.34950****
	(0.02322)	(0.03833)	(0.07781)	(0.15086)
Storage Space	0.0305	-0.01840	0.02256	0.11925
	(0.02629)	(0.04341)	(0.08812)	(0.17084)
Shopping Mall	0.00228	-0.03333	-0.08672	-0.25202
	(0.02366)	(0.03906)	(0.07929)	(0.15372)

Recession	0.00189	**0.03832*** **	0.02720	**0.24415*** **
	(0.00619)	(0.01022)	(0.02073)	(0.04020)
UPREIT	-0.01998	**-0.02111***	**-0.10397*** **	**-0.24403*** **
	(0.00662)	(0.01093)	(0.02218)	(0.04299)
Self-Managed	**0.03895*** **	**0.07583*** **	**0.30866*** **	**0.82465*** **
	(0.00937)	(0.01547)	(0.03140)	(0.06087)
Self-Advised	-0.00834	-0.01705	-0.04162	-0.08404
	(0.01048)	(0.01730)	(0.03512)	(0.06809)
Adjusted R^2	0.0429	0.0415	0.0905	0.1844

*, **, and *** represent statistical significant at the 10%, 5% and 1% level, respectively.

Table 5: Estimation Results for 1st Stage Regression
of Determinates of Changes in Secured Debt Ratio.
(Dependent variable is $\partial SecDebt_{t,i}$. Yearly fixed effects are included in the regression but their results not reported.)

Variable	Coefficient	Standard Error	t-statistic
Intercept	**4.8680**	**1.5093**	**3.23*** **
$ROA_{t-1,i}$	-0.0223	0.0176	-1.27
$\ln(size_{t-1,i})$	**0.1783**	**0.0903**	**1.98** **
$Debt\_Ratio_{t-1}$	**-0.0363**	**0.0084**	**-4.35*** **
UPREIT	**0.6618**	**0.3417**	**1.94***
Self-Managed	0.1060	0.4497	0.24
Self-Advised	0.0521	0.5583	0.09
Diversified	**-2.6785**	**0.9944**	**-2.69*** **
Health Care	**-2.9569**	**1.0069**	**-2.94*** **
Hotel	**-3.1174**	**1.0231**	**-3.05*** **
Industrial	**-3.5093**	**1.0547**	**-3.33*** **
Manufactured Homes	**-2.4269**	**1.1044**	**-2.20** **
Multi-family	**-3.8677**	**1.0162**	**-3.81*** **
Office	**-3.3121**	**1.0008**	**-3.31*** **
Regional Mall	**-3.5019**	**1.0343**	**-3.39*** **
Retail Other	**-3.7735**	**1.0360**	**-3.64*** **
Storage Space	-1.8676	1.1831	-1.58
Shopping Mall	**-4.4265**	**1.0023**	**-4.42*** **
Adjusted R^2	0.0228		

*, **, and *** represent statistical significant at the 10%, 5% and 1% level, respectively.

Table 6: Estimation of the second-stage regression of REIT performance
(Dependent variable is 1-month, 3-month, 1-year, and 3-year holding period returns.
Standard errors in parentheses.)

Variable	1 month	3 month	1 year	3 year
Intercept	-0.03287	-0.00605	-0.08749	-0.23426
	(0.02746)	(0.04529)	(0.09192)	(0.17806)
$\partial SecDebt_{t,i}$	**0.00055****	0.00040	-0.00041	0.00130
	(0.00028)	(0.00046)	(0.00093)	(0.00180)
$\ln(size_{t,i})$	**-0.00411*****	-0.00396	-0.00340	**0.02797*****
	(0.00147)	(0.00243)	(0.00492)	(0.00954)
$price\_FFO_{t,i}$	-0.0000004	-0.0000014	-0.0000037	-0.0000050
	(0.0000008)	(0.0000013)	(0.0000026)	(0.0000050)
$ROA_{t,i}$	0.00058	**0.00345*****	**0.00365*****	0.00203
	(0.00037)	(0.00061)	(0.00123)	(0.00238)
$IPO\ Time_{t,i}$	0.00004	0.00007	**0.00030*****	0.00005
	(0.00003)	(0.00005)	(0.00009)	(0.00018)
$Debt\_Ratio_{t,i}$	**0.00099*****	**0.00126*****	**0.00475*****	**0.01169*****
	(0.00014)	(0.00023)	(0.00047)	(0.00091)
$Beta_{t,i}$	0.00965*	0.00441	-0.01295	-0.05183
	(0.00519)	(0.00857)	(0.01739)	(0.03368)
Diversified	-0.00560	-0.05032	**-0.13152***	**-0.34042****
	(0.02349)	(0.03875)	(0.07864)	(0.15233)
Health Care	0.01708	-0.05631	-0.10514	**-0.24702***
	(0.02303)	(0.03799)	(0.07709)	(0.14933)
Hotel	0.03515	0.01259	0.09488	0.25042
	(0.02489)	(0.04106)	(0.08333)	(0.16142)
Industrial	0.00004	-0.02115	-0.04947	-0.21149
	(0.02460)	(0.04057)	(0.08234)	(0.15951)
Manufactured Homes	0.00020	-0.05808	**-0.17018****	**-0.53786*****
	(0.02445)	(0.04033)	(0.08185)	(0.15855)
Multi-family	0.00386	-0.04613	-0.12992	**-0.42049*****
	(0.02377)	(0.03920)	(0.07955)	(0.15410)
Office	0.00086	-0.03038	-0.05577	-0.14906
	(0.02357)	(0.03888)	(0.07890)	(0.15285)
Regional Mall	0.00427	-0.04200	-0.09254	-0.18690
	(0.02386)	(0.03936)	(0.07987)	(0.15473)
Retail Other	0.00346	-0.05080	**-0.14030***	**-0.34915****
	(0.02323)	(0.03831)	(0.07775)	(0.15062)
Storage Space	0.02953	-0.01879	0.02264	0.11736
	(0.02632)	(0.04340)	(0.08809)	(0.17064)
Shopping Mall	0.00004	-0.03429	-0.08376	-0.25121

	(0.02365)	(0.03901)	(0.07918)	(0.15338)
Recession	0.00162	**0.03821*****	0.02741	**0.24423*****
	(0.00619)	(0.01021)	(0.02072)	(6.08000)
UPREIT	**-0.01957*****	**-0.02136***	**-0.10485*****	**-0.24564*****
	(0.00662)	(0.01092)	(0.02216)	(0.04293)
Self-Managed	**0.03924*****	**0.07715**(	**0.31268*****	**0.83309*****
	(0.00939)	(0.01549)	(0.03144)	(0.06091)
Self-Advised	-0.00848	-0.01780	-0.04342	-0.08829
	(0.01049)	(0.01731)	(0.03513)	(0.06805)
Adjusted R^2	0.0432	0.0412	0.0907	0.1861

*, **, and *** represent statistical significant at the 10%, 5% and 1% level, respectively.

Figure 1

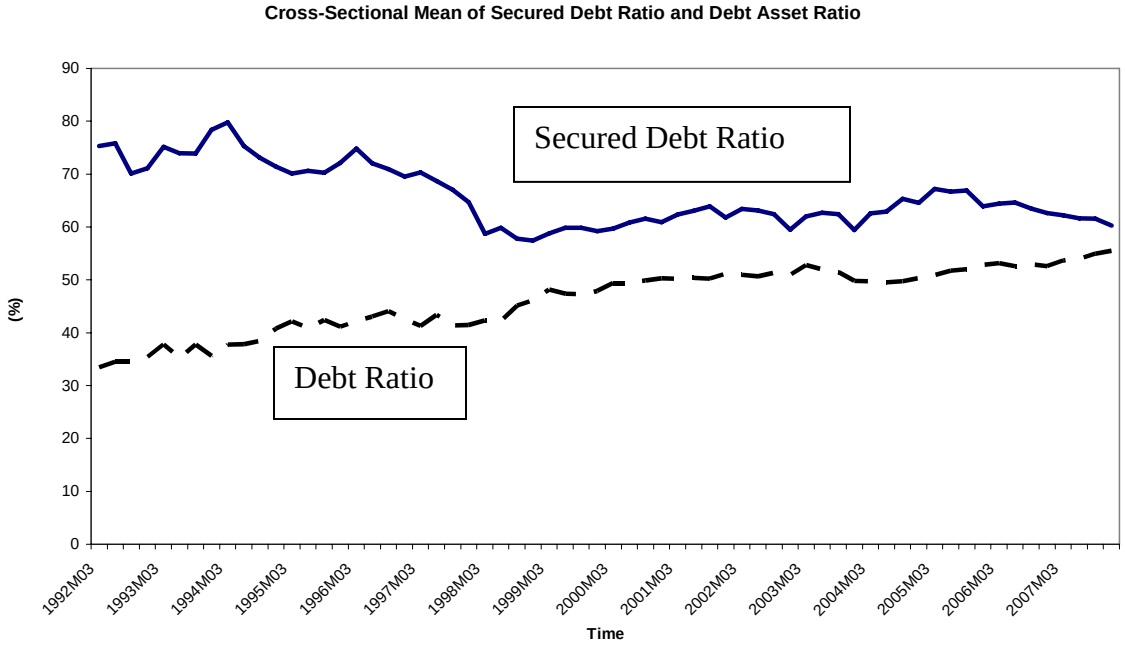

Figure 2