Bank Monitoring: Impact on Equity REIT Risk and Return

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Bank Monitoring: Impact on Equity REIT Risk and Return

by

Mariya Letdin

A dissertation submitted to the Graduate Faculty in Business in partial fulfillment of the requirements for the degree of Doctor of Philosophy. The City University of New York.

2015
This manuscript has been read and accepted for the Graduate Faculty in Business in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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THE CITY UNIVERSITY OF NEW YORK
Abstract

Bank Monitoring: Impact on Equity REIT Risk and Return

by

Mariya Letdin

Adviser: Professor Linda Allen

The first half of this paper studies the impact of bank screening on the risk of asset collateral pledged against secured loans for a sample of US equity REITs. Using a unique, hand-collected data sample, I show that bank screening results in lower risk assets being pledged as collateral, a finding confirmed by property type risk and location risk. Further, I find evidence consistent with the role of monitoring for secured, non-recourse mortgage loans. Finally, examining risk at the company level, I find that screening and monitoring of REITs' assets via utilizing secured mortgage financing (as opposed to unsecured, recourse debt) lowers the overall company risk of a REIT.

The second half of this paper explores the heterogeneity of debt in REITs in terms of both financing costs and equity returns. Using a loan level data set of REIT borrowings and controlling for REIT risk and loan collateral, we find that interest costs on secured debt are greater than on unsecured debt. Further, access to public debt markets (via the issuance of unsecured recourse bonds) raises the cost of bank debt, inconsistent with the presence of a hold-up problem for REITs' bank debt. Instead, we find evidence consistent with a bank certification effect since public debtholders benefit from the presence of monitoring banks. REITs with access to public markets continuously outperform REITs without access. The findings are robust to endogeneity controls and apply both during and outside the financial crisis of 2007-2009.
Acknowledgments

My eternal gratitude for guidance and direction provided by my dissertation chair, Linda Allen. The paper benefited from discussion with Joseph Weintrop, David Shulman, Tim Riddiough, Ko Wang, Su Han Chan, Chamna Yoon and participants of Bert Wasserman Department of Economics and Finance seminar at Baruch College. Alev Yalman, Paul Dunn and Jisu Kim provided excellent research assistance. I thank Vornado Realty Trust for providing funding. I thank Vladimir Khasin for invaluable advice and support and Natalya Khasina and Aleksandra Sufleta for believing in me. This work would not have been possible without Rinat Letdin - thank you for everything. All errors are my own.
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1 Introduction 1st Essay

There is a long-standing debate in theoretical literature about the relationship between credit risk and collateral in debt financing. In one strand of the literature, lower risk borrowers signal their creditworthiness by posting collateral in order to overcome equilibrium credit rationing (see Stiglitz and Weiss (1981), Chan and Kanatas (1985) and Besanko and Thakor (1987)). However, other studies find that higher risk borrowers pledge collateral in order to alleviate moral hazard concerns associated with strategic default and risk shifting (see Berger and Udell (1990), Berger and Udell (1995)) and induce bank monitoring activity (Rajan and Winton (1995)). Indeed, recent empirical work has shown that collateralized or secured debt is associated with smaller, younger, financially constrained firms (Jimnez et al. (2006), Rauh and Sufi (2010), Colla et al. (2013)). As these types of borrowers are more opaque, they have a higher risk profile.

However, the literature has been largely silent on the issue of which assets are to be pledged as collateral. Do lenders require low risk, high quality assets as collateral, or do borrowers choose their riskiest assets to pledge against debt? This question has become disentangled in the analysis of the relationship between overall firm risk and collateral requirements. In this paper, I separate these issues using a sample of highly transparent borrowers with balance sheets consisting of pledgeable collateral, Real Estate Investment Trusts (REITs). That is, the overall risk of a REIT is determined by the aggregate risk of its property assets. Figure 1 below illustrates the concept with a flow chart.

The capital structure of REITs includes both collateralized debt (mortgages) and unsecured debt (publicly traded bonds). I utilize a hand-collected database to distinguish between the risk of assets on secured debt (mortgages) as compared to unsecured debt issued simultaneously by the same firm. Thus, the use of REITs to study the relationship between firm risk and collateral allows a direct comparison of asset risk for unsecured and secured debt.

Simultaneously, REITs issue both mortgages and unsecured debt that has recourse to the general unencumbered assets of the firm. Using a database of REIT assets, I can identify which assets are pledged to mortgages and which remain in the asset base that serves as recourse to unsecured...
creditors. Once a mortgage is funded, the liability of the borrower is limited to the collateral value. Contrary to residential real estate and small business loans, where recourse and collateral are inseparable, REITs mortgages are non-recourse loans\(^1\) (Giambona et al. (2013)). As such, the liability of the firm to the lender is limited to the asset pledged as collateral. Banks screen REITs borrowers and collateral in order to determine the terms of secured, non-recourse mortgage loans. While prior literature has discussed relationship banking in great detail (Boot et al. (1991)), less is known about the screening mechanisms utilized by banks. Utilizing the transparent risk characteristics of real estate, I empirically demonstrate some of the screening mechanisms used by banks and the impact these have on the borrower. To my knowledge, this is the first paper to explicitly examine the role of the bank screening mechanism in identifying the risk of collateral pledged against secured loans.

Real Estate Investments Trusts (REITs) are a well suited sample to explore the characteristics

\(^1\)There are a few exceptions to this in the case of development projects and other speculative ventures, or perhaps in the case of smaller banks and borrowers. However, in the institutional space and for example in the CMBS world, all cash flowing loans are non-recourse.
of mortgages since REITs are legally required to have real estate as their sole asset base in order to qualify for REIT status. An advantage of using a REIT sample to examine bank screening mechanisms is that the asset base has highly observable risk characteristics that are attributed to either the property's location or type. Given that the REIT asset base is entirely composed of real estate, heterogeneity of debt cannot be explained by endogeneity in the firms asset composition as in non-REIT companies (Cvijanovic (2014)). Indeed, since all of the REITs assets are tangible and as such are eligible to serve as collateral, REITs are uniquely positioned to obtain either entity level debt (corporate bonds) or project specific debt (mortgages). Finally, REITs are also required to distribute the majority of their earnings, which requires them to access capital markets on an ongoing basis. Thus, transparency of management decision making cannot be obscured by the utilization of retained earnings to fund growth.

To empirically examine the relationship between mortgage loans and collateral risk, I test whether there is a difference in the risk profiles of assets pledged as collateral for mortgages as compared to assets that are unencumbered. I assign a property type risk and a location quality risk to each asset, using a property level database. The property type risk is based on whether the asset’s primary purpose is apartment, office, retail, etc. The location type risk is based on the MSA the asset is located in. I calculate the probability of encumbrance, and find that assets with lower risk characteristics are more likely to be used as collateral in commercial mortgages. These findings support a postulation made by Booth (1992) that lenders screen loans so that lower risk, better quality assets are required as collateral. Next I consider the relationship of monitoring and collateral. Evidence of monitoring is based upon the physical distance between the asset pledged as collateral and the REIT that owns and manages it. I find evidence of ongoing monitoring activity during the course of secured bank mortgage lending.

Finally, I consider the overall company level risk and the proportion of total debt allocated to secured debt. I utilize a hand-collected data set on the composition of debt (secured (mortgage) as compared to unsecured debt) in order to explicitly test the impact of bank screening on borrowing.
firm risk exposure. In order to address this question, I calculate the relationship between mortgage use and total company risk using the structural probability of default from Merton (1974) as well as firm measures of both systematic and idiosyncratic risk. The findings show total risk is negatively related to the proportion of debt allocated to mortgages. This finding implies that lower risk REIT borrowers are more likely to utilize secured debt in their capital structure. Since collateralized debt in the form of mortgage lending is associated with the presence of bank screening activity, I show that low risk borrowers signal their creditworthiness to banks by pledging high quality, low risk collateral. I further break down the risk into systematic risk and idiosyncratic risk, and find that it is predominantly idiosyncratic risk that is reduced by bank screening activity.

The paper is organized as follows. Section 2 describes the literature and formulates testable hypotheses. Section 3 describes my hand-collected database of REITs mortgage indebtedness and the individual property data. Section 4 provides methodology, including the description of the risk measurement for different property types and describes the results, whereas the paper concluding in Section 5.

2 Prior Literature & Hypotheses

In a mortgage scenario the lender has a chance to value and underwrite the asset prior to funding, monitor its performance throughout the life of the loan, and foreclose on the asset in the event of default. Because of this process, secured debt is subject to less information asymmetries between borrowers and lenders than if the assets were financed with unsecured debt. Stulz and Johnson (1985) conclude that secured debt reduces the monitoring costs of debt, and therefore secured debt is safer than unsecured debt ceteris paribus. Moreover, they state that existing bondholders are better off if the firm undertakes a new project and finances it partly with secured debt. Stulz and Johnson (1985) and Chan and Kanatas (1985) focus on the pledge of collateral in addition to the financed project, where the project is credit enhanced by additional collateral. This is contrary to the mortgage instrument and their result may or may not be applicable to REITs financing, where the liability of the borrower is limited to the real estate pledged as security. Besanko and Thakor
(1987) also conclude that there is a negative relationship between risk and collateral by predicting that lower risk borrowers will pledge more collateral in exchange for a lower interest rate. In contrast, (Berger and Udell, 1995) show that secured loans are higher risk, as assessed by the higher interest rate in their sample. However, their study excludes mortgages and only focuses on lines of credit. They also find that younger firms with shorter lending relationships are more likely to pledge collateral, which would imply higher risk and more informationally opaque firms are more likely to pledge collateral. Similar conclusions regarding borrowers of lower quality/higher risk being required by lenders to pledge more collateral are shown by Jimnez et al. (2006) in a study of small businesses in Spain. The existing literature does not distinguish between two related yet separate predictions - one is that assets are lower risk and the other that the borrowers are higher risk.

Several prior studies have looked at debt ratings as an indicator of leverage and debt composition. Faulkender and Petersen (2006) find that access to public debt markets is associated with higher leverage, as regular operating firms dont have many alternatives for financing and are thus constrained without access to the bond market. REITs however are not subject to the same constraints, as access to the mortgage market enables them to obtain project specific financing with higher leverage then available from the public debt market. In related work, recently Colla et al. (2013) and Rauh and Sufi (2010) have demonstrated the heterogeneity of debt. Rauh and Sufi (2010) show that secured debt is more prevalent for low-credit-quality firms, and has tight covenants. In contrast, REIT secured debt does not imply company level covenants, and it is the public debt that introduces restrictions at the corporate level. REITs, as a homogenous sample vs the general population of firms, provide a useful environment to study this question because the composition of long term debt tends to include both secured, non-recourse mortgages and unsecured, recourse publicly traded bonds (see Giambona et al. (2012)). The REIT literature has so far focused on capital structure as in Boudry et al. (2010), Hardin III and Wu (2010), Harrison et al. (2011), Giambona et al. (2008) and Giambona et al. (2012). The main focus of these studies was to explain leverage. Since a REIT is a company that owns and manages real estate assets as its only
line of business, the risk of the assets and the company are closely aligned. Moreover, secured loans to REITs are in the form of mortgages which have distinct pledges of encumbered assets and which are non-recourse to other, non-pledged firm assets. Thus, tests of the hypothesis of the relationship between risk and collateral can distinguish between individual pledged asset risk and overall firm risk.

_Hypothesis 1: Assets pledged as collateral for mortgages (secured, non-recourse loans) are lower risk than unencumbered assets._

In order to test the first hypothesis, I consider those property characteristics that are known by the screening banks prior to the granting of a mortgage loan: location (Chichernea et al., 2008) and property type (Ambrose and Nourse, 1993). I use the Property Type and Location Type characteristics as proxies for risk of the asset as other property characteristics that a bank would consider such as Lease Terms, Tenant Quality, Net Operating Income and Physical Quality are not available in the data sample. Location and property type however are the most permanent characteristics and ones that are difficult to change; as such I believe that they are the most important risk characteristics of the assets. Recent studies (Giambona et al. (2012), Giambona et al. (2013)) establish a strong link between real estate as a pledged asset class and a lender’s willingness to extend higher leverage loans. Although I dont test it explicitly, establishing a positive link between mortgages and leverage which would further support Hypothesis 1 - provided the assets chosen for collateral are lower risk, higher leverage would be permissible.

One of the defining attributes of secured bank debt is monitoring of the assets. Rajan and Winston (1995) show that pledging collateral incentivizes the lender to monitor. Monitoring ensures that the value of the asset does not fall below the face value of the loan. Agarwal and Hauswald (2010) and Knyazeva and Knyazeva (2012) show that physical distance matters for monitoring and gathering of information. Using location I can calculate the distance of the property to the headquarters of the REIT. I use the distance as a proxy for monitoring of the asset by the borrower.
Hypothesis 2: Assets that are more likely to be monitored [closer to the parent company] are more likely to be pledged as collateral

By assessing whether the likelihood of a property being pledged as collateral is impacted by its distance from the REIT, I test whether the lender expects the borrower to monitor the asset. The alternative explanation would be that the lender expects to be the sole monitor of the pledged asset and not assign any importance to the borrower managing it, as they expect to own it in a bad state. Unfortunately the identity and location of the lender are not known, to test what monitoring the lender may perform directly. However, as Knyazeva and Knyazeva (2012) have shown, lenders are more likely to provide financing to borrower in close physical proximity. Thus by estimating the asset-borrower distance I am also assessing the asset-lender distance.

A REIT is a collection of real estate investments, a series compiled over time, and its debt structure is culmination of accumulation of a series of asset level financing decisions and/or corporate level decisions. Morellec (2001) finds that pledging part of the firms assets as collateral increases firm value. Secured debt prevents the firm from selling assets and as such reduces the default probability and preserves liquidation value. It also reduces bankruptcy costs due to lower enforcement costs. Pledging assets reduces the probability of default. Monitoring the assets reduces firm risk. These priors lead me to the final hypothesis:

Hypothesis 3: A higher allocation to mortgages as a percentage of total debt should be associated with a borrower of lower risk.

REITs have a choice in sources of funds: secured debt (collateralized by property), unsecured debt and equity. Issues impacting the firms optimal capital structure, such as tax benefits of debt Graham (2000), and dividend implications of debt Miller and Modigliani (1961), are not applicable to REITs since REITs do not pay taxes and are required to distribute the majority of their earnings
as dividends. Thus, the study of REITs provides an opportunity to study capital structure choice abstract from dividend policy and tax considerations. The decision of two types of debt is unique to REITs, as they are required to hold real estate (vs engage in operating activities) and thus could use exclusively secured debt for all of their assets.

Brown and Riddiough (2003) study the characteristics of public (unsecured i.e. recourse debt) issuers. They find that REITs that issue public debt do so to achieve target total leverage ratios, to retain an investment grade credit rating, and fund investment opportunities with equity. Brown and Riddiough (2003) show a negative relation between the likelihood of a public debt issue and the pre-offer secured debt, ie firms with higher proportion of secured debt would tend to issue equity or obtain more secured debt to fund their investment opportunities. I use these findings to split the sample into a sub-sample of firms with access to public debt markets and those without, to ensure results are not driven by a subset of the sample. Giambona et al. (2012) find that higher use of mortgages indicates that a firm is of inferior quality, as proxied for by Tobin’s Q. I posture that these firms are simply lower risk.

3 Data Overview and Methodology

I utilize two data sets: one on the firm (REIT) level and one on the property (asset) level. The REIT-level database includes quarterly observations of REIT operating performance. The property data set provides asset level encumbrance, location and property type information.

3.1 REIT Level Data

The initial sample is obtained from CRSP and SNL for years 2000 to 2012. In order to assess variable accuracy, randomly sampled values were reconciled against the REIT 10K and 10Q reports filed with the SEC. Two possible variables, Mortgage and Notes and Secured Debt field in SNL were examined and the difference was pinpointed to the fact that the latter excludes secured lines of credit. Lines of credit are of great importance to REITs. However due to their short term nature they are more likely to be used for liquidity management vs long term financing decisions. Lines
of credit are inherently different from mortgages not only in their short term, but also the ability of lender to modify the line and to monitor the borrower. Mortgages cannot be modified once funded and do not provide for corporate entity monitoring, the screening and monitoring only takes place at the asset level. The Mortgages and Notes SNL field 138535 was chosen as the most appropriate for the study since the main question is focused on choice of long term collateralized debt allocation. SNL reports a field for Mortgages and Notes for 19,293 company quarters for 2000-2012. After quarters during which a company was either not operational or did not have REIT status were dropped, 7,098 company quarters remained with 2,654 missing observations. A handful of REITs focusing on timber or other non-traditional lines of business were omitted. Companies with less than one year of observations were excluded, as well as those that did not break down their debt composition. SNL data with companies that were either acquired or otherwise defunct prior to roughly 2005 had no observations available and many companies only had annual observations prior to 2004. The missing 1,744 observations were hand collected from quarterly reports for a final sample of 6,188 Mortgages and Notes observations across 216 REITs.

Since many REITs could access the public debt and equity markets to fulfill their funding needs, controls for issuance of both were included. Public debt and equity issuance data were obtained from SNL. Property investment is the expected purpose for REITs to seek external funds. However, a potential alternate use of funds could be equity repurchases. In order to address this concern, information for equity repurchases was obtained from SNL for years 2008 to 2012. The remaining equity repurchases data for years 2000 to 2007 were hand collected from Lexis-Nexis. REIT corporate bond ratings were obtained from Compustat. Moodys corporate bond spreads, Libor, treasuries and 30 years mortgage rates were obtained from the Federal Reserve. The Loan Officer Survey was obtained from St. Louis Federal Reserve. The final sample of 6,188 company quarters of observations consists of 216 REITs. The shortest time span per REIT is four quarters and the longest is 52 quarters, with an average time span of 28 quarters. The mean percent of Mortgages as a share of Total Debt for each quarter in the sample is shown in Table 2. Despite fluctuations, the mean has been consistently above 50% of Total Debt. Thus I believe that
Mortgages are a very important component of REIT capital issuance decisions and understanding thereof sheds light on predicting riskiness of REITs in the future.

The summary statistics are presented in Table 1. MORTGAGES as a proportion of total debt average 60.5% for the pooled sample. The complete distribution of Mortgages as a share of Total Debt is shown in Figure 3. While there are REITs that do not utilize mortgages at all and those that tend to rely exclusively on mortgages, the majority of the sample is distributed over a spectrum of mortgage use. SIZE is calculated as a natural log of market value. The market value of the company is determined by subtracting the book value of equity from total assets and adding back the market value of equity. LEVERAGE is calculated as Total Debt divided by Market Value. The average leverage for REITs in the sample is 44.7 percent. AGE is shown in quarters, and thus the average age of a company is approximately 9.5 years. Growth Opportunities proxied for by Market to Book is 1.22 (nearly identical to Harrison et al. (2011)). PROFITABILITY is calculated as funds from operations (FFO) scaled by Total Assets, as NOI is not customarily used for REITs due to the substantial depreciation expense associated with real estate assets. EQUITY ISSUE and PURCHASE, UNSECURED DEBT ISSUE and DEBT RATING are all dummy variables where 1 indicates activity, and 0 lack thereof. Comparing to the general public stock market study by Colla et al. (2013) where they find that 60 percent of firm year observations in their sample have debt ratings, the REIT sample has 41 percent of firm quarter observations with a debt rating. Given that this a pooled sample, the average number of companies with a debt rating is not necessarily reflected in the mean statistic. When the sample is bifurcated into rated and unrated companies in the Robustness section, the total number of companies with a debt rating is 87 out of the total sample of 216 REITs. Out of the 87 REITs with a debt rating, 25 obtain it during the sample period. To examine the mortgage use over time, Table 2 provides a quarterly breakdown of the mean debt allocation to mortgages. Column 2 of Table 2 shows the number of unique firm observations in each quarter, with 107 being the lowest and 135 the highest. There is a marked increase in relative mortgage use from 2004 to 2007, a time of looser credit standards and higher property values. Despite substantial instances of bond issues, as shown in Column 5 of
Table 2, the allocation to mortgages nevertheless increased during this time. The lower allocation to mortgages during the financial crisis and beyond is most likely due to tightening of lending standards by the lending institutions. Notably, these numbers of 59-60% allocation to mortgages are consistent with the pre-boom period of 2000 to 2003. Post financial crisis, bond issuance has resumed but it appears the mortgage lending standards have remained tight relative to the bond market as evidenced by the slightly lower allocation of long term debt to mortgages with a low of 56%. The last time in the sample mortgage use was this low was in 2000. Leverage, as pointed out by Sun et al. (2014) has remained lower after the crisis, possibly since bonds have covenants restricting overall leverage (The majority of bonds restrict total leverage to 60% and secured leverage to 40%, as shown by a Wells Fargo Fixed Income Research Report on Debt Covenants 2014). Also of notice is the Equity Issues that have taken place during high valuation of REIT shares period, which would appears to be consistent with a market timing theory (Baker and Wurgler, 2002). Untabulated Equity Repurchases instances further support market timing as Equity Repurchases peaked during the financial crisis 2007-2009 period when the stocks were undervalued from the managements perspective. Prior to examining the role played by banks, I consider the potential driving causes behind a REITs choice to borrow using a mortgage. Table 3 provides the results of an OLS regression where the share of Mortgages as percent of Total Debt is the dependent variable. The regression is specified as follows:

\[
\text{Mortgage}_{i,t} = \alpha_{i,t} + \delta_{1i,t}\text{RatingDummy} + \delta_{2i,t}\text{Profitability} + \delta_{3i,t}\text{Age} + \\
\delta_{4i,t}\text{EquityIssue} + \delta_{5i,t}\text{EquityRepurchase} + \delta_{6i,t-1}\text{Leverage} + \delta_{7i,t-1}\text{CreditLine} + \\
\delta_{8i,t}\text{BondIssue} + \delta_{8i,t}\text{Size} + \varepsilon_{i,t} \tag{1}
\]

Consistent with bond covenant leverage restrictions mentioned above, important explanatory variable is Lag Leverage. I use Lag Leverage from the prior quarter to explain the choice to utilize a mortgage in a given quarter. Equation specification in Column 2 controls for access to bond
markets, proxied for by whether or not a firm has a debt rating (Faulkender and Petersen (2006)). Leverage and Access to Bond Markets have explanatory power of the regression to 40% of the driving choices to utilize mortgages for a pooled sample. Column 3 provides a fixed effects panel regression, for a look at within company variation. As in the prior regressions, Leverage is a highly important explanatory variable. It seems that REITs utilize mortgages because they are able to access greater levels of leverage than they would otherwise be able to. Similar to Faulkender and Petersen (2006) and Rauh and Sufi (2010), I find that as REITs become larger and more established (older, as shown by the Age variable) and gain access to the bond markets they are relatively less likely to rely on mortgages (not necessarily abandoning them as a source of funding). It is notable to find the strong negative relationship of reliance on mortgage debt and credit line utilization (the proportion of credit line outstanding from the total available). Credit lines are short term debt and are not a substitute for mortgages, but are strongly positively correlated to bond issuances. This can be explained by a Hardin III and Wu (2010) finding that REITs cultivate banking relationships via lines of credit to attain access to senior unsecured bonds. Both are thus negatively related to mortgage use, which comes with asset level oversight exclusively. Equity Issue is found to be positive and significant, that is at time when equity valuation is high due to high property values, REITs access both the public equity markets and the property debt markets. This finding is consistent with Brown and Riddiough (2003). Rauh and Sufi (2010) find that non-REIT companies are less likely to use mortgages if they are issuing bonds in that quarter, a finding that I show applies for REITs as well.

3.2 Property Level Data

Prior to offering a mortgage to a borrower the lender is able to observe the risk profile of the asset during their due diligence period. In order to estimate the probability of a property being pledged as collateral, the observable risk components of a property are considered. Property characteristics such as location Chichernea et al. (2008) and property type Ambrose and Nourse (1993) are some of the major factors that determine the risk and return that a property investment is likely to
generate. Next I consider the likelihood of monitoring by the borrower and/or the lender over the life of the loan. A proxy for monitoring by management is the distance of the asset (property) to its owner (REIT), analogous to the relationship between bank monitoring and distance as shown in Knyazeva and Knyazeva (2012). Property data is obtained from SNL for 2000 to 2012. Observations with missing MSA code (18,957) or located in Puerto Rico (1,022) were excluded. Only the assets owned by the REITs included in the study are used. The resulting sample consists of 476,442 company quarters, for 174 companies. Table 4 provides the summary statistics for the property sample. SNL provides all street addresses and some coordinates for the properties owned by REITs. Addresses were used to obtain the missing coordinates for 2,300 properties. The final sample consists of 60,160 unique property coordinates over the sample time period of 1994 to 2012. The coordinates of the REITs headquarters were obtained based on headquarter street addresses. ArcGIS was used to calculate the distance, in miles, from a REIT's headquarters to each one of the assets they own each quarter. The greatest distance from a REIT to an asset they own is 5,128 miles, however 95 percent of the sample is within 2,500 miles. The sample mean distance is 972 and the median is 818 miles. The shortest distance is less than one mile, and 25% of the property sample is within 350 miles from their respective owners. An illustration of the distance calculation is demonstrated in Figure 4 which uses HCP, a healthcare REIT with headquarters in Irvine, CA and their real estate holdings nationwide.

Insert Figure 4: HCP Holdings

SNL provides encumbrance data for individual assets. A shortcoming of the dataset is that one cannot distinguish among properties with zero debt and those that do not report it. Thus the determining whether or not the asset is pledged as collateral could be omitting some observations of assets that are pledged. However this should only weaken the difference (if any) between encumbered and unencumbered assets.
3.3 Property Risk Characteristics

To assess the importance of observable risk characteristics on the probability of asset encumbrance, I assign risk characteristics to the descriptive attributes such as property type and location. I consider the property type information available, as shown in Table 4. Different property types yield different returns and their performance is reflected in their capitalization rates (Net Operating Income divided by Transaction price) as shown by Ambrose and Nourse (1993) among others. Figure 5 reproduces a 2013 report based on NCREIF Cap Rate Survey, showing the premium on different property types has been fairly consistently ranked over time.

Insert Figure 5: NCREIF Cap Rate

Multifamily trades at the lowest cap rates, followed by Office, Retail, and Industrial. Other property types such as hospitality are known to trade at even higher premiums Ambrose and Nourse (1993). Table 4 provides the conversion of the detailed property types into categories. For example, Retail is broken up by SNL into Retail: Other, Shopping Center and Regional Mall. I assign all retail properties a category of risk type 3, to show that they are higher risk investments than multifamily and office properties, consistently with historical Capitalization Rate data. The Robustness section shows the individual results across non-aggregated 12 property types as specified by SNL. Superior locations are characterized by ease of liquidity and higher demand (Chichernea et al., 2008). Demand for commercial and multifamily real estate is driven directly by population working and residing in a given area. Liquidity, or the ease of selling an asset, is driven by both population and the economic environment of a marketplace. Thus a favorable location or a location of lower risk would include factors of high user demand and high liquidity at the time of sale. In order to estimate location quality, foreign investment and residing population are used as proxies. MSA population statistics are obtained from SNL. Cities are ranked as lowest risk (Gateway Cities) and subsequently increasing in risk inversely related to MSA population. The MSAs are grouped and coded into 1 to 5 risk categories with 1 being the lowest risk and 5 the highest. A selection of
MSA risk categories is shown in Table 5. Each property is then categorized by its MSA type risk level and its property type risk level.

The resulting summary statistics of the property level risk characteristics are shown in Table 6. The average MSA Risk Type is 3 and the average Property Risk Type is 3.5. Whether or not an asset was acquired as a part of a portfolio (PORTFOLIOBUY) is a binary variable with a value of 1 for yes and 0 for no. Nearly forty seven percent of the sample were portfolio acquisitions (vs individual asset purchases). While the data is only available for about two thirds of the sample, slightly over twenty percent of the properties were sold as a part of a portfolio as well, as noted in PORTFOLIOBUY, also a binary variable. Whether or not an asset is a part of a portfolio is an important consideration of a firms mortgage decision, since it imply that more than one asset was used for collateral for a loan as in Brown and Riddiough (2003) or that a portfolio loan was assumed at the time of the acquisition. In thirteen percent of the observations, the properties were acquired as a part of a merger. Similar to a portfolio acquisition, a merger could also signal a potential lack of active decision on the REITs part as the assets could have mortgage debt already in place. There is no way to observe the decision to recapitalize in this sample. ³

4 Empirical Findings

4.1 Collateral Risk

Hypothesis 1 conjectures that in the presence of bank screening activity, lower risk assets are more likely to be pledged as collateral than higher risk assets. I utilize the property risk variables in order to examine the risk of encumbered properties as compared to unencumbered properties.

The MSA Type risk and Property Type risk parameters are used to test Hypothesis 1, that properties pledged as collateral would be lower risk. To gauge the sample, I run a simple t-test of property risk attributes between encumbered and unencumbered properties. The results in Panel B of Table 6 show that there is a statistically significant difference between the mortgaged and the unencum-

³My working paper Revealed Decisions of REITs addresses this process
bered assets with the lower risk properties more likely to be pledged as collateral. I proceed to estimate the following equation where Risk is either Property Type or Location Risk:

\[
Pr(Mortgage_i) = \alpha_i + \delta_i \text{Risk} + \varepsilon_i
\]  

(2)

The regression results are shown in Table 7. The binary dependent variable is whether or not a property is encumbered and the regression is estimated using probit, using the property level data on over 476,000 property quarters. Consistent with Hypothesis 1, both risk measures are statistically significant and negatively related to the probability of an asset being encumbered by a mortgage. The omitted property risk type 1 is Multifamily, the lowest risk type. The decreasing coefficients on the increasing Property Type Risk indicate that the higher the risk of the property, the lower the likelihood that it would be encumbered by a mortgage. In order to examine whether the results are capturing other phenomena, I include control variables for time (quarter) and whether or not the property was purchased or sold as a part of a portfolio, or acquired through a merger. The results are demonstrated in Table 8. The sample size is decreased by over a third due to the lack of availability of control variables for all of the observations. The resulting sample size is approximately 300,000 observations. Columns 1 through 2 include the explanatory risk variables individually with controls. Column 3 includes all of the explanatory risk variables together along with controls. An asset that is a part of a portfolio or a merger has a higher likelihood of being pledged as collateral. All risk characteristics remain statistically significant and negative, even when both are included simultaneously as in Column 3.

4.2 Monitoring and Risk

Next I test Hypothesis 2, given that monitoring lowers risk, assets that are more likely to be monitored are more likely to be pledged as collateral. Probability of monitoring is defined as the distance from the asset to the borrowers headquarters. Table 9 provides the results of testing Hypothesis 2. Column 1 reports univariate results, where a statistically significant negative relationship is es-
tablished between distance and likelihood of the asset collateralization. Its converse is then true, strong likelihood of active monitoring by the owner (close proximity to company headquarters) means the asset is more likely to be used as collateral for a mortgage Column 2 includes control variables, and the relationship remains highly statistically significant. Column 3 includes MSA Type Risk, 4 categories of Property Type Risk and Monitoring in the same regression along with controls. All remain highly statistically significant and negatively correlated to the likelihood of property encumbrance.

4.3 Borrower [REIT] Level Risk

In this section, I consider the impact of lender screening, monitoring and collateral requirements on the overall firm (REIT) risk, as conjectured in Hypothesis 3. In order to test Hypothesis 3, I examine the relationship between mortgage utilization and the total, systematic, idiosyncratic risk of the REIT firm. Total Risk is defined as the standard deviation of REIT returns calculated on a quarterly basis using daily values. The regression specification is as follows:

\[ TotalRisk_{j,t} = \alpha_{j,t} + \gamma_{1j,t}Mortgage + \gamma_{2j,t}Leverage + \gamma_{3j,t}Profitability + \gamma_{4j,t}DebtRating + \gamma_{5j,t}Age + \gamma_{6j,t}Size + \varepsilon_{j,t} \quad (3) \]

The results are shown in Table 10. In line with prior literature, leverage and risk are positively related. However, allocating debt towards mortgages is associated with lower risk. Column 2 includes control variables. Size and Profitability have a negative relationship with risk, however only Size is significant. Leverage remains positive and significant. Mortgages remain negative and statistically significant. Column 3 reports estimation with firm fixed effects for a look at variation within a firm. Allocation of debt towards mortgages significantly lowers total firm risk. The finding is the same in Column 4, where variation between firms is considered. Those firms that utilize more mortgages, controlling for overall leverage, are less risky. More profitable firms are found to be
less risky as are larger firms.

To study the impact of Mortgages further, I separate systematic and idiosyncratic risk. In order to do so, I first estimate a one factor CAPM using the CRSP value weighted market index. The CRSP value weighted market index serves as a proxy for market return. Daily returns obtained from CRSP are used to estimate quarterly Betas for each REIT. The Beta serves as a proxy for systematic risk. The residual from the equation serves as a proxy for idiosyncratic risk. The regression is as follows:

\[
\text{Return}_{j,t} = \alpha_{j,t} + \beta_{j,t} \text{MarketReturn} + \varepsilon_{j,t}
\] (4)

Table 11 presents the results of estimating the Betas as specified in Equation 4. As expected, for the entire sample the coefficient estimate is close to 1. The number of observations 460,546 is reflective of the daily data. The one factor model has an explanatory power of 19.8%. The estimated Beta is then used as a measure of systematic risk, as a dependent variable in Equation 5 below.

\[
\hat{\beta}_{j,t} = \alpha_{j,t} + \gamma_{1j,t} \text{Mortgage} + \gamma_{2j,t} \text{Leverage} + \gamma_{3j,t} \text{Profitability} + \\
\gamma_{4j,t} \text{DebtRating} + \gamma_{5j,t} \text{Age} + \gamma_{6j,t} \text{Size} + \varepsilon_{j,t}
\] (5)

Table 12 provides the results. Controls for time, in quarters, are included in all specifications. Column 1 reports OLS results, where Mortgages are negative and significant in relation to systematic risk. Column 2 includes control variables and Column 3 considers within firm variance. Mortgage allocation is no longer significant in explaining systematic risk, once other variables are included. Next, I examine idiosyncratic risk, estimated as the residual estimated in Equation (4). Idiosyncratic risk is the dependent variable in equation 6:
\[ R\hat{e}_{j,t} = \alpha_{j,t} + \gamma_{1j,t} \text{Mortgage} + \gamma_{2j,t} \text{Leverage} + \gamma_{3j,t} \text{Profitability} + \gamma_{4j,t} \text{DebtRating} + \gamma_{5j,t} \text{Age} + \gamma_{6j,t} \text{Size} + \varepsilon_{j,t} \]  

(6)

Table 13 reports the determinants of idiosyncratic risk. This finding is consistent with the second hypothesis, that higher allocation to mortgages should be associated with lower risk. The finding is robust to inclusion of control variables as in Column 2. Column 3 The coefficient on Mortgage however is still negative and highly statistically significant.

### 4.4 Robustness Tests

The robustness tests are divided into two alternative explanations. First, several studies have shown that the ability to access bond markets could be driving by the heterogeneity of debt (Faulkender Petersen (2006), Rauh Sufi (2010), Colla et al. (2013)). I therefore perform a robustness check by bifurcating the sample into firms with and without public market debt access, using bond rating as a proxy for market access. I estimate equation 6 for the subsample with access to public debt market. The results are reported in Table 14. Column 1 shows only those REITs that had access to the bond markets. REITs with market access are still found to be less risky in terms of idiosyncratic risk when a higher proportion of their debt is allocated towards mortgages. Given that the access to public debt markets is potentially endogenous for REITs, I use a two stage approach to first estimate the probability that a REIT will have access to the bond market and subsequently include the estimated parameter into the risk equation. The first stage results are shown in Table 15. As in Faulkender Petersen (2006), I use Age and Size to predict public market access. Table 16 reports the second stage results, estimated with OLS. The idiosyncratic risk is found to be positively and statistically significantly related to public market debt access, in complete symmetry to the negative and statistically significant relationship of the secured debt ratio.

Another robustness check disaggregates the property risk index into its component parts in
order to examine the likelihood of property encumbrance in more detail. Thus, I consider each detailed property risk characteristic (HealthCare, Hotel, Industrial, Manufactured Home, Multifamily, Multiuse, Office, Regional Mall, Retail Other, Self-Storage, Shopping Center and Specialty) individually without aggregation to risk levels. The results are reported in Table 17. Multifamily, Office and Regional Malls stand out as the most likely to be pledged as collateral, consistent with their lower risk profiles.

5 Conclusion

In this paper I test the impact of screening and monitoring on borrower risk, by focusing on REITs, a group of highly transparent borrowers with tangible assets. I first examine the relationship between observable risk during the lender screening process, subsequently consider the relationship of monitoring and collateral and finally look at the overall implications of both on REIT risk. Prior studies predicted mortgages to be extended on better quality assets (see Stulz and Johnson (1985), Boot et al. (1991)) others attributed mortgage use to poorer quality borrowers (see Jimnez et al. (2006), Giambona et al. (2012)). I study the questions of collateral and borrower separately. I find that lenders extend non-recourse secured debt (mortgages) on lower risk assets. I also find significant evidence of a positive relationship between monitoring and collateral, by using the physical location of the assets. Using a unique sample of outstanding mortgage balances obtained from company quarterly reports to supplement database gaps, I find that screening and monitoring at the asset level translates to mortgage use having a negative relationship with total company risk. Finally I show that the screening and monitoring that comes with use of secured long term debt lowers primarily idiosyncratic risk.

6 Introduction 2nd Essay

While recent capital structure literature has acknowledged the heterogeneity of debt \(^4\), the question of the ramifications of debt composition has not been explored. A defining attribute of debt is the

\(^4\)Rauh and Sufi (2010) and Colla et al. (2013)
identity of collateral supporting the repayment guarantee. Debt can be broken down into two main categories: secured debt and unsecured debt. Secured debt is collateralized by tangible assets. The alternative source of funding is senior unsecured public debt. Senior unsecured debt has, as security, a corporate guarantee of the company but no specific assets identified as collateral. A distinction that is not apparent in prior literature is whether or not secured debt is also recourse debt. Where the distinction becomes crucial is in the case of default and bankruptcy. In a simplified case where all collateral was pledged as security, if the value of collateral at the time of bankruptcy is less than or equal to the face value of the loan and interest owed, the secured lender would receive the collateral pledged as security and the unsecured lender would receive nothing. If the value of the collateral exceeds the owed amount, the unsecured lenders would be entitled to the remaining value after the secured lender is satisfied. For the sample used in this study, the secured lenders claim is typically non-recourse to the remaining assets of the company. The secured lender then is especially motivated to monitor the value of the assets pledged as collateral, since it is their only source of repayment. Bond holders, or recourse lenders, do not monitor asset performance and, dissimilar to bank lenders, cannot renegotiate their agreements based on performance of individual assets.

Literature suggests that the monitoring effect of lenders can be of value to the borrowers, by providing certification benefits. Alternatively, monitored loans could be a detriment due to hold-up problems Rajan (1992). Certification benefit (Sufi, 2009) has primarily been documented for opaque borrowers, where firms are able to access additional sources of capital after their quality was certified by lenders or rating agencies. Similarly, secured lenders provide a certification benefit to unsecured lenders by monitoring the performance and value of the assets. As an alternative, the hold up theory (Hale and Santos, 2009) shows that banks obtain private information as a result

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5The choice to use has been difficult to disentangle since for regular firms it is obscured by the endogenous presence of collateral on a company balance sheet. Giambona et al. (2012) (Cvijanovic, 2014)

6Jimnez et al. (2006), Stulz and Johnson (1985)
of monitoring and borrowers are then held up and endure higher interest rates due to their limited borrowing options. Once borrowers obtain alternative sources of funds, such as access to the public debt markets, they face lower interest rates on bank debt as the hold up no longer holds.

Real Estate Investment Trusts offer a unique opportunity to examine different debt instruments. REITs are heavily dependent on outside sources of capital since they are limited in retained earnings, due to their tax exempt nature and the accompanying regulatory requirement to distribute income. REITs have tangible, identifiable assets that can be pledged as collateral. As such, the endogeneity of pledging collateral faced in studies of non-REIT firms is not applicable since REITs asset base is relatively homogenous in tangibility. REITs rely on a variety of external sources of funding and use an assortment of debt instruments, secured and unsecured, and recourse and non-recourse. Given the access all REITs have to the private debt market via mortgages, REITs represent an excellent sample to examine the prevalence of either certification or hold-up for debt instruments. Are mortgage lenders holding up their borrowers until they are able to access the public debt markets or do mortgage lenders monitor in order to maximize the recovery value and benefit the bond holders?

To shed light on this question I use a hand collected sample of mortgage balances and the SP Capital IQ loan level database to estimate the determinants of financing costs for different types of debt. Subsequently, I control for the endogeneity of choice to access the public debt markets and lastly I consider the impact of the debt composition on equity returns.

The results show that the interest cost on secured (non-recourse) mortgage debt is greater than that of unsecured (recourse) debt even after controlling for loan type, company characteristics, company risk and macroeconomic conditions. Obtaining a debt rating does not have hold up effect for REITs, since the interest cost of monitored debt is found to be greater with access than with-

\footnote{At least 90\% of taxable income must be distributed to shareholders annually in the form of dividends. Source: http://www.sec.gov/answers/reits.htm.}
out access to alternative (non-monitored) sources of funds. This finding demonstrates that REITs are fundamentally different from regular operating companies as the prior hold-up result found by Hale and Santos (2009) does not apply to REITs. This phenomenon can be explained by the difference in motivations of REITs to access the public debt markets vs regular companies. An operating company accesses the public debt markets in order to increase leverage, as shown by Faulkender and Petersen (2006). REITs access the public debt markets in order to obtain flexibility of operations not available with secured debt and to receive lower interest rates on unsecured debt. In order to access the public debt markets, REITs lower leverage as shown by (Hardin III and Wu, 2010). Given the varying motivations for issuing public debt, it is not surprising that the consequences of accessing the public debt markets would be different for REITs vs non-REITs.

A greater allocation to mortgage debt is found to lower interest rate on subsequent borrowings. These findings are consistent with certification effect, where the secured debt lenders certify the recovery values for the benefit of unsecured lenders. REITs with market access are found to encounter higher interest rates from secured lenders. This is due to the fact that the position of the bank lender is inferior after a REIT gains access to unsecured debt. If the REIT has no access to public debt markets, then the mortgage shortfall would be equity financed. If the REIT has access to public debt markets, the mortgage shortfall may be financed using recourse unsecured debt. This creates a potential debt overhang problem impacting bank lenders, thereby requiring a higher interest cost on mortgages for REITs with public debt access as compared to REITs without public debt access. REITs are willing to pay this higher cost for the property maintenance certification provided by monitoring banks that enable them to access lower cost public debt. Access to publicly traded debt market decreases the cost of unsecured (non-monitored) debt. REITs with public access and unsecured debt are not subject to as much oversight. In the absence of oversight over the unencumbered assets, a REIT with unsecured debt is able to pursue projects of higher risk and would be expected to achieve higher returns. I find that access to public debt markets is positive and significant in explaining REIT returns.
Since a REITs access to public debt markets is not exogenous, I perform a 2 SLS approach to address the endogeneity concern. I predict the probability that a REIT will access the public markets using percent of insider ownership along with other controls. Ghosh et al. (2011) have shown that entrenched managers in a REIT impact its capital structure, and that entrenched managers are averse to an increase in likelihood of bankruptcy. Since the introduction of recourse debt increases the likelihood of bankruptcy, I expect and find a significant negative relationship between manager entrenchment and the likelihood of obtaining recourse unsecured public debt. The second stage results using predicted market access are robust, market access is positively and significantly related to REIT equity returns. Lastly, I consider the impact of market access during the period of the financial crisis of 2007-2009. The results are robust and hold both during and outside the financial crisis.

The paper is organized as follows. Section 2 discusses prior literature and formulates the hypotheses, Section 3 describes the database of individual loans and REITs mortgage indebtedness. Section 4 provides methodology and results on factors impacting interest rates, Section 5 provides results on REIT returns and the paper concludes in Section 6.

7 Literature Overview and Formulation of Hypotheses

Real Estate Investment Trusts are an anomaly when it comes to the public debt markets. Faulkender and Petersen (2006) showed that the contributing factors to public debt issuance for non-REIT firms are size, age, market awareness and banking relationships. They also showed that regular corporations issue public debt in order to access and increase leverage. Hardin III and Wu (2010) found that REITs with banking relationships built via lines of credit are more likely to access the public debt markets and that REITs with public debt have lower leverage. The finding is intuitive since REIT bond covenants contain leverage restrictions, typically 60% Total Debt to Assets and 40% Secured Debt to Assets.\(^8\) The distinction between the two findings is also chronological -

\(^8\)2014 Wells Fargo REIT Covenant Report
regular firms issue bonds in order to increase leverage via public debt and REITs decrease their leverage in order to qualify for access to the public debt markets. This is because unlike regular firms, REITs, by virtue of having tangible assets on their balance sheets, are not debt constrained. REITs even at the IPO stage are already heavily leveraged with mortgages, as their entire asset base consists of collateral that can be pledged for secured debt. Recently the question of public debt issuance has gathered more attention as REITs issued a record setting $30.5 billion in unsecured bonds in 2014 (CRE). The driving cause, as a 2014 publication by NAREIT argues, is that Unsecured debt has become the choice of financing for many REITs, given its flexibility and lower cost. While the current low interest rate environment on corporate bonds is quite possibly a valid potential explanation (Ooi et al. (2010) found significant evidence of market timing for REITs when considering SEOs vs public debt issues), another potential reason is that REITs that had no access to the bond market had a harder time in the financial crisis of 2007-2009. Rajan (1992) has predicted that at certain times of distress a company would not be able to take on bank debt [mortgage] but could still access arms length debt [bonds]. Sun et al. (2014) have pointed out the problems REITs could encounter as a result of mismanaged debt during the financial crisis, finding significant negative return consequences that they attributed to over-leveraging. While the leverage explanation is a very strong finding, it may not tell the whole story, as debt composition could be the underlying cause. It could be that REITs without public debt market access, when faced with the recession were unable to refinance their mortgages, but the ones with market access could still issue bonds. This is especially likely since a secured debt lenders underwriting of loan terms is based on current market value. Bond issuance has leverage conditions that are tied to historical acquisition price, which would be a benefit in a weak economic environment.

Prior literature shows that REITs do not access public debt markets to increase leverage, thus the reasons for public debt market access have to differ for REITs vs non-REITs. This paper assesses the true costs and benefits for REITs of obtaining access to the public debt market vis-a-vis cost of debt and company returns. Rajan (1992) has pointed out the information advantage banks
have and has shown that banks charge a premium for their monitoring activity that companies may not always want to pay. Hale and Santos (2009) find that consistent with the hold up theory of bank debt, for non-REIT firms, issuing bonds lowers their cost of capital. Non-REIT firms however are opaque borrowers and accessing the bond market provides an additional level of visibility and disclosure. REITs, on the contrary, with their transparent collateral would be subject to less disclosure with unsecured bonds.

Relevant prior research has also been done in the areas of heterogeneity of debt. Rauh and Sufi (2010), Colla et al(2013) and Cvijanovic (2014) have explored the heterogeneity of debt for non-REIT firms and have found that smaller, debt constrained firms rely on secured borrowings. Morellec (JFE 2001) finds that pledging part of the firms assets as collateral increases firm value. Santos and Winton (2008) claim that bank dependent, financially constrained borrowers get ”held up” by lenders and have to pay higher interest rates. Hale and Santos (2009) show that non-REIT firms obtain a savings on their bank borrowings subsequent to obtaining a debt rating. While Hardin and Wu (2010) have shown that REITs with banking relationships are more likely to issue public debt and Ooi et al (2008) showed that REITs engage in market timing of debt and equity markets, the impact of accessing public debt markets has not been studied for REITs.

Prior research on real estate loans such as Titman et al. (2005) has focused on interest rate determinants, using data from the CMBS market. The advantage of their studies is the large number of loan and property characteristics available; however their dataset did not provide borrower characteristics. My paper contributes and supplements the existing literature in several ways. I build upon the general literature on heterogeneity of debt as well as prior REIT findings and empirically examine the determinants of debt pricing and the impact of debt choice (pledging collateral) on company returns. First, I compare the terms of secured and unsecured debt for a uniform group of borrowers. Second, I assess the importance of borrower characteristics (vs collateral characteristics) on the cost of debt across multiple types of debt (vs studies focused solely on credit lines,
bonds or CMBS issuances). Third, I consider the impact of a public market access on REITs cost of borrowing and subsequently, performance as measured by market returns.

In my prior work, *Impact of Bank Screening on Equity REIT Risk*, I demonstrate that utilizing secured debt lowers a company's idiosyncratic risk. Secured debt lenders monitor the ongoing value of the asset pledged and prevent the firm from selling assets. As such, allocation to secured debt reduces the default probability and preserves liquidation value. Monitoring loans is one of essential services provided by lenders Rajan (1992). Jimnez et al. (2006) argue that internal collateral is useful in solving asset-substitution problems (Smith and Warner, 1979) and under-investment problem (Stulz and Johnson, 1985). Internal collateral can only be effective if its value can be monitored (Rajan and Winton, 1995), which in the case of real estate collateral is feasible. Mortgages are highly monitored, as a function of the collateral aspect and financial reporting covenants. This leads to my first hypothesis:

**Hypothesis 1:** A secured loan, ie monitored debt, will have a higher interest rate than its unsecured counterpart

Cross-monitoring as described by Booth (1992) and recommended by Brown and Riddiough (2003) lowers monitoring costs as a result of information produced by another claimant. Mortgage debt implies that the mortgaged assets are monitored by lenders as they are their only collateral (the loans being non-recourse to the rest of the company’s assets). The expectation is then that the more assets of a company are mortgaged, the closer its operations are monitored. Cross-monitoring Booth (1992) is one lender benefiting from the monitoring performed by other lenders. Following this logic, firms with outstanding monitored loans would incur lower interest rates on their subsequent borrowings. This leads to the second hypothesis:

**Hypothesis 2:** Secured lenders provide a certification benefit. As such, a higher portion of
tal debt allocated to mortgages would result in a lower interest rate on future borrowings, both secured and unsecured. Conversely, access to unmonitored public debt increases the cost of bank debt.

REITs using unsecured debt are subject to less monitoring. In absence of lender oversight, REITs are enabled to take on projects of higher risk. In equilibrium and with efficient markets, all firms generate equivalent risk-adjusted rates of return. Thus firms that utilize non-monitored public unsecured debt and are thus enabled to take on higher risk projects would generate higher returns. Other firms pledge collateral to access leverage and are subject to lender monitoring of their investments, thus limited in the riskiness of their investments. This leads to my final hypothesis:

**Hypothesis 3:** REITs with public debt market access take on higher risk and earn a higher return.

Through committing their assets as collateral (via mortgages) REITs exchange project risk for leverage to increase their returns. In this scenario, firms predominantly financed using corporate level, unsecured debt take on higher risk projects (assets) as compared to firms predominantly financed using collateralized debt.

Capital structure has been previously addressed by numerous studies as outlined by Graham and Leary (0011), while heterogeneity of debt has only recently been examined by Colla et al. (2013) by using an SP Capital IQ sample of loans. I supplement SP Capital IQ data with a hand collected sample of mortgage balances for REITs to empirically test my hypotheses by examining the costs of various debt types as well as the impact of market access on REIT returns. The data overview is provided in the next section.

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9Letdin (2014) empirically demonstrates this effect
8 Data Overview

To examine the mechanism by which interest rates, collateral and company returns are related, I use a loan level dataset from SP Capital IQ. The sample consists of publicly traded equity REITs and follows loans originated from 2000 to 2012. Duplicate observations (identical loan quarters gathered from different reports) were omitted as well as non-US dollar denominated debt (approximately half a percent of the sample). A small number of observations were not classified by debt type (21 in count), of these 13 were classified based on the text description provided and the remaining 8 omitted. A weakness of the dataset is that SP Capital IQ only tracks the surviving company, thus instances where a merger was re-issued as a new company only track the acquiring firm from the moment it issued its own REIT status. REIT level financial operating information was obtained from SNL. A large share of observations of the main variable of interest, ie total mortgage indebtness, was substantially absent from data. SNL reports a field for Mortgages and Notes for 19,293 company quarters for 2000-2012. After quarters during which a company was either not operational or did not have REIT status were dropped, 7,098 company quarters remained with 2,654 missing observations. A handful of REITs focusing on timber or other non-traditional lines of business were omitted. Companies with less than one year of observations were excluded, as well as those that did not break down their debt composition. Companies that were either acquired or otherwise defunct prior to roughly 2005 had no data available and many companies only had annual observations prior to 2004. The resulting missing 1,744 observations were hand collected from quarterly reports. Company ratings were obtained from CRSP. CMBS spreads were obtained from Bloomberg. Moody’s corporate bond spreads, Libor, treasuries and 30 years mortgage rates were obtained from the Federal Reserve. The Moodys/RCA Commercial Property Price Index for real estate property prices at a national level was used in explaining company returns. Insider ownership information was obtained from Thomson Reuters (Forms 3, 4, 5 and 144). The resulting matched sample consists of 187 companies with 15,797 unique debt issuances and a total of 35,641 observations.
8.1 Sample Description

The types of outstanding loans extended to REITs are presented in Table 18. At first glance it may appear that the primarily recourse and unsecured Debentures and Notes Payable are the largest part of total debt since the average loan amount is over $200 million. However, the total volume of long term debt is almost evenly allocated between primarily recourse and unsecured Debentures and Notes Payable and various non-recourse and secured mortgage instruments consisting of Mortgage Bonds, Mortgage Loans and Mortgage Notes, at roughly $1.7 trillion each. Since some observations are available for the same loan over several quarters, the amount is not representative of the volume outstanding at any one point in time. The loan term reflected in the last column is the average remaining term by each type of loan, at the time of quarterly report issuance. Bonds have the longest term of nearly 15 years and lines of credit the shortest, with slightly over 3 years. The highest average interest rate of 8.5% is on Capital Leases, a small portion of the sample with only 95 observations and the lowest average interest rate is on Revolving Credit of 3.7%.

Table 19 provides a break down of loans by collateral and whether or not the borrower had public debt market access. Panel A demonstrates the cost of loans by type of debt, separated by REITs with and without market access. Following Faulkender and Petersen (2006) I use whether or not a firm has a Debt Rating as a proxy of market access. Debentures for firms without market access consist primarily of private placement and the majority can be attributed to one REIT, Monmouth Real Estate Investment Corp (NYSE: MNR). In all but Revolving Credit and Debentures, the cost of borrowing is higher for REITs with market access. An important note is that while firms with market access issue notes payable and debentures, they still substantially rely on mortgages with over 8,000 mortgage borrowings outstanding. Panel B illuminates another source of the difference in interest rates, by separating the secured vs unsecured debt allocation. The cheaper borrowings for firms with public access are senior unsecured bonds and unsecured lines of credit, which have been shown to work as a stepping stone to unsecured bonds (Hardin III and Wu, 2010). Secured debt is almost universally more expensive than unsecured debt, as a function of monitoring pro-
vided by the lender (Graham, 2000). Table 20 provides summary statistics at the REIT level. On average, 45.6% of observations have a Debt Rating. The average Leverage is 44%, of which 59% is allocated to Mortgages. The average return is close to zero, reflective of the time period from the pre-financial crisis growth, the subsequent decline during the crisis and partial recovery.

9 Interest Rate Findings

Table 21 provides the baseline OLS regression results. The dependent variable is Interest Rate, observed on each individual borrowing. The independent variables are SECURED, a binary variable for each loan, and DEBTRATING, a binary variable that serves as a proxy for market access at the company/quarter level. As could be expected from an overview of the data in Section 3, a secured loan incurs a higher interest rate and a REIT with market access also incurs a higher interest rate. Thus the results support both Hypothesis 1, that secured debt is more expensive and Hypothesis 2, that access to unsecured debt increases the cost of borrowing.

However, a lot of the interest rate pricing would be driven by loan characteristics. The available loan level controls are included with results reported in Table 22. A shortcoming of the dataset is that the loan to value, net operating income and tenancy information are not available at the loan level. Similar to findings of interest rates on unsecured debt borrowings reported by Brown and Riddiough (2003), Interest Rates are found to be lower for larger loans, and higher for loans of longer maturity. Column 2 includes controls for macroeconomic conditions. UBAA is an average of BAA corporate credit spreads for that quarter, provided by Bloomberg. U30MORTG is the average 30 year mortgage interest rate for the quarter, provided by St. Louis Federal Reserve. Column 3 shows results including standard errors clustered by firm. The findings show that loan term is no longer significant, while having market access and obtaining lender monitoring remains positive and statistically significant.

Next I explore which REIT firm-level characteristics contribute to their cost of borrowing, with
the results shown in Table 23. Due to high multicollinearity among the independent variables, LEVERAGE, FFOovTA, MB, MORTGAGE, BETA and SIZE are included separately in specifications 2 through 5. SIZE is calculated as a natural log of market value. The market value of the company is determined by subtracting the book value of equity from total assets and adding back the market value of equity. LEVERAGE is calculated as Total Debt divided by Market Value. MB serves as a measure of growth opportunities and is calculated as market value of total assets divided by book value of total assets. Daily returns obtained from CRSP are used to estimate quarterly Betas for each REIT. The Beta serves as a proxy for REIT risk. MORTGAGE is defined as the proportion of Mortgage (SNL data supplemented with hand collected sample) to Total Debt each quarter. FFOovTA serves as a measure of profitability, and is calculated as funds from operations (FFO) scaled by Total Assets. The reason for using this measure is that NOI is not customarily used for REITs due to the substantial depreciation expense associated with real estate assets. Column 1 includes controls for loan type, as shown in Table 1, and for Property Type concentration at the REIT level, as provided by SNL. Column 2 includes LEVERAGE, which we would expect to have a positive effect on interest rates, however after controlling for loan type and time effect it is not significant. Subsequent results for estimating returns show that leverage is significant in explaining returns. Columns 3 and 4 include measures of profitability and growth opportunities, respectively and both have a positive and significant relationship with interest rates. To consider that a higher allocation towards monitored debt would lower interest rates on subsequent borrowings, I include MORTGAGE as an explanatory variable in Column 5. Consistent with Hypothesis 2, it is negative and highly statistically significant. This finding further supports the explanation that lenders charge a premium to monitor loans for the benefit of unsecured borrowers and equity holders, and this premium is lower when a higher proportion of collateral is monitored. There could be several additional explanations for this behavior. From the mortgage providers perspective, without unsecured public debt, all of a REIT’s investment into a project would come from equity. With the introduction of unsecured public debt, the equity position has been diluted by unsecured borrowings and a REIT thus has increased moral hazard. Additionally, the lack of monitoring can
enable the REIT to pursue higher risk investments. Column 6 includes BETA, as a control for risk at the REIT level. Consistent with intuition, it is positively and significantly correlated with loan interest rates. Column 7 includes REIT SIZE, which is negative and significant, as well as REIT level fixed effects. SECURED and DEBTRATING remain positive and significant throughout all specifications. LOANTERM remains inversely related to interest rates and significant throughout.

10 REIT Returns Findings

Next I consider the return implications of market access to test my third hypothesis, that REITs would earn a higher return with less lender monitoring. I first consider the means differences in REIT returns by quarter, with the results reported in Table 24. REITs with market access earn a higher return in 44 out of 48 quarters, with 25 of those statistically significant. The average difference over the entire sample period is a statistically significant 8.56%. Table 25 provides the baseline results, that market access is positive and significant in explaining return. Table 26 reports multivariate results. Columns 2 and 3 include corporate performance controls, while columns 4 through 6 include macroeconomic controls. DEBTRATING remains a positive and significant predictor of return. Risk, as measured by BETA, is positive and significant in explaining return in all specifications. Profitability, as shown by FFOovTA, and Growth Opportunities (MB) are both positive and statistically significant.

Due to the fact that the decision to enter public debt markets is not exogenous, I move on to 2SLS analysis where I use a predicted value of market access to explain returns. I use Insider Ownership in the first stage to predict whether or not a REIT has market access, in addition to other control variables. From industry conversations, insiders such as managers would be opposed to taking on unsecured debt. Unsecured debt not only requires an additional level of reporting and information disclosure, but also presents an increase in bankruptcy risk since unlike mortgages, public debt is recourse to the company. Prior studies of insider ownership have found that entrenched managers are risk averse (Ghosh et al., 2011) and as such would we would expect insider ownership to have
a negative relationship with recourse debt. Older REITs are more likely to issue bonds, consistent with Faulkender and Petersen (2006). REITs with higher profitability, as proxied for by FFO scaled by Total Assets, are more likely to access the public debt market. The equation is estimated using OLS [unreported] and probit, with nearly identical results. The resulting predicted variable is titled MARKETACCESS. Table 28 provides the second stage results. Column 3 includes control variables and Column 4 includes controls for REIT property type. Quarter dummies are included in all specifications to control for time effects. Column 4 considers the difference in return between firms. MARKETACCESS remains a positive and significant in explaining returns.

Since the sample period includes a great financial crisis of 2007 to 2009, and it has been shown to impact REIT performance most recently by Sun et al. (2014), I bifurcate the sample into the period during and outside of the financial crisis with the results shown in Table 29. I use Sun et al. (2014) time period as the definition of the financial crisis. Of note is the varying impact of Leverage in returns, since Leverage was negative and significant in the prior regressions. Outside the crisis time window, Leverage is positive and significant in predicting returns. During the crisis however, it is negative and significant. Market Access remains a positive and significant predictor of REIT returns both during and outside the financial crisis.

11 Conclusion

In this paper I explore various types of debt REITs use, the costs associated with each type, and the impact of market access on the stock returns of a company. I use a data set of individual loan borrowings to empirically assess the factors that impact interest rates for REITs. I find that in accordance with prior literature, monitoring is costly and a secured loan has a higher interest rate than an unsecured loan. I also find support for Booth (1992) prediction by showing that firms with greater monitoring of their loans incur lower interest rates. The hold up argument is refuted for REITs - I find that contrary to regular firms, REITs that issue bonds face a higher cost of borrowing in other sources of capital. The findings are robust to controls for loan, REIT level, and macroeco-
nomic variables. I consider the impact of public debt market access on REIT performance and find that REITs with bond access consistently outperform those without, as measured by stock returns. There is evidence that REITs with market access are able to pursue higher risk and more profitable projects and consistently generate a higher return.

Contrary to some evidence that it may be beneficial for REITs to reduce leverage (Sun et al., 2014), REITs are unlikely to do so, given that outside periods of crisis REITs reap the benefits of leverage in higher returns. The recent trend of issuing public bonds however is likely to continue, as despite the higher cost of other borrowings, the freedom of unencumbered asset operations and multiple sources of capital pays off in returns, both during periods of economic expansion and bust. The scenario when a borrower would be unable to borrower from the bank but could borrow from the bond market described by Rajan (1992), partially captured by Sun et al. (2014) and driving REITs to the bond market in 2014 could be explained by the structure of bonds covenants (2014 Wells Fargo REIT Covenant Report). Bond Leverage covenants are tied to historical cost of property. Mortgages are tied to current market values. If values fall, a REIT would not be able to refinance a mortgage however would still be able to abide by their bond covenants.
Table 1: Summary Statistics

The table presents summary statistics for the sample of firm quarterly observations from 2000 Q1 to 2012 Q4. Size is calculated as a natural log of Market Value. Market Value is Calculated as Total Assets less Book Equity plus Market Equity. Leverage is calculated as Total Debt divided by Market Value. Mortgage is a percentage of Total Debt that is Mortgages. Mortgage Balances were collected from SNL and the missing observations (30%) were hand collected from quarterly reports. Profitability is FFO scaled by Total Assets. Equity Issue, Equity Purchase, Unsecured Bond Issue and Debt Rating are a 0/1 variables. Debt Rating service as a proxy for whether or not the REIT has public debt market access. Debt Ratings were obtained from CRSP and provided by Standard and Poors.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Max.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortgage</td>
<td>0.605</td>
<td>0.331</td>
<td>0</td>
<td>1</td>
<td>6188</td>
</tr>
<tr>
<td>Size</td>
<td>14.306</td>
<td>1.443</td>
<td>8.948</td>
<td>18.11</td>
<td>6188</td>
</tr>
<tr>
<td>Leverage</td>
<td>0.447</td>
<td>0.166</td>
<td>0</td>
<td>0.935</td>
<td>6188</td>
</tr>
<tr>
<td>Age</td>
<td>38.379</td>
<td>29.545</td>
<td>0</td>
<td>170</td>
<td>6188</td>
</tr>
<tr>
<td>MB</td>
<td>1.22</td>
<td>0.327</td>
<td>0.393</td>
<td>3.653</td>
<td>6188</td>
</tr>
<tr>
<td>Profitability</td>
<td>0.013</td>
<td>0.021</td>
<td>-0.476</td>
<td>0.742</td>
<td>6162</td>
</tr>
<tr>
<td>EquityIssue</td>
<td>0.172</td>
<td>0.378</td>
<td>0</td>
<td>1</td>
<td>6188</td>
</tr>
<tr>
<td>EquityRepurchase</td>
<td>0.089</td>
<td>0.285</td>
<td>0</td>
<td>1</td>
<td>6188</td>
</tr>
<tr>
<td>BondIssue</td>
<td>0.069</td>
<td>0.254</td>
<td>0</td>
<td>1</td>
<td>6188</td>
</tr>
<tr>
<td>DebtRating</td>
<td>0.412</td>
<td>0.492</td>
<td>0</td>
<td>1</td>
<td>6188</td>
</tr>
</tbody>
</table>
Table 2: REIT Mortgage Use and Leverage

The table shows the quarterly summary statistics. The total number of unique REITs in the sample is 216. The number of REITs for each quarter is shown in column 4. Mortgage is the mean proportion of Mortgage Indebtness to Total Debt across all REITs for the quarter, shown in Column 3. Instances of Bond and Equity Issues are shown in Column 5 and 6 respectively, obtained from SNL and compensated with hand collected data from Lexus Nexis.

<table>
<thead>
<tr>
<th>Year/Quarter</th>
<th>n</th>
<th>Mean Mortgage</th>
<th>Mean Leverage</th>
<th>Bond Issue</th>
<th>Equity Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000Q4</td>
<td>120</td>
<td>57%</td>
<td>49%</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2001Q1</td>
<td>123</td>
<td>57%</td>
<td>48%</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>2001Q2</td>
<td>124</td>
<td>58%</td>
<td>46%</td>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>2001Q3</td>
<td>122</td>
<td>57%</td>
<td>46%</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>2001Q4</td>
<td>120</td>
<td>57%</td>
<td>47%</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>2002Q1</td>
<td>121</td>
<td>58%</td>
<td>47%</td>
<td>3</td>
<td>19</td>
</tr>
<tr>
<td>2002Q2</td>
<td>121</td>
<td>60%</td>
<td>45%</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>2002Q3</td>
<td>120</td>
<td>59%</td>
<td>46%</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>2002Q4</td>
<td>110</td>
<td>59%</td>
<td>48%</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>2003Q1</td>
<td>118</td>
<td>60%</td>
<td>49%</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>2005Q1</td>
<td>133</td>
<td>66%</td>
<td>41%</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>2005Q2</td>
<td>135</td>
<td>65%</td>
<td>42%</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>2005Q3</td>
<td>135</td>
<td>66%</td>
<td>40%</td>
<td>8</td>
<td>22</td>
</tr>
<tr>
<td>2005Q4</td>
<td>134</td>
<td>64%</td>
<td>41%</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>2006Q1</td>
<td>131</td>
<td>64%</td>
<td>40%</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td>2006Q2</td>
<td>133</td>
<td>64%</td>
<td>40%</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>2006Q3</td>
<td>127</td>
<td>63%</td>
<td>40%</td>
<td>22</td>
<td>17</td>
</tr>
<tr>
<td>2006Q4</td>
<td>119</td>
<td>63%</td>
<td>39%</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>2008Q1</td>
<td>110</td>
<td>59%</td>
<td>46%</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>2008Q2</td>
<td>108</td>
<td>58%</td>
<td>45%</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>2008Q3</td>
<td>109</td>
<td>58%</td>
<td>46%</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>2008Q4</td>
<td>107</td>
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<td>55%</td>
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<td>12</td>
</tr>
<tr>
<td>2009Q1</td>
<td>107</td>
<td>59%</td>
<td>60%</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>2009Q2</td>
<td>107</td>
<td>60%</td>
<td>56%</td>
<td>5</td>
<td>49</td>
</tr>
<tr>
<td>2009Q3</td>
<td>107</td>
<td>61%</td>
<td>52%</td>
<td>11</td>
<td>33</td>
</tr>
<tr>
<td>2009Q4</td>
<td>108</td>
<td>60%</td>
<td>50%</td>
<td>6</td>
<td>31</td>
</tr>
<tr>
<td>2010Q1</td>
<td>111</td>
<td>59%</td>
<td>47%</td>
<td>14</td>
<td>34</td>
</tr>
<tr>
<td>2010Q2</td>
<td>113</td>
<td>60%</td>
<td>43%</td>
<td>12</td>
<td>46</td>
</tr>
<tr>
<td>2010Q3</td>
<td>115</td>
<td>61%</td>
<td>44%</td>
<td>14</td>
<td>39</td>
</tr>
<tr>
<td>2010Q4</td>
<td>118</td>
<td>60%</td>
<td>43%</td>
<td>14</td>
<td>39</td>
</tr>
<tr>
<td>2011Q1</td>
<td>120</td>
<td>62%</td>
<td>41%</td>
<td>10</td>
<td>49</td>
</tr>
<tr>
<td>2011Q2</td>
<td>121</td>
<td>61%</td>
<td>41%</td>
<td>11</td>
<td>47</td>
</tr>
<tr>
<td>2011Q3</td>
<td>121</td>
<td>61%</td>
<td>43%</td>
<td>3</td>
<td>37</td>
</tr>
<tr>
<td>2012Q3</td>
<td>123</td>
<td>58%</td>
<td>41%</td>
<td>19</td>
<td>47</td>
</tr>
<tr>
<td>2012Q4</td>
<td>121</td>
<td>56%</td>
<td>41%</td>
<td>15</td>
<td>34</td>
</tr>
<tr>
<td>All</td>
<td>216</td>
<td>60%</td>
<td>45%</td>
<td>430</td>
<td>1065</td>
</tr>
</tbody>
</table>
Table 3: Mortgage Use in REITs
The table presents results where the dependent variable is Mortgages as Percent of Total Debt. Column 1 and 2 provide OLS results. Leverage and Credit Line Utilization are both lagged by one quarter. Column 3 provides results of a time series (firm fixed effects) regression. Column 4 provides results of cross sectional regression. Debt Rating is a public debt market proxy and is a 0/1 variable of whether the company has a bond rating. Size is Log of Total Assets. Profitability is FFO scaled by Total Assets. Equity Issue and Bond Issue are 0/1 variables.

<table>
<thead>
<tr>
<th></th>
<th>(1) OLS</th>
<th>(2) OLS</th>
<th>(3) Time Series</th>
<th>(4) Cross Sectional</th>
</tr>
</thead>
<tbody>
<tr>
<td>L.Leverage</td>
<td>0.705***</td>
<td>0.509***</td>
<td>0.202***</td>
<td>0.837***</td>
</tr>
<tr>
<td></td>
<td>(29.46)</td>
<td>(25.42)</td>
<td>(9.87)</td>
<td>(8.11)</td>
</tr>
<tr>
<td>DebtRating</td>
<td>-0.362***</td>
<td>-0.216***</td>
<td>-0.323***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-53.51)</td>
<td>(-18.81)</td>
<td>(-8.00)</td>
<td></td>
</tr>
<tr>
<td>L.CreditLineUse</td>
<td>-0.128***</td>
<td>-0.421***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-16.01)</td>
<td>(-6.03)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profitability</td>
<td>0.114</td>
<td>3.139*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.08)</td>
<td>(2.37)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>-0.0167**</td>
<td>0.0295*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-2.81)</td>
<td>(2.28)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.000433*</td>
<td>0.000119</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-2.04)</td>
<td>(0.20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EquityIssue</td>
<td>0.0267***</td>
<td>-0.0352</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.09)</td>
<td>(-0.33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BondIssue</td>
<td>-0.00367</td>
<td>-0.957***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.48)</td>
<td>(-4.49)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quarter</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Firm</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>5949</td>
<td>5949</td>
<td>5925</td>
<td>5925</td>
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<tr>
<td>R²</td>
<td>0.127</td>
<td>0.411</td>
<td>0.114</td>
<td>0.573</td>
</tr>
</tbody>
</table>

t statistics in parentheses
* p < 0.05, ** p < 0.01, *** p < 0.001
Table 4: Property Type Risk Characteristics

The table presents an overview of property type classifications as provided by SNL. These were assigned Risk Type Characteristics based on the major property type as shown. The Property Quarter observations reflected are for assets acquired from 2000 to 2012 by the REITs defined in the sample. Each property is observed for the time period it is owned by the REIT. The sample represents 60,160 individual properties.

<table>
<thead>
<tr>
<th>SNL Property Type</th>
<th>Risk Type</th>
<th>Number of Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-family</td>
<td>1</td>
<td>44,916</td>
</tr>
<tr>
<td>Office</td>
<td>2</td>
<td>71,094</td>
</tr>
<tr>
<td>Regional Mall</td>
<td>3</td>
<td>8,002</td>
</tr>
<tr>
<td>Retail: Other</td>
<td>3</td>
<td>70,739</td>
</tr>
<tr>
<td>Shopping Center</td>
<td>3</td>
<td>60,600</td>
</tr>
<tr>
<td>Industrial</td>
<td>4</td>
<td>41,936</td>
</tr>
<tr>
<td>Health Care</td>
<td>5</td>
<td>61,084</td>
</tr>
<tr>
<td>Hotel</td>
<td>5</td>
<td>16,533</td>
</tr>
<tr>
<td>Manufactured home</td>
<td>5</td>
<td>7,755</td>
</tr>
<tr>
<td>Multi-use</td>
<td>5</td>
<td>5,346</td>
</tr>
<tr>
<td>Self-Storage</td>
<td>5</td>
<td>40,537</td>
</tr>
<tr>
<td>Specialty</td>
<td>5</td>
<td>47,899</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>476,441</td>
</tr>
</tbody>
</table>
Table 5: MSA Type Risk Characteristics

Property location was obtained from SNL. Standard Metropolitan Statistical Area population numbers were obtained from the 2000 Census. Cities were sorted into five groups by sMSA population, with cut offs provided in the table below.

<table>
<thead>
<tr>
<th>Risk</th>
<th>MSA Description</th>
<th>MSA Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Population Gateway MSAs &gt; 5 million residents</td>
<td>New York, Los Angeles etc</td>
</tr>
<tr>
<td>2</td>
<td>Population MSAs &gt; 5 million residents</td>
<td>Chicago, Dallas etc</td>
</tr>
<tr>
<td>3</td>
<td>1 million residents &lt; Population MSA &lt; 5 million</td>
<td>Includes Houston, Atlanta, Phoenix</td>
</tr>
<tr>
<td>4</td>
<td>500,000 residents &lt; Population MSA &lt; 1 million</td>
<td>El Paso, TX; Syracuse, NY etc</td>
</tr>
<tr>
<td>5</td>
<td>500,000 &lt; Population MSA</td>
<td>Reno, NV; Flint, MI etc</td>
</tr>
</tbody>
</table>
Table 6: Property Summary Statistics

Panel A: Property Observations
The table presents summary statistics for the sample of property firm quarterly observations for properties acquired from 2000 Q1 to 2012 Q4. The data obtained from SNL. The sample reflects only properties located in USA. Properties from Puerto Rico were excluded. Property Type Risk and MSA Type Risk are assigned values from 1 to 5, with 1 being the lowest risk. PortfolioBuy, PortfolioSale and Merger Y/N, and Mortgage Dummy are binary variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSARiskType</td>
<td>3.016</td>
<td>1.26</td>
<td>476328</td>
</tr>
<tr>
<td>PropertyRiskType</td>
<td>3.502</td>
<td>1.366</td>
<td>476441</td>
</tr>
<tr>
<td>PortfolioBuy</td>
<td>0.467</td>
<td>0.499</td>
<td>476441</td>
</tr>
<tr>
<td>PortfolioSale</td>
<td>0.217</td>
<td>0.413</td>
<td>299458</td>
</tr>
<tr>
<td>MergerYN</td>
<td>0.134</td>
<td>0.341</td>
<td>476441</td>
</tr>
<tr>
<td>MortgDummy</td>
<td>0.088</td>
<td>0.283</td>
<td>476441</td>
</tr>
</tbody>
</table>

Panel B: Probability of Property Encumbrance
This table provides the results of a t-test of property risk characteristics for assets with and without encumbrances. Property Type Risk and MSA Type Risk are assigned values from 1 to 5, with 1 being the lowest risk. The risk characteristics are defined in the Methodology section.

<table>
<thead>
<tr>
<th>Variable</th>
<th>diff.</th>
<th>t statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSARiskType</td>
<td>0.217***</td>
<td>(33.60)</td>
</tr>
<tr>
<td>PropertyRiskType</td>
<td>0.679***</td>
<td>(98.02)</td>
</tr>
<tr>
<td>PortfolioBuy</td>
<td>-0.0442***</td>
<td>(-17.31)</td>
</tr>
<tr>
<td>PortfolioSale</td>
<td>-0.0367***</td>
<td>(-15.36)</td>
</tr>
<tr>
<td>MergerYN</td>
<td>-0.0448***</td>
<td>(-25.70)</td>
</tr>
</tbody>
</table>

\(N\) 476441

* t statistics in parentheses
* \(p < 0.05\), ** \(p < 0.01\), *** \(p < 0.001\)
Table 7: Probability of Property Encumbrance

This table provides probit results where the dependent variable is a binary variable indicating whether or not a given asset is encumbered by a mortgage. Encumbrance data is provided by SNL. Property Type Risk and MSA Type Risk are assigned values from 1 to 5, with 1 being the lowest risk. Property Type Risk definition is provided by Table 4, where 1 is Multifamily, 2 Office, 3 Retail, 4 Industrial and 5 Other. MSA Type Risk Definition is provided by Table 5. Portfolio Disposition, Portfolio Acquisition and Merger Y/N are binary variables. Quarter controls are included in all specifications.

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mortgage</td>
<td>Mortgage</td>
</tr>
<tr>
<td>MortgDummy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1b. Property Type Risk</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(.)</td>
<td>(.)</td>
</tr>
<tr>
<td>2. Property Type Risk</td>
<td>0.386***</td>
<td>0.386***</td>
</tr>
<tr>
<td></td>
<td>(37.29)</td>
<td>(37.29)</td>
</tr>
<tr>
<td>3. Property Type Risk</td>
<td>0.332***</td>
<td>0.332***</td>
</tr>
<tr>
<td></td>
<td>(34.64)</td>
<td>(34.64)</td>
</tr>
<tr>
<td>4. Property Type Risk</td>
<td>-0.252***</td>
<td>-0.252***</td>
</tr>
<tr>
<td></td>
<td>(-18.63)</td>
<td>(-18.63)</td>
</tr>
<tr>
<td>5. Property Type Risk</td>
<td>-0.448***</td>
<td>-0.448***</td>
</tr>
<tr>
<td></td>
<td>(-43.01)</td>
<td>(-43.01)</td>
</tr>
<tr>
<td>MSA Type Risk</td>
<td></td>
<td>-0.0695***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-33.63)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.842***</td>
<td>0.0586</td>
</tr>
<tr>
<td></td>
<td>(-15.95)</td>
<td>(1.16)</td>
</tr>
<tr>
<td>qtr</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>476441</td>
<td>476328</td>
</tr>
</tbody>
</table>

z statistics in parentheses
* p < 0.05, ** p < 0.01, *** p < 0.001
Table 8: Probability of Property Encumbrance with Controls

This table provides results where the dependent variable is a binary variable indicating whether or not a given asset is encumbered by a mortgage. The regression is estimated using Probit. Encumbrance data is provided by SNL. Property Type Risk and MSA Type Risk are assigned values from 1 to 5, with 1 being the lowest risk. Property Type Risk definition is provided by Table 4. MSA Type Risk Definition is provided by Table 5. Portfolio Disposition, Portfolio Acquisition and Merger Y/N are binary variables. Quarter controls are included in all specifications.

<table>
<thead>
<tr>
<th></th>
<th>(1) MortgDummy</th>
<th>(2) MortgDummy</th>
<th>(3) MortgDummy</th>
</tr>
</thead>
<tbody>
<tr>
<td>MortgDummy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property Type Risk</td>
<td>-0.132***</td>
<td>-0.128***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-55.99)</td>
<td>(-53.94)</td>
<td></td>
</tr>
<tr>
<td>Portfolio Disposition</td>
<td>0.0719***</td>
<td>0.0955***</td>
<td>0.0746***</td>
</tr>
<tr>
<td></td>
<td>(9.81)</td>
<td>(13.13)</td>
<td>(10.17)</td>
</tr>
<tr>
<td>Portfolio Acquisition</td>
<td>0.112***</td>
<td>0.104***</td>
<td>0.117***</td>
</tr>
<tr>
<td></td>
<td>(16.61)</td>
<td>(15.58)</td>
<td>(17.30)</td>
</tr>
<tr>
<td>Acquired through Merger? Yes/No</td>
<td>0.0598***</td>
<td>0.111***</td>
<td>0.0641***</td>
</tr>
<tr>
<td></td>
<td>(5.96)</td>
<td>(11.10)</td>
<td>(6.38)</td>
</tr>
<tr>
<td>MSA Type Risk</td>
<td>-0.0519***</td>
<td>-0.0354***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-20.80)</td>
<td>(-13.96)</td>
<td></td>
</tr>
<tr>
<td>qtr</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>299458</td>
<td>299356</td>
<td>299356</td>
</tr>
</tbody>
</table>

$z$ statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Table 9: Monitoring and Probability of Property Encumbrance
This table provides probit results where the dependent variable is a binary variable indicating whether or not a given asset is encumbered by a mortgage.

<table>
<thead>
<tr>
<th></th>
<th>(1) est1</th>
<th>(2) est2</th>
<th>(3) est3</th>
</tr>
</thead>
<tbody>
<tr>
<td>MortgDummy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitoring</td>
<td>-0.000329*** (-85.49)</td>
<td>-0.000292*** (-64.79)</td>
<td>-0.000268*** (-58.55)</td>
</tr>
<tr>
<td>Portfolio Disposition</td>
<td>0.0753*** (10.24)</td>
<td>0.132*** (16.57)</td>
<td></td>
</tr>
<tr>
<td>Portfolio Acquisition</td>
<td>0.113*** (16.75)</td>
<td>0.0405*** (5.75)</td>
<td></td>
</tr>
<tr>
<td>Acquired through Merger? Yes/No</td>
<td>0.0888*** (8.83)</td>
<td>0.00864 (0.82)</td>
<td></td>
</tr>
<tr>
<td>MSA Type Risk</td>
<td></td>
<td>-0.0477*** (-18.04)</td>
<td></td>
</tr>
<tr>
<td>1b.Property Type Risk</td>
<td>0 (. )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.Property Type Risk</td>
<td>0.354*** (29.77)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.Property Type Risk</td>
<td>0.495*** (44.37)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.Property Type Risk</td>
<td>-0.247*** (-15.52)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.Property Type Risk</td>
<td>-0.221*** (-17.92)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.0200 (0.39)</td>
<td>-0.744*** (-12.58)</td>
<td>-1.253*** (-20.05)</td>
</tr>
<tr>
<td>qtr</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>474880</td>
<td>297909</td>
<td>297807</td>
</tr>
</tbody>
</table>

z statistics in parentheses
* p < 0.05, ** p < 0.01, *** p < 0.001
Table 10: Total Risk and Mortgage Use
The table presents OLS results where the dependent variable is Total Risk. TotalRisk is defined as the standard deviation of REIT returns calculated quarterly from daily values. Mortgage is the ratio of Mortgage debt to Total Debt (as collected from quarterly reports and SNL), Leverage is the ratio of total debt reported to the market value of the company. The market value of the company is determined by subtracting the book value of equity from total assets and adding back the market value of equity. Debt Rating is a binary variable that indicates whether the company had a debt rating (obtained from Compustat). Age of the company is the latter of a company going public or obtaining REIT status. Size is the natural log of Total Assets. 10 Quarter controls are included in regressions 1, 2 and 4. White’s heteroscedastic consistent standard errors are reported in parenthesis.

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OLS</td>
<td>OLS Controls</td>
<td>Time Series</td>
<td>Cross Sectional</td>
</tr>
<tr>
<td>Mortgage</td>
<td>-0.00469***</td>
<td>-0.00785***</td>
<td>-0.00587***</td>
<td>-0.00850***</td>
</tr>
<tr>
<td></td>
<td>(-6.32)</td>
<td>(-9.04)</td>
<td>(-4.45)</td>
<td>(-3.88)</td>
</tr>
<tr>
<td>Leverage</td>
<td>0.0401***</td>
<td>0.0398***</td>
<td>0.0720***</td>
<td>0.0102*</td>
</tr>
<tr>
<td></td>
<td>(17.52)</td>
<td>(17.36)</td>
<td>(35.49)</td>
<td>(2.22)</td>
</tr>
<tr>
<td>DebtRating</td>
<td>-0.00128</td>
<td>-0.00295*</td>
<td>-0.00258</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-1.96)</td>
<td>(-2.42)</td>
<td>(-1.64)</td>
<td></td>
</tr>
<tr>
<td>FFOovTA</td>
<td>-0.0272</td>
<td>-0.0175</td>
<td>-0.401***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-1.42)</td>
<td>(-1.80)</td>
<td>(-5.43)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.00000620</td>
<td>0.000433***</td>
<td>0.0000223</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.74)</td>
<td>(20.62)</td>
<td>(1.09)</td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>-0.00145***</td>
<td>-0.00650***</td>
<td>-0.000936*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-5.97)</td>
<td>(-10.83)</td>
<td>(-2.15)</td>
<td></td>
</tr>
<tr>
<td>qtr</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>6188</td>
<td>6162</td>
<td>6162</td>
<td>6162</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.173</td>
<td>0.190</td>
<td>0.249</td>
<td>0.284</td>
</tr>
</tbody>
</table>

$t$ statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Table 11: REIT Beta
This table provides OLS results where Beta is estimated using Equation 1 for each REIT/quarter using daily stock prices from CRSP and CRSP value weighted market index. The dependent variable is the REIT stock market return. The CRSP value weighted market index serves as a proxy for market return. The number of observations reflects daily stock prices used to estimate quarterly Beta for each REIT.

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ret</td>
<td></td>
</tr>
<tr>
<td>Market Index</td>
<td>0.927***</td>
</tr>
<tr>
<td></td>
<td>(337.04)</td>
</tr>
<tr>
<td>_cons</td>
<td>0.000588***</td>
</tr>
<tr>
<td></td>
<td>(16.15)</td>
</tr>
<tr>
<td>N</td>
<td>460546</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.198</td>
</tr>
</tbody>
</table>


Table 12: Systematic Risk and Mortgage Use

This table provides OLS results for Equation 2. The dependent variable is Beta, used as a measure of systematic risk, estimated in Equation (1) for each REIT/quarter. T-statistics (in parentheses) are based on White’s heteroscedastic consistent standard errors. Size is calculated as a natural log of Market Value. Market Value is Calculated as Total Assets less Book Equity plus Market Equity. Leverage is calculated as Total Debt divided by Market Value. Mortgage is a percentage of Total Debt that is Mortgages. Profitability is FFO scaled by Total Assets. The estimators include quarter controls in equations 1 and 2. Column 3 includes firm fixed effects.

<table>
<thead>
<tr>
<th></th>
<th>(1) OLS</th>
<th>(2) OLS Controls</th>
<th>(3) Time Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortgage</td>
<td>-0.224***</td>
<td>-0.0385</td>
<td>0.00771</td>
</tr>
<tr>
<td></td>
<td>(-9.76)</td>
<td>(-1.63)</td>
<td>(0.19)</td>
</tr>
<tr>
<td>Leverage</td>
<td>0.512***</td>
<td>0.502***</td>
<td>1.240***</td>
</tr>
<tr>
<td></td>
<td>(7.90)</td>
<td>(8.08)</td>
<td>(19.44)</td>
</tr>
<tr>
<td>Profitability</td>
<td>-0.525</td>
<td>-0.934**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-1.78)</td>
<td>(-3.06)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.000839***</td>
<td>0.0218***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3.35)</td>
<td>(33.02)</td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>0.126***</td>
<td>0.0438*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(23.33)</td>
<td>(2.32)</td>
<td></td>
</tr>
<tr>
<td>qtr</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Observations</td>
<td>6188</td>
<td>6162</td>
<td>6162</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.297</td>
<td>0.366</td>
<td>0.312</td>
</tr>
</tbody>
</table>

$t$ statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Table 13: Idiosyncratic Risk and Mortgage Use

The dependent variable is the residual estimated in Equation (4) for each REIT/quarter. Size is calculated as a natural log of Market Value. Market Value is Calculated as Total Assets less Book Equity plus Market Equity. Leverage is calculated as Total Debt divided by Market Value. Mortgage is a percentage of Total Debt that is Mortgages. Mortgage Balances were collected from SNL and the missing observations (30%) were hand collected from quarterly reports. Profitability is FFO scaled by Total Assets. T-statistics (in parentheses) are based on White’s heteroscedastic consistent standard errors. The estimators include quarter controls in all equations. Column 3 includes REIT level clusters.

<table>
<thead>
<tr>
<th></th>
<th>(1) OLS</th>
<th>(2) OLS Controls</th>
<th>(3) Time Series</th>
<th>(4) Cross Sectional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortgage</td>
<td>-0.0155***</td>
<td>-0.0269***</td>
<td>-0.0225*</td>
<td>-0.0331**</td>
</tr>
<tr>
<td></td>
<td>(-3.36)</td>
<td>(-5.96)</td>
<td>(-2.57)</td>
<td>(-3.08)</td>
</tr>
<tr>
<td>Leverage</td>
<td>0.168***</td>
<td>0.163***</td>
<td>0.271***</td>
<td>0.0150</td>
</tr>
<tr>
<td></td>
<td>(9.11)</td>
<td>(8.85)</td>
<td>(19.59)</td>
<td>(0.57)</td>
</tr>
<tr>
<td>Profitability</td>
<td>-0.236</td>
<td>-0.111</td>
<td>-3.085***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-1.81)</td>
<td>(-1.68)</td>
<td>(-7.31)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.0000483</td>
<td>0.00125***</td>
<td>0.0000818</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.69)</td>
<td>(8.73)</td>
<td>(0.70)</td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>-0.00813***</td>
<td>-0.0275***</td>
<td>-0.00567**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-3.75)</td>
<td>(-6.79)</td>
<td>(-2.61)</td>
<td></td>
</tr>
<tr>
<td>qtr</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>6188</td>
<td>6162</td>
<td>6162</td>
<td>6162</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.064</td>
<td>0.077</td>
<td>0.083</td>
<td>0.311</td>
</tr>
</tbody>
</table>

$t$ statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Table 14: Idiosyncratic Risk and Access to the Public Debt Markets

To verify that access to the public debt markets is not driving the result, REITs without public debt are excluded. The regression shows only REITs with access to the public debt markets (proxied for by whether or not the REIT has a debt rating). Idiosyncratic risk, the residual estimated in Equation (4) is the dependent variable. Size is calculated as a natural log of Market Value. Market Value is Calculated as Total Assets less Book Equity plus Market Equity. Leverage is calculated as Total Debt divided by Market Value. Mortgage is a percentage of Total Debt that is Mortgages. Mortgage Balances were collected from SNL and the missing observations (30%) were hand collected from quarterly reports. Profitability is FFO scaled by Total Assets.

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idiosyncratic Risk</td>
<td></td>
</tr>
<tr>
<td>Mortgage</td>
<td>-0.0265***</td>
</tr>
<tr>
<td></td>
<td>(-3.31)</td>
</tr>
<tr>
<td>Leverage</td>
<td>0.115***</td>
</tr>
<tr>
<td></td>
<td>(3.44)</td>
</tr>
<tr>
<td>Profitability</td>
<td>-1.297*</td>
</tr>
<tr>
<td></td>
<td>(-2.14)</td>
</tr>
<tr>
<td>Age</td>
<td>-0.0000340</td>
</tr>
<tr>
<td></td>
<td>(-0.86)</td>
</tr>
<tr>
<td>Size</td>
<td>-0.00361**</td>
</tr>
<tr>
<td></td>
<td>(-3.08)</td>
</tr>
<tr>
<td>qtr</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>2552</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.137</td>
</tr>
</tbody>
</table>

$t$ statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Table 15: Stage 1. Likelihood of public market access
The first stage regression is estimated using Probit. Debt Rating is a binary dependent variable. Percentinsider is the number of shares owned by management scaled by the total number of shares outstanding. Mortgage is a percentage of Total Debt that is Mortgages.

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Access</td>
<td></td>
<td></td>
</tr>
<tr>
<td>percentinsider</td>
<td>-1.488***</td>
<td>(-4.45)</td>
</tr>
<tr>
<td>Age</td>
<td>0.0364***</td>
<td>(16.35)</td>
</tr>
<tr>
<td>Age Squared</td>
<td>-0.000226***</td>
<td>(-14.13)</td>
</tr>
<tr>
<td>Growth Opportunities</td>
<td>-0.244**</td>
<td>(-3.08)</td>
</tr>
<tr>
<td>Prcntcash</td>
<td>-5.930***</td>
<td>(-7.69)</td>
</tr>
<tr>
<td>uBAA</td>
<td>0.0537</td>
<td>(0.94)</td>
</tr>
<tr>
<td>Mortgage</td>
<td>-3.070***</td>
<td>(-38.36)</td>
</tr>
<tr>
<td>Profitability</td>
<td>0.926</td>
<td>(0.69)</td>
</tr>
<tr>
<td>Lender Survey</td>
<td>-0.00358*</td>
<td>(-2.55)</td>
</tr>
<tr>
<td>Line of Credit Utilization</td>
<td>-1.408***</td>
<td>(-16.04)</td>
</tr>
<tr>
<td>qtr</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>4843</td>
<td></td>
</tr>
<tr>
<td>Pseudo $R^2$</td>
<td>0.404</td>
<td></td>
</tr>
</tbody>
</table>

$t$ statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Table 16: Idiosyncratic Risk and Access to the Public Debt Markets
The fitted values are used in the second stage regression. Idiosyncratic risk, the residual estimated in Equation (4) is the dependent variable. Size is calculated as a natural log of Market Value. Market Value is Calculated as Total Assets less Book Equity plus Market Equity. Leverage is calculated as Total Debt divided by Market Value. Mortgage is a percentage of Total Debt that is Mortgages. Profitability is FFO scaled by Total Assets. T-statistics (in parentheses) are based on White’s heteroscedastic consistent standard errors.

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idiosyncratic Risk</td>
<td></td>
</tr>
<tr>
<td>Pr(DebtRating)</td>
<td>-0.0173**</td>
</tr>
<tr>
<td></td>
<td>(-3.20)</td>
</tr>
<tr>
<td>Mortgage</td>
<td>-0.0347***</td>
</tr>
<tr>
<td></td>
<td>(-6.31)</td>
</tr>
<tr>
<td>Leverage</td>
<td>0.114***</td>
</tr>
<tr>
<td></td>
<td>(20.28)</td>
</tr>
<tr>
<td>Size</td>
<td>-0.00590***</td>
</tr>
<tr>
<td></td>
<td>(-8.48)</td>
</tr>
<tr>
<td>Profitability</td>
<td>-0.226***</td>
</tr>
<tr>
<td></td>
<td>(-3.91)</td>
</tr>
<tr>
<td>qtr</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>4843</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.124</td>
</tr>
</tbody>
</table>

$t$ statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Table 17: Property Types: Detail

The table reflects individual property type probabilities of encumbrance. The dependent variable is binary, indicating whether or not a given asset is encumbered by a mortgage. Specialty property type is omitted. Equation is estimated using Probit and includes quarter time controls.

<table>
<thead>
<tr>
<th>MortgDummy</th>
<th>(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HealthCare</td>
<td>-0.152*** (-9.43)</td>
</tr>
<tr>
<td>Hotel</td>
<td>0.840*** (50.98)</td>
</tr>
<tr>
<td>Industrial</td>
<td>0.208*** (13.44)</td>
</tr>
<tr>
<td>Manufacturedhome</td>
<td>-0.791*** (-12.69)</td>
</tr>
<tr>
<td>Multifamily</td>
<td>0.466*** (32.65)</td>
</tr>
<tr>
<td>Multiuse</td>
<td>0.0812* (2.39)</td>
</tr>
<tr>
<td>Office</td>
<td>0.857*** (67.27)</td>
</tr>
<tr>
<td>RegionalMall</td>
<td>2.086*** (114.94)</td>
</tr>
<tr>
<td>RetailOther</td>
<td>0.0950*** (6.62)</td>
</tr>
<tr>
<td>SelfStorage</td>
<td>-0.910*** (-27.59)</td>
</tr>
<tr>
<td>ShoppingCenter</td>
<td>1.039*** (81.36)</td>
</tr>
</tbody>
</table>

N 476441
pseudo $R^2$ 0.151

$t$ statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Table 18: Interest Rate Summary Statistics

Individual Loan information is obtained from SP Capital IQ. Columns 3 through 5 reflect averages by Debt Type. There are 15,797 unique debt issuances observed over time. The sample reflects a time period from the beginning of the first quarter of 2000 to the end of the fourth quarter of 2012. The loan sample represents 187 REIT borrowers.

<table>
<thead>
<tr>
<th>Debt Type</th>
<th>n</th>
<th>Loan Amount</th>
<th>Interest Rate</th>
<th>Term (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank loans</td>
<td>1643</td>
<td>47,293,859</td>
<td>5.51</td>
<td>4.83</td>
</tr>
<tr>
<td>Bonds and notes</td>
<td>613</td>
<td>113,489,849</td>
<td>4.91</td>
<td>14.93</td>
</tr>
<tr>
<td>Capital leases</td>
<td>95</td>
<td>17,612,084</td>
<td>8.55</td>
<td>12.88</td>
</tr>
<tr>
<td>Debentures</td>
<td>195</td>
<td>236,059,529</td>
<td>5.53</td>
<td>12.18</td>
</tr>
<tr>
<td>Mortgage bonds</td>
<td>609</td>
<td>56,651,205</td>
<td>4.68</td>
<td>19.66</td>
</tr>
<tr>
<td>Mortgage loans</td>
<td>10,104</td>
<td>69,469,712</td>
<td>6.18</td>
<td>6.00</td>
</tr>
<tr>
<td>Mortgage notes</td>
<td>12,431</td>
<td>76,067,971</td>
<td>6.29</td>
<td>6.53</td>
</tr>
<tr>
<td>Notes payable</td>
<td>6,837</td>
<td>248,709,336</td>
<td>6.14</td>
<td>6.81</td>
</tr>
<tr>
<td>Other borrowings</td>
<td>262</td>
<td>200,228,258</td>
<td>6.56</td>
<td>8.18</td>
</tr>
<tr>
<td>Revolving credit</td>
<td>1,600</td>
<td>141,230,775</td>
<td>3.71</td>
<td>3.25</td>
</tr>
<tr>
<td>Term loan</td>
<td>1,105</td>
<td>192,925,911</td>
<td>5.17</td>
<td>5.12</td>
</tr>
<tr>
<td>Trust Preferred</td>
<td>147</td>
<td>49,662,544</td>
<td>5.86</td>
<td>25.91</td>
</tr>
</tbody>
</table>

Total 35,641 $114,358,235 5.99 6.7
Table 19: Interest Rates by Collateral and Market Access

Panel A: Interest Rates by Market Access

<table>
<thead>
<tr>
<th>Debt Type</th>
<th>No Market Access</th>
<th></th>
<th></th>
<th>Market Access</th>
<th></th>
<th>Means Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Interest Rate</td>
<td>n</td>
<td>Interest Rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bank loans</td>
<td>1386</td>
<td>5.31</td>
<td></td>
<td>257</td>
<td>6.54</td>
<td>-1.23 ***</td>
</tr>
<tr>
<td>Bonds and notes</td>
<td>255</td>
<td>4.25</td>
<td></td>
<td>358</td>
<td>5.38</td>
<td>-1.13 ***</td>
</tr>
<tr>
<td>Capital leases</td>
<td>43</td>
<td>8.79</td>
<td></td>
<td>52</td>
<td>8.36</td>
<td>0.42</td>
</tr>
<tr>
<td>Debentures</td>
<td>55</td>
<td>7.53</td>
<td></td>
<td>140</td>
<td>4.75</td>
<td>2.78 ***</td>
</tr>
<tr>
<td>Mortgage bonds</td>
<td>63</td>
<td>4.81</td>
<td></td>
<td>546</td>
<td>4.66</td>
<td>0.15</td>
</tr>
<tr>
<td>Mortgage loans</td>
<td>5878</td>
<td>5.95</td>
<td></td>
<td>4226</td>
<td>6.50</td>
<td>-0.55 ***</td>
</tr>
<tr>
<td>Mortgage notes</td>
<td>8354</td>
<td>6.21</td>
<td></td>
<td>4077</td>
<td>6.46</td>
<td>-0.25 ***</td>
</tr>
<tr>
<td>Notes payable</td>
<td>1372</td>
<td>6.11</td>
<td></td>
<td>5465</td>
<td>6.15</td>
<td>-0.04</td>
</tr>
<tr>
<td>Other borrowings</td>
<td>150</td>
<td>5.81</td>
<td></td>
<td>112</td>
<td>7.55</td>
<td>-1.75 ***</td>
</tr>
<tr>
<td>Revolving credit</td>
<td>973</td>
<td>3.83</td>
<td></td>
<td>627</td>
<td>3.52</td>
<td>0.32 ***</td>
</tr>
<tr>
<td>Term loan</td>
<td>712</td>
<td>5.18</td>
<td></td>
<td>393</td>
<td>5.17</td>
<td>0.01</td>
</tr>
<tr>
<td>Trust Preferred</td>
<td>80</td>
<td>5.97</td>
<td></td>
<td>67</td>
<td>5.74</td>
<td>0.24</td>
</tr>
<tr>
<td>Total</td>
<td>19,321</td>
<td>5.88</td>
<td></td>
<td>16,320</td>
<td>6.14</td>
<td>-0.26 ***</td>
</tr>
</tbody>
</table>

Panel B: Interest Rates by Collateral

<table>
<thead>
<tr>
<th>Debt Type</th>
<th>Secured Borrowings</th>
<th></th>
<th></th>
<th>Unsecured Borrowings</th>
<th></th>
<th>Means Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Interest rate</td>
<td>n</td>
<td>Interest rate</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Bank loans</td>
<td>1,506</td>
<td>5.68</td>
<td></td>
<td>107</td>
<td>2.95</td>
<td>2.73 ***</td>
</tr>
<tr>
<td>Bonds and notes</td>
<td>377</td>
<td>4.96</td>
<td></td>
<td>134</td>
<td>4.61</td>
<td>0.35</td>
</tr>
<tr>
<td>Capital leases</td>
<td>95</td>
<td>8.55</td>
<td></td>
<td>0</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Mortgage bonds</td>
<td>609</td>
<td>4.68</td>
<td></td>
<td>0</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Mortgage loans</td>
<td>10,088</td>
<td>6.17</td>
<td></td>
<td>0</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Mortgage notes</td>
<td>12,441</td>
<td>6.29</td>
<td></td>
<td>0</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Notes payable</td>
<td>1,510</td>
<td>6.32</td>
<td></td>
<td>5,052</td>
<td>6.09</td>
<td>0.22 ***</td>
</tr>
<tr>
<td>Other borrowings</td>
<td>103</td>
<td>6.01</td>
<td></td>
<td>46</td>
<td>6.49</td>
<td>-0.49</td>
</tr>
<tr>
<td>Revolving credit</td>
<td>632</td>
<td>4.37</td>
<td></td>
<td>882</td>
<td>3.15</td>
<td>1.22 ***</td>
</tr>
<tr>
<td>Term loan</td>
<td>780</td>
<td>4.99</td>
<td></td>
<td>200</td>
<td>4.57</td>
<td>0.41 **</td>
</tr>
<tr>
<td>Trust Preferred</td>
<td>0</td>
<td>n/a</td>
<td></td>
<td>147</td>
<td>5.86</td>
<td>n/a</td>
</tr>
<tr>
<td>Total</td>
<td>28,141</td>
<td>6.09</td>
<td></td>
<td>6,568</td>
<td>5.56</td>
<td>0.52 ***</td>
</tr>
</tbody>
</table>
Table 20: REIT Summary statistics

*Mortgage* is the ratio of Mortgage debt to Total Debt (as collected from quarterly reports and SNL), *Leverage* is the ratio of total debt reported to the market value of the company. The market value of the company is determined by subtracting the book value of equity from total assets and adding back the market value of equity. *FFOovTA* is a measure of profitability defined as Funds From Operations scaled by Total Assets. Debt Rating is a binary variable that indicates whether the company had a debt rating (Standard and Poors debt rating obtained from CRSP). The Age of the company is the number of quarters from the latter of going public or obtaining REIT status until the current period. Size is the natural log of Total Assets. Daily returns obtained from CRSP are used to estimate quarterly returns for each REIT.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Max.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>DebtRating</td>
<td>0.456</td>
<td>0.498</td>
<td>0</td>
<td>1</td>
<td>4853</td>
</tr>
<tr>
<td>return</td>
<td>0.005</td>
<td>0.312</td>
<td>-2.782</td>
<td>3.474</td>
<td>4815</td>
</tr>
<tr>
<td>MB</td>
<td>1.238</td>
<td>0.323</td>
<td>0.393</td>
<td>3.653</td>
<td>4853</td>
</tr>
<tr>
<td>Cash</td>
<td>0.024</td>
<td>0.053</td>
<td>0</td>
<td>0.997</td>
<td>4853</td>
</tr>
<tr>
<td>Size</td>
<td>14.46</td>
<td>1.353</td>
<td>8.948</td>
<td>18.11</td>
<td>4853</td>
</tr>
<tr>
<td>Age</td>
<td>39.956</td>
<td>30.254</td>
<td>0</td>
<td>170</td>
<td>4853</td>
</tr>
<tr>
<td>Leverage</td>
<td>0.441</td>
<td>0.161</td>
<td>0</td>
<td>0.921</td>
<td>4853</td>
</tr>
<tr>
<td>Mortgage</td>
<td>0.594</td>
<td>0.328</td>
<td>0</td>
<td>1</td>
<td>4853</td>
</tr>
<tr>
<td>FFOovTA</td>
<td>0.013</td>
<td>0.015</td>
<td>-0.476</td>
<td>0.085</td>
<td>4843</td>
</tr>
<tr>
<td>CreditLineUse</td>
<td>0.339</td>
<td>0.296</td>
<td>0</td>
<td>1</td>
<td>4853</td>
</tr>
</tbody>
</table>
Table 21: Determinants of Interest Rates

The dependent variable is Interest Rate, by loan. Secured01 is a binary variable, observed for each individual funding. DebtRating is a binary variable observed by REIT quarter that serves as a proxy of market access. Debt Rating is obtained from CRSP and reflects a Standard and Poors debt rating.

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>InterestRate</td>
<td>secured01 0.701***</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(27.70)</td>
</tr>
<tr>
<td></td>
<td>DebtRating 0.448***</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(22.42)</td>
</tr>
<tr>
<td></td>
<td>N 34836</td>
</tr>
<tr>
<td></td>
<td>t statistics in parentheses</td>
</tr>
<tr>
<td></td>
<td>* p &lt; 0.05, ** p &lt; 0.01, *** p &lt; 0.001</td>
</tr>
</tbody>
</table>
Table 22: Determinants of Interest Rates: Loan Characteristics with Controls

Column two shows loan characteristics with macro controls. Column three includes standard errors clustered by firm. Secured01 is a binary variable, observed for each individual funding. DebtRating is a binary variable observed by REIT quarter that serves as a proxy of market access. UBAA is the mean Moody's corporate bond spread of BAA for the quarter, u30Mortg is the mean 30 years mortgage rates for the quarter, both obtained from the Federal Reserve of St. Louis.

<table>
<thead>
<tr>
<th></th>
<th>(1) InterestRate</th>
<th>(2) InterestRate</th>
<th>(3) InterestRate</th>
</tr>
</thead>
<tbody>
<tr>
<td>secured01</td>
<td>0.483***</td>
<td>0.484***</td>
<td>0.484***</td>
</tr>
<tr>
<td></td>
<td>(18.49)</td>
<td>(18.58)</td>
<td>(3.78)</td>
</tr>
<tr>
<td>DebtRating</td>
<td>0.543***</td>
<td>0.546***</td>
<td>0.546***</td>
</tr>
<tr>
<td></td>
<td>(27.82)</td>
<td>(27.97)</td>
<td>(3.77)</td>
</tr>
<tr>
<td>LnLoanAmount</td>
<td>-0.157***</td>
<td>-0.156***</td>
<td>-0.156***</td>
</tr>
<tr>
<td></td>
<td>(-25.80)</td>
<td>(-25.61)</td>
<td>(-4.52)</td>
</tr>
<tr>
<td>loanterm</td>
<td>0.0000208***</td>
<td>0.0000202***</td>
<td>0.0000202***</td>
</tr>
<tr>
<td></td>
<td>(5.32)</td>
<td>(5.17)</td>
<td>(0.68)</td>
</tr>
<tr>
<td>uBAA</td>
<td>-0.122***</td>
<td>-0.122***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-9.26)</td>
<td>(-4.72)</td>
<td></td>
</tr>
<tr>
<td>u30Mortg</td>
<td>0.194***</td>
<td>0.194***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(8.88)</td>
<td>(3.68)</td>
<td></td>
</tr>
<tr>
<td>qtr</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>33606</td>
<td>33606</td>
<td>33606</td>
</tr>
</tbody>
</table>

* t statistics in parentheses
* * p < 0.05, ** * p < 0.01, *** * p < 0.001
Table 23: Determinants of Interest Rates: Company Characteristics

<table>
<thead>
<tr>
<th></th>
<th>InterestRate</th>
<th>InterestRate</th>
<th>InterestRate</th>
<th>InterestRate</th>
<th>InterestRate</th>
<th>InterestRate</th>
<th>InterestRate</th>
</tr>
</thead>
<tbody>
<tr>
<td>secured01</td>
<td>0.379***</td>
<td>0.295***</td>
<td>0.301***</td>
<td>0.298***</td>
<td>0.502***</td>
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* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
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Table 25: Determinants of Return
Debt Rating is a binary variable by REIT quarter. Daily returns obtained from CRSP are used to estimate quarterly returns for each REIT. Quarterly return is the dependent variable.

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*t statistics in parentheses
* p < 0.05, ** p < 0.01, *** p < 0.001
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* t statistics in parentheses
* * p < 0.05, ** p < 0.01, *** p < 0.001
Table 27: Stage 1: Predict Market Access
The dependent variable is Debt Rating, a binary variable that indicates whether the company had a debt rating (obtained from CRSP). Mortgage is the ratio of Mortgage debt to Total Debt (as collected from quarterly reports and SNL), FFOovTA is a measure of profitability defined as Funds From Operations scaled by Total Assets. The Age of the company is the latter of a company going public or obtaining REIT status. UBAA is the mean Moodys corporate bond spread of BAA for the quarter.

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$t$ statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Table 28: Stage 2: Return Determinants using Predicted Market Access

The dependent variable is Return. MarketAccess is the predicted value estimated in Table 10. \( \text{FFOovTA} \) is a measure of profitability defined as Funds From Operations scaled by Total Assets. \( \text{UBAA} \) is the mean Moody's corporate bond spread of BAA for the quarter, \( \text{u30Mortg} \) is the mean 30 years mortgage rates for the quarter, both obtained from the Federal Reserve of St. Louis.

<table>
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* t statistics in parentheses
+ p < 0.10, * p < 0.05
Table 29: Recession Robustness

The dependent variable is Return. MarketAccess is the predicted value estimated in Table 10. Leverage is the ratio of total debt reported to the market value of the company. The market value of the company is determined by subtracting the book value of equity from total assets and adding back the market value of equity. FFOovTA is a measure of profitability defined as Funds From Operations scaled by Total Assets. UBAA is the mean Moody’s corporate bond spread of BAA for the quarter, u30Mortg is the mean 30 years mortgage rates for the quarter, both obtained from the Federal Reserve of St. Louis. FedSurvey is the The Loan Officer Survey of commercial real estate lending obtained from St. Louis Federal Reserve.

<table>
<thead>
<tr>
<th></th>
<th>(1) Recession</th>
<th>(2) No Recession</th>
</tr>
</thead>
<tbody>
<tr>
<td>MarketAccess</td>
<td>0.0484(^{+})</td>
<td>0.0419(^{*})</td>
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<tr>
<td></td>
<td>(1.68)</td>
<td>(2.74)</td>
</tr>
<tr>
<td>Leverage</td>
<td>-0.322(^{*})</td>
<td>0.0693(^{*})</td>
</tr>
<tr>
<td></td>
<td>(-5.08)</td>
<td>(2.03)</td>
</tr>
<tr>
<td>FFOovTA</td>
<td>0.664</td>
<td>1.556(^{*})</td>
</tr>
<tr>
<td></td>
<td>(1.02)</td>
<td>(4.65)</td>
</tr>
<tr>
<td>UBAA</td>
<td>-0.261(^{*})</td>
<td>-0.0272</td>
</tr>
<tr>
<td></td>
<td>(-8.65)</td>
<td>(-1.29)</td>
</tr>
<tr>
<td>u30Mortg</td>
<td>0.222(^{*})</td>
<td>-0.0586(^{*})</td>
</tr>
<tr>
<td></td>
<td>(5.02)</td>
<td>(-3.25)</td>
</tr>
<tr>
<td>FedSurvey</td>
<td>0.00388(^{*})</td>
<td>0.00347(^{*})</td>
</tr>
<tr>
<td></td>
<td>(3.65)</td>
<td>(7.85)</td>
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<tr>
<td>uProp</td>
<td>-0.00945(^{*})</td>
<td>0.00164(^{*})</td>
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<tr>
<td></td>
<td>(-5.72)</td>
<td>(3.50)</td>
</tr>
<tr>
<td>Age</td>
<td>-0.000314</td>
<td>0.00000225</td>
</tr>
<tr>
<td></td>
<td>(-0.97)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>qtr</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>(N)</td>
<td>802</td>
<td>3743</td>
</tr>
</tbody>
</table>

\(t\) statistics in parentheses
\(^{+}\) \(p < 0.10\), \(^{*}\) \(p < 0.05\)
Figure 2: REIT Leverage Histogram
The histogram below represents the frequency of various leverage occurrences expressed as percentage of total 6,188 observations.

Figure 3: REIT Mortgage Use
The histogram below showcases the frequency of mortgage use, or the popularity of it as a debt instrument among REITs.
Figure 4: Sample REIT Asset Distribution
The figure below outlines the property portfolio of HCP, a healthcare REIT located in Irvine, CA.

Figure 5: Cap Rates by Property Type
The figure below outlines historical cap rates by property type.
References


