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Is What's Bad for the Goose (Tenant), Bad for the Gander (Landlord): A Retail Real Estate Perspective

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Abstract

Given the current financial crisis, we explore the impact that tenant bankruptcies have on the risk and return performance of their publicly traded landlord. We focus on retail REITs since the contracting mechanism associated with retail leases has several options such as percentage rents and co-tenancy provisions that are not found in leases for other property types. Ex-ante, we argue that the performance of a landlord will depend on which option dominates given that a departure of an anchor or key tenant from a center affords the landlord with a growth option, the opportunity to adjust rents to market. Utilizing an event study approach, we find significant abnormal negative returns follow the bankruptcy of a tenant in general which is consistent with the market perceiving that tenants will take advantage of the co-tenancy option. However, we also find that there are some situations where the growth option is in the money and thus abnormal returns are positive particularly in markets that have a more diversified economic base.

JEL Classification: G11, G12, G14, G33, R33,

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1. Introduction

We analyze the linkage between tenant quality and the performance of commercial real estate using a sample of retail real estate investment trusts. We focus on retail REITs since the contracting mechanism associated with retail leases has several options such as percentage rents and co-tenancy provisions that are not found in leases for other property types. While the prior literature has focused on the former option whose use better aligns the incentives between the landlord and tenant, little if any research exists on the latter option which tends to mitigate this alignment in favor of the tenant(s). The co-tenancy clause, relatively common in retail leases, allows tenants to demand reductions in rent or a penalty-free pullout if key tenants or a specified numbers of stores (occupancy threshold) leave the retail center. The rationale for this inducement clause is that the tenants rely on certain anchors or other national or regional tenants to draw customers to the center as well as a certain mix of tenants having similar customer demographics to increase sales. Consequently, while the co-tenancy clause complements the percentage rent clause in a good market, it can have a domino effect in turbulent economic times. An alternative way of thinking about this problem from a cash flow perspective is that while the percentage rent provides a floor for cash flows in a bad market, the co-tenancy provision lowers the floor.

Given the current financial crisis, we explore the extent to which the co-tenancy provision exerts a greater influence on cash flows to the landlord relative to the percentage rent clause. Ex-ante, it is unclear which option dominates if an anchor or key tenant departs from a center since this also affords the landlord with a growth option, the opportunity to adjust rents to market. If the landlord is able to lease the space to an equivalent anchor or one of higher quality, then the landlord should experience a positive stock market reaction. By higher quality, we mean that the key tenant generates more traffic and hence higher drawing power for the retail center and has an equivalent or

higher tenant credit rating. On the other hand, the common stock of a landlord should decline if the market perceives that the landlord is unable to re-lease the space and existing tenants thus take advantage of the co-tenancy option. To examine the abnormal returns of common stocks of REITs, we utilized the prior and post press release date data of public companies experiencing major tenant bankruptcies. In addition to those retailers under bankruptcy filings, there have been numerous store closings announced by retailers due to their strategic repositioning or unfavorable economic conditions. Regardless of the reasons of store closures, the impact to the landlords is much more severe than we have estimated. Because bankrupt stores will be closed without an attempt of restructuring under bankruptcy protection, we narrow down our focus to these cases since landlords do not receive any lease termination payments.

We use an event study approach to investigate the impact of a major tenant's Chapter 11 bankruptcy filing on the landlord by observing the movements of the landlord's stock. We find significant abnormal negative returns following the bankruptcy of a tenant in general which is consistent with the market perceiving that tenants will take advantage of the co-tenancy option although there are some situations where the growth option prevails. The results are robust across various model specifications. Cross-sectional analyses reveal that the location quality of landlord markets play an important role in determining whether the growth option exists. A landlord is defined to have a higher location quality, if its properties (malls or shopping centers) are located in markets that have more diversified economic base. A multivariate OLS regression shows that the abnormal returns are positively associated with location quality, conditional on the level of tenant exposure. The results are significant even after we control for firm level characteristics.

2. Hypothesis

We study the impact of major tenant events on the stock performance of their landlord. In contrast to most real estate leases, which contract a fixed rental payment between landlord and tenant, retail tenants pay a percentage of their gross sales as rent in addition to the base rent. Past research has widely recognized that stores in shopping centers generate business traffic or sales externality among retail tenants, as costumers do "complimentary" or "comparison" shopping (Eaton and Lipsey, 1979 and Wolinsky, 1983). On one hand, a percentage rent provides a risk sharing mechanism for business uncertainty (Liceli and Sirmans, 1995) and better aligns the incentives between tenant and landlord (Brueckner, 1993 and Lee, 1995). On the other hand, the percentage lease contract creates business inter-dependence: a key tenant bankruptcy or store closures may significantly impact the performance of a landlord. The major tenant event may lead to the following effects.

2.1 Direct effect from tenant revenue losses:

Retail landlords suffer when a tenant files for bankruptcy, first losing rental revenue on the space the retailer occupies, then being forced to find replacement tenants. Such a threat to a landlord's revenue can have an immediate impact on stock price of the landlord as evidenced in the following news examples:

Developers Diversified Realty Corp., Kimco Realty Corp., General Growth Properties Inc. were among retail landlords that fell in New York trading after Circuit City Stores Inc. filed for Chapter 11 bankruptcy protection. Developers Diversified, based in Beachwood, Ohio, fell $2.37, or 25 percent, to $7.25 in New York Stock Exchange composite trading. New Hyde Park, New York-based Kimco Realty Corp., the largest U.S. owner of community shopping centers, fell $2.01, or 9.6 percent, to $19. Chicago-based General Growth fell 70 cents, or 34 percent, to $1.37. ---Bloomberg 11/10/2008

Malan Realty Investors, Inc. (NYSE: MAL), a self-administered REIT, provided information today on its exposure to Kmart Corporation(NYSE: KM) and the potential impact of Kmart's bankruptcy filing on the Company's operating results for 2002. Malan has 27 properties

leased to Kmart and derives approximately 25 percent of its annualized base rents from Kmart. --- Malan Realty Investors, Inc. Press Release Jan. 22, 2002.

Malan Realty Investors, Inc., …, said its board voted to sell the company's 58 shopping center assets and liquidate the company. Malan, …,leases more space to the bankrupt retailer Kmart than all but two other real estate investment trusts. The company's shares have fallen 43 percent over the last 12 months. ---the New York Times 3/21/2002

Depending on the exposure to the troubled tenants, the magnitude of the landlord's stock market response may vary. A landlord with larger tenant exposure, i.e., higher percentage of revenue generated from the bankrupted tenant, will have a stronger response. A landlord with more diversified tenants will tend to be more resilient to shocks from any particular tenant.

2.2 Re-tenanting and the growth option

With a well-diversified tenant base, a landlord has only limited revenue exposure to the anchor tenant. Furthermore, a given regional mall may have more than 200 tenants but the most notable – the anchors – typically pay little, if any rent. Such anchors and other tenants with "brand" drawing power not only pay less base rent, but also tend to pay a lower percentage of their sales (Wheaton, 2000).

Furthermore, store closures may benefit the landlord. Despite numerous big box store closings and chain liquidations, stronger retailers have been re-leasing several of the vacated locations as second-generation space. Retail landlord may take this opportunity to replace the below-market rents contracted several years ago with new tenants who are in the expansion mode.

For example, prior to 2009, Indianapolis-based HHGregg was a regional electronics chain that few shoppers had heard of outside of the Midwest. The chain saw the opportunity presented by the glut of big box space and took advantage of it to grow into a national player. Colliers International 2010 reports that HHGregg has opened more than 30 stores within the past 18 months--and plans to open 45 more in 2011. The majority of these new locations formerly housed

failed electronics giant Circuit City. Other tenants actively signing leases recently include Kohl's, Dollar Tree, Buybuy Baby, Express, and Giant, etc.

Moreover, the termination of old leases not only grant the landlord an opportunity of marking the rents to market, but also provides some flexibility of keeping the growth option alive, as evidenced below.

At neighborhood and community center REITs, strong leasing velocity at its centers resulted in a 30bps increase in occupancy to 94.5% over second quarter.

Tanger was among those who lead the industry, producing an average increase on executed renewal of 18.3% compared to 13.6.% last year. The figure on new leases/re-tenanting is even stronger – a 43% increase in base rent over what the previous tenant was paying.

Store closures at Tanger's outlet centers seems to benefit the REIT, if it can keep up its pace of leasing. PREIT has provided some relief to retailers over the last quarter, granting underperforming retailers several short-term renewals at their current terms with the goal of maintaining occupancy in the near term while providing us the flexibility to re-lease these spaces in a more favorable economic environment.

----CoStar Report 11/12/2008

However, the retailers are selectively targeting the best available locations. This suggests that stores in the expansion mode will locate in areas with growing local economies to achieve sales growth. There continues to be demand for space in better quality locations, with more modest pressure on rents. Retail chains are capitalizing on the opportunity to upgrade by increasing their store size in the top malls.

2.3 The contagion effect

For most retail landlords, any particular tenant may only account for a small portion of total revenue that a landlord receives from other performing tenants. However, store closures and tenant liquidations still impact the landlord in a meaningful way due to the contagion effect, which refers to the adverse consequences of one firm's action spreading throughout the industry. Extensive evidence exists of the intra-industry contagion effect of Chapter 11 bankruptcies in the stock market (Lang and Stulz, 1992, and Jorion and Zhang, 2007). For example, in 2002, the telecommunication

sector accounted for 56% of all corporate bankruptcies in terms of dollar debt defaulted. During the 2007-2009 crisis, similar contagious bankruptcies occured in the financial industry. The explanations for the contagion effect include but are not limited to the following:

1) Financial distress across companies is driven by common economic factors within the industry (Das, Duffie, Kapadia, and Saita, 2007).

2) The default of one firm causes financial distress on other firms with which the first firm has close business ties (Davis and Lo, 2001; Jarrow and Yu, 2001).

3) Updating of beliefs, which arises when investors learn from other defaults. For example, the failure of Enron led investors to reassess their views of the quality of accounting information from other firms. (Collin-Dufresne, Goldstein, and Helwege, 2003 and Giesecke, 2004).

Generally, a "contagion effect" implies positive default correlations. A more relevant example in the retail industry is video rental stores. Immediately following reports that bankrupt retailer Movie Gallery (which also owns Hollywood Video) planned to liquidate its remaining 2000 plus stores in early May 2010, shopping center landlords had the entire video rental segment on their watchlists. Later the same year, Blockbuster (another video rental store) filed for Chapter 11 bankruptcy on September 23, 2010.

2.4 Co-tenancy Amplification effect

Even though the direct revenue loss from the bankrupt tenant is limited for a well-diversified landlord, the failure of a key tenant may have an amplifying or domino effect due to the co-tenancy clause contained in many retail leases. The co-tenancy has long been a part of modern shopping center development and retail leasing strategies. The clause takes many forms, with some requiring a certain percentage of a shopping center to be leased and others naming specific retailers or categories that must remain open. The rationale supporting a tenant request is fairly simple: The tenant is relying on certain anchor tenants to be a draw for customers to visit the shopping center

and is expecting a certain tenant mix. The requesting tenant is counting on that business traffic to increase its visibility and sales.

The risk created by the domino effect of lease terminations or reduced rent that might arise from a co-tenancy failure can be catastrophic. This ripple effect is especially a concern in turbulent times when it is hard to re-lease the space to other tenants. The bankruptcy of an anchor tenant may thus trigger a chain reaction of lease terminations of small retailers and thus lead to a collectively larger revenue loss to the landlord.

3. The Data and Descriptive Analysis

We obtain our data from several sources.

3.1 REIT firm and tenant data:

We choose to study retail real estate investment trusts (REITs) since the retail REIT sector accounts for the majority of the retail real estate industry. Moreover, the financial information as well as tenant information is transparent. Table 1 lists all retail REITs used in this study including defunct firms. There are 73 firms in total, among which 32 are current REITs and 41 are historical REITs. We manually match the relation between landlord REITs and their tenants. REIT stock returns and REIT index returns between 2000 and 2010 are obtained from CRSP/Ziman database with corresponding REIT accounting data taken from Compustat and SNL. We obtain a list of top tenants of each REIT from SNL. The tenant information include the contractual relations between landlord REIT firms and their tenants, number of leases, percentage of revenue and percentage of square feet from each tenant.

3.2 Public company bankruptcy filings:

The Bankruptcy Research Database is obtained from http://lopucki.law.ucla.edu/index.htm. The database includes all Chapter 11 bankruptcy cases filed by or against a debtor group that: 1) Has

assets worth $100 million or more at the time of filing, measured in 1980 dollars, and 2) Is required to file 10-Ks with the SEC.

There were 907 major public firms filing for chapter 11 between 1980 to 2010. Figure 1 shows time variation of bankruptcy filings by industry. We select chapter 11 bankruptcy cases according the following rules: 1) Bankruptcy filed after 1999, as REIT tenant exposure information is not available prior to 2000, and 2) Lease real estate space from at least one REIT landlord before filing Chapter 11. Figure 2 demonstrates total number of bankruptcy filings across industry and across years in the sample.

3.3 Private firm bankruptcy

We manually collect historical private retailer bankruptcy from various industry reports: J.P. Morgan, Morgan Stanley, Deutsche Bank, Colliers International, Costar, International Shopping Center Council, ULI, etc. The total numbers of defunct retailers vary by industry sectors (Figure 3) and the defunct department stores vary by states (Figure 4). From the 681 defunct retailers in the United States who have closed their doors since 1950, we match the private retailers that liquidated after 1999. We match the top tenants reported in SNL to identify bankrupt private retailers who were the top tenants of at least one publicly traded REIT. Table 2 contains 11 private retailers that went bankrupt after 1999, whose bankruptcies affected 20 REIT landlords.

4. Empirical Methodology

Our primary emphasis is on the announcement day effect, although we report measures of abnormal performance for various sub-periods between day -90 and day +30. The impact of a major tenant bankruptcy announcement on the REIT's stock price is estimated using abnormal performance over the event window. We define the following timing sequence: event date, t=0, as the date of the tenant bankruptcy filing, event window as T_1+1 to T_2, and the pre-bankruptcy

estimation window as T_{0+1} to T_1. The timing sequence is illustrated on the time line in Figure 5. We interpret the abnormal returns and volatilities over the event window as measures of the impact of a tenant bankruptcy event on the value of the REIT.

4.1 The measurement of abnormal performance

We present two types of evidence on abnormal returns following a tenant bankruptcy event. First, we calculate the cumulative abnormal returns (CARs) after bankruptcy using different time horizons (Campbell, Lo and MacKinlay, 1997). Second, we present results using the buy-and-hold returns (BHARs), as it is a better method to calculate long-run abnormal return reflecting the compounding in long-run returns (Barber and Lyon, 1997).

CAR estimation:

There are several return-generating processes used in the literature for calculating the return on a given security. The most commonly used approaches in the finance literature are 1) the constant mean return model, which calculates the abnormal return as the difference between realized return on security i in period t and its mean return for the same security over the normal performance period, (Brown and Warner, 1980, 1985); and 2) The market model, which we describe in detail below. We present results for both the constant return model and the CAR model.

We define the prediction error from the market model as the abnormal return. The daily prediction error PE_{it} for each firm i on each event day t during the period of interest is estimated as

$$PE_{it} = R_{it} - \left(\hat{\alpha}_i + \hat{\beta}_i R_{mi} \right),$$

where

$R_{it} \equiv$ the continuously compounded stock return of REIT i on day t;

$R_{mt} \equiv$ the continuously compounded market return of CRSP/Ziman REIT index on day t;

$\hat{\alpha}_i$, $\hat{\beta}_i \equiv$ OLS estimation coefficients of market model regression. Parameters are estimated over 60 day period (-90 to -30) in the pre-bankruptcy event window.

The prediction errors PE_{it} are averaged across the N_t firms in subsample on each event day t to form the abnormal return PE_t

$$PE_t = \frac{1}{N_t} \sum_{i=1}^{N_t} PE_{it}.$$

The average abnormal returns are cumulated from day -90 to +30 to form the CAR. The average prediction errors are also cumulated over various sub-periods to form the average abnormal returns for a given window. The statistic testing whether or not abnormal performance is significantly different from zero for a window of interest is based on the time series variance of the average prediction errors for 30 days from day 0 to day +30.

In summary, the CAR estimate for a period of length τ is the sum of the average abnormal returns for the sample securities as in the following form:

$$CAR_{i\tau} = \sum_{t=1}^{\tau} \left[R_{it} - E\left(R_{it}\right) \right]$$

Depending on how the normal performance is measured, $E(R_{it})$ takes different forms. The constant return model uses the constant mean return for the specific security of interest while the market model uses the projected value from a market model regression.

BHAR Estimation

The cumulative abnormal return from the buy-and-hold strategy (BHAR) is calculated as the return on a buy-and-hold investment in the firm less the return on a buy-and-hold investment in a portfolio with an appropriate expected return:

$$BHAR_{i\tau} = \prod_{t=1}^{\tau} \left[1 + R_{it}\right] - \prod_{t=1}^{\tau} \left[1 + E\left(R_{it}\right)\right].$$

We use the value weighted REIT index return R_{mt} as appropriate expected return instead of the NYSE/AMEX/NASDAQ market index return. The returns on three CRSP/Ziman indices - all REITs, equity REITs, and retail REITs - are used as benchmark returns in our BHAR estimation.

Recent methodological studies disagree on the best method to calculate abnormal returns, (see for example, Barber and Lyon, 1997, and Fama 1998). However, it seems that both CARs and BHARs have their strengths and can be considered as complementary rather than competing approaches in computing abnormal returns (Dichev and Piotrosky, 2001). The difference between the CARs and BHARs results from the effect of compounding. CARs ignore compounding, while BHARs do not. If individual security returns are more volatile than the returns on the market index, CARs will be greater than BHARs. Ritter (1991) was among the first to argue that the CARs and BHARs can be used to answer different questions.

4.2 Statistical tests of abnormal return

To test the null hypothesis that the mean cumulative or buy-and-hold abnormal returns equal zero for a sample of N firms, we employ the following parametric test statistics:

$$t_{CAR} = \frac{\overline{CAR_i}(\tau_1, \tau_2)}{\sqrt{Var\left[\overline{CAR_i}(\tau_1, \tau_2)\right]}}$$

$$\text{where } \overline{CAR_i}(\tau_1, \tau_2) = \tfrac{1}{N}\sum_{i=1}^{N} CAR_i(\tau_1, \tau_2)$$

$$Var\left[\overline{CAR_i}(\tau_1, \tau_2)\right] = \tfrac{1}{N^2}\sum_{i=1}^{N} \sigma_i^2(\tau_1, \tau_2)$$

$$\text{and } \sigma_i^2(\tau_1, \tau_2) = (\tau_2 - \tau_1 + 1)\sigma_{\varepsilon_i}^2$$

And

$$t_{BHAR} = \frac{\overline{BHAR_i}(\tau_1, \tau_2)}{\sqrt{Var\left[\overline{BHAR_i}(\tau_1, \tau_2)\right]}}$$

$$\text{where } \overline{BHAR_i}(\tau_1,\tau_2) = \tfrac{1}{N}\sum_{i=1}^{N} BHAR_i(\tau_1,\tau_2)$$
$$Var\left[\overline{BHAR_i}(\tau_1,\tau_2)\right] = \tfrac{1}{N^2}\sum_{i=1}^{N}\sigma_i^2(\tau_1,\tau_2)$$

Where $\overline{CAR_i}(\tau_1,\tau_2)$ and $\overline{BHAR_i}(\tau_1,\tau_2)$ are the sample averages and $Var\left[\overline{CAR_i}(\tau_1,\tau_2)\right]$ and $Var\left[\overline{BHAR_i}(\tau_1,\tau_2)\right]$ are the cross-sectional sample standard deviations of abnormal returns for the sample of N firms over the window between τ_1 to τ_2. If the sample is drawn randomly from a normal distribution, the two test statistics follow a Student t distribution under the null hypothesis.

4.3 Cross-sectional analysis of abnormal performance

In the results that follow, we employ multivariate regressions to explain the cross-sectional variation in the abnormal return in the post-bankruptcy periods. We are interested in what factors determine the cross-sectional variation of cumulative abnormal returns. Liu, Liu and Zhang (2010) provide the theory and evidence linking REIT value to its asset quality. They find that an asset's tenant quality and location quality determine the firm value of a REIT. We predict that the size of a landlord's exposure to distressed tenants will have a negative effect. The larger the percentage revenue of the REIT from the bankrupt tenant, the bigger the impact.

Another significant determinant of REIT value is location quality. In our analysis, we measure the location quality using the average industry diversification ratio of a REIT's top markets. Each local market is defined as a Metropolitan Statistical Area (MSA). The United States Office of Management and Budget (OMB) defines an MSA as one or more adjacent counties or county equivalents that have at least one urban core area of at least 50,000 population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties. The OMB has defined 366 MSAs in the U.S. For example, the New York metropolitan area (the New York-Northern New Jersey-Long Island MSA), which is the largest MSA in the U.S., includes ten counties in New York State, twelve counties in Northern and Central

New Jersey, and one county in northeastern Pennsylvania. The idea is that REITs that operate in a market with a more diversified mix of industries may be in a better position to re-lease their space.

To construct such a proxy, we first obtain the top ten markets for each REIT. Following Gibbs and Martin, (1962), for each MSA we calculate a Gibbs-Martin diversification index (GMI)[1]:

$$GMI = 1 - \frac{\sum_{i=1}^{N} E_i^2}{(\sum E_i)^2},$$

Where E_i is the number of employees in each industry category of a particular MSA. Doing so makes it possible for us to measure the extent of local real estate market diversification and industry concentration. If the labor force is concentrated in a single industry, then the index is zero.

Our hypothesis is that malls and shopping centers situated in better locations are less likely to be affected by the liquidation of their key tenants since an increased likelihood exists that the re-tenanting growth option is in the money. Retail REITs whose properties are located in markets with a high GMI index (high location quality) will have a smaller negative effect (or even positive effect) to their stock performance following a tenant bankruptcy event.

In summary, we run the following multivariate OLS regression:

$$AR_{it} = a + b_1(Location) + b_2(Tenant) + b_3(Controls) + \varepsilon_t \ ,$$

where

AR_{it} ≡ Cumulative abnormal return (CARs, and BHARs) for firm i over the window period;

Location ≡ the location quality of a REIT, which is measure as average GMI of top MSAs;

Tenant ≡ tenant exposure, measured as the percentage of revenue from the bankrupt tenant. The percentage of leased square feet is used, if the percentage of revenue is not available.

Controls ≡ firm level control variables include size (measured as logarithm of book asset) and leverage ratio (measured as total debt over total capitalization).

[1] Corgel and Gay (1987) study the Gibbs and Martin diversification index (GMI) to study the mortgage default probability across MSAs. The GMI equals one minus the Herfindahl-Hirschman Index (HHI).

We separately estimate CARs and BHARs for various post-event windows of interest including day 0 to day +1, 0 to day +2, 0 to day +5 and 0 to day +30. We expect the regression coefficients b_1 and b_2 to be positive and negative respectively.

5. Empirical Results

Table 3 presents the average percentage of abnormal returns (ARs) and cumulative abnormal returns (CARs) (starting from -30 trading day before the event) for various trading day windows. The constant return model applies the mean of historical returns as the normal performance for the security of interest. The market model uses fitted values from a market model regression as normal performance. Table 4 presents the percentage of cumulative buy-and-hold abnormal returns (starting from -30 trading day before the event) for various trading day windows. The cumulative abnormal return from buy-and-hold strategy (BHAR) is calculated by the return on a buy-and-hold investment in the sample firm less the return on a buy-and-hold investment in a portfolio with an appropriate CRSP/Ziman index.

Figure 6 displays a visual representation of the cumulative abnormal returns. Even though CARs and BHARs are both negative and decreasing before the bankruptcy event window.Consistent with past event studies, the two-day event window contains the most significant cumulative abnormal return.

Key statistics of the cumulative abnormal returns (CARs) and buy-and-hold abnormal returns (BHARs) are shown in Table 5 for various post-event windows following a tenant bankruptcy, with the event date as the date of the bankruptcy filing. We define a 2 day return and a 5 day return as 0 to +1, and 0 to +4, respectively. We use both the market model and the constant return model to estimate CARs while we use three REIT indices (All REIT, Equity REIT, and Retail REIT) from Ziman to estimate BHARs. The null hypotheses of no abnormal return at the post-event window

are strongly rejected across all model specifications. In contrast to previous event studies, which use pre-event variance estimation to form a t-test statistic, we utilize the post-event variance estimation to calculate t-statistics. As bankruptcy events create more uncertainty, one should expect the post-event volatility to be greater than that of a pre-event window (we verify this subsequently). Therefore, our t-statistics avoid the problem of over-rejecting the null hypothesis.

Table 6 reports a risk measure of REITs' abnormal returns before and after a bankruptcy event for a major tenant(s). The risk dynamics is measured as the annualized volatility (or standard deviation) of BHAR for various event windows. Consistent across benchmark return measures, the volatility of abnormal returns in the post-bankruptcy window is much higher relative to the pre-bankruptcy window. For example, the volatility for the -90 to -60 (pre-bankruptcy) window is 0.065 with the volatility increasing to 0.070 for the 0 to +30 (post-bankruptcy) window.

To investigate the cross-sectional differences in the abnormal returns in the post-event window, we run a multivariate OLS regression. Table 7 reports the regression results for CAR including both the market model and the constant return model (Panel A) and for BHAR (Panel B) across 1-day, 2-day and 5-day post-event window. Robust across several specifications, the location quality is highly significant with the right sign (positive). The coefficient on tenant exposure is negative, which means that a higher percentage of revenue from a bankrupted tenant will have a greater impact on the landlord, with negative consequences to the landlord's stock price.

We further investigate whether the abnormal responses of the landlord's stock price to tenant bankruptcy are different for a public tenant compared to a private tenant. In an unreported regression result, where we include a dummy variable indicating public tenant bankruptcy to the regression with location quality and tenant exposure as repressors, we find that the public dummy variable is insignificant. Table 8 reports the results of 2-day post-bankruptcy abnormal returns for three separate regressions consisting of all tenants, public tenants, and private tenants respectively.

There is little (if any) difference between the public tenant sample and private tenant sample, conditional on the percentage exposure of the bankrupted tenant.

To check the robustness of our regression results on landlord cross-sectional abnormal returns following a tenant bankruptcy, we included a few firm-level control variables. The first control variable is firm size measured as the logarithm of the landlord firm's total assets. The second control variable is leverage ratio computed as the ratio of total debt to total capitalization. Table 9 provides a sample summary statistics and Pearson correlation matrix for the control variables. . We next add two firm level controls to the independent variables, location quality and tenant exposure. Table 10 shows that the location quality and the tenant exposure remain significant and unchanged in sign, even after controlling for firm characteristics. The results also show that larger landlords or highly leveraged firms experience greater negative effects to tenant bankruptcies.

6. Summary and Conclusions

Given the current financial crisis, we explore the impact that tenant bankruptcies have on the risk and return performance of their publicly traded landlord. We focus on retail REITs since the contracting mechanism associated with retail leases has several options such as percentage rents and co-tenancy provisions that are not found in leases for other property types. Ex-ante, we argue that the performance of a landlord will depend on which option dominates given that a departure of an anchor or key tenant from a center affords the landlord with a growth option, the opportunity to adjust rents to market. If the landlord is able to lease the space to an equivalent anchor or one of higher quality, then the landlord should experience a positive stock market reaction.

To examine the abnormal returns of common stocks of landlord REITs, we utilize an event study approach with the focus on the prior and post press release date of companies experiencing major tenant bankruptcies. Although we find significant abnormal negative returns follow the

bankruptcy of a tenant in general which is consistent with the market perceiving that tenants will take advantage of the co-tenancy option, there are some situations where the growth option prevails. More specifically, we find that the location quality of landlord markets e.g., properties (malls or shopping centers) are located in markets that have more diversified economic base play an important role in determining whether the growth option exists. Abnormal returns are positively associated with location quality, conditional on the percentage of tenant exposure. The results are significant even after we control for firm level characteristics.

References

Agarwal, S., Ambrose, B., Huang, H., and Yildirim, Y., 2009. "The Term Structure of Lease Rates with Endogenous Default Triggers and Tenant Capital Structure: Theory and Evidence." Forthcoming, *Journal of Financial and Quantitative Analysis*.

Agrawal, A. and Cockburn, I., 2002. "University Research, Industrial R&D, and the Anchor Tenant Hypothesis." National Bureau of Economic Research Working Paper 9212.

Barber, Brad M., and John D. Lyon, 1997, Detecting long-run abnormal stock returns: The empirical power and specification of test statistics, *Journal of Financial Economics* 43, 341–372.

Bean, J., Noon, C., Ryan S, and Salton, G. , 1988. "Selecting Tenants in a Shopping Mall." *Interfaces,* 18(2), 1-9.

Benjamin, J., Boyle, G. and Sirmans, C.F., 1990. Retail Leasing: The Determination of Shopping Center Rents. AREUEA Journal, 18(3): 302–312.

Benjamin, J., Boyle, G. and Sirmans, C.F., 1992. Price Discrimination in Shopping Center Leases. *Journal of Urban Economics*, 32: 299–317.

Benjamin, J., 1994. "The Changing Retail Real Estate Market Place: An Introduction." *Journal of Real Estate Research*, 9(1), 1-4.

Benjamin, J. and Chinloy, P., 2004. "The Structure of a Retail Lease." *Journal of Real Estate Research,* 26(2), 223-236.

Benjamin, J., Chinloy, P., and Hardin, W., 2006. "Local Presence, Scale and Vertical Integration: Brands as Signals." *Journal of Real Estate Finance and Economics,* 33, 389-403.

Brueckner, J. 1993. Interstore Externalities and Space Allocation in Shopping Centers. Journal of Real Estate Finance and Economics, 7(1): 5–17.

Buttimer, R. and Ott, S., 2007. "Commercial Real Estate Valuation, Development, and Occupancy Under Leasing Uncertainty." *Real Estate Economics,* 35(1), 21-56.

Brown, S. and Warner, J. 1980. "Measuring Security Price Performance," Journal of Financial Economic, Sept. 1980, 8(3), 205-58.

Brown, S. and Warner, J. 1980. "U sing Daily Stock Returns: The Case of Event Studies," Journal of Financial Economic. Mar. 1985, 14(1), pp. 3-31.

Calyton, J., and Mackinnon, G., 2003. "The Relative Importance of Stock, Bond, and Real Estate Factors in Explaining REIT Returns." *Journal of Real Estate Finance and Economics,* 27, 39-60.

Campbell, J., A. W. Lo, AND A. C. Mackinlay, 1997. The Econometrics of Financial Markets. Princeton, New Jersey: Princeton University Press.

Chan, H., Erickson, J. and Wang, K.., 2003. "Real Estate Investment Trusts: Structure, Performance, and Investment Opportunities." Oxford University Press.

Chan, Kam C., Hendershott, P.H. and Sanders, B., 1991. "Risk and Return on Real Estate: Evidence from Equity REITs." *AREUE Journal.*

Chui, A.C., Titman, and Wei, J., 2003. "The cross-section of expected REIT returns." *Real Estate Economics*, 31, 451-479.

Colliers Intentional, 2010. "Retail Trends & Opportunities." Commercial Real Estate Services Industry Report, U.S.A., 2010.

Collin-Dufresne, P., Goldstein, R. and Helwege, J., 2003. "Are Jumps in Corporate Bond Yields Priced? Modeling Contagion Via the Updating of Beliefs." Working paper, University of California, Berkeley.

Das, S., Duffie, D., Kapadia, N. and Saita, L., 2007. "Common Failings: How Corporate Defaults Are Correlated." *Journal of Finance,* 62, 93–117.

Davis, M. and Lo, V., 2001. "Infectious Defaults." *Quantitative Finance,* 1, 382–387.

DeGraba, P., 1992. "No Lease is Short Enough to Solve the Time Inconsistency Problem." *Journal of Industrial Economics,* 42 (4), 361-374.

Dichev, I., and J. Piotroski, 2001, "The Long-Run Stock Returns Following Bond Ratings Changes," *Journal of Finance*, 56, 173-203

Dnes, A., 1993. "A Case-Study Analysis of Franchise Contract." *Journal of Legal Studies,* 22(2), 367-393.

Eaton, B.C. and Lipsey, R.G., 1979. "Comparison Shopping and Clustering of Homogeneous Firms." *Journal of Regional Science*, 19, 421–435.

Eppli, M., Choo, H., and Shilling, J., 2008. "Agglomeration Risk in Retail Shopping Centers." Working Paper.

Eppli, M. and Shilling, J., 1995. "Large-Scale Shopping Center Development Opportunities." *Land Economics,* 71(1), 35-41.

Fama, E., 1998. Market efficiency, long-term returns, and behavioral finance. *Journal of Financial Economics* 49, pp. 283–306

Geltner, D.M., Miller, N.G., Clayton, J., Eichholtz, P., 2007. "Commercial Real Estate Analysis & Investments." (2nd ed. ed.). (J. W. Calhoun, Ed.) Mason, OH, USA: Thompson South-Western.

Giaccotto, C., Goldberg, G., and Hedge, S., 2007. "The Value of Embedded Real Options: Evidence from Consumer Automobile Lease Contracts." *The Journal of Finance,* 62(1), 411-445.

Gibbs, J., and Walter T. Martin, 1958. Urbanization and Natural Resources: A Study in Organizational Ecology, *American Sociological Review*, 23(3), pp. 266-277

Giesecke, K., 2004. "Correlated Default with Incomplete Information." *Journal of Banking and Finance*, 28(7), 1521–1545.

Gould, E., Pashigian, B. P., and Prendergast, C., 2007. "Contracts, Externalities, and Incentives in Shopping Malls." *The Review of Economics and Statistics,* 87(3), 411–422.

Grenadier, S.R., 2005. "An Equilibrium Analysis of Real Estate Leases." *University of Chicago Journal of Business*, 75(4), 1173-1214.

Grenadier, S.R., 1996. "Leasing and Credit Risk." *Journal of Financial Economics*, 42, 333-364.

Hendershortt, P. and Ward, C., 2003. "Valuing and Pricing Retail Leases with Renewal and Overage Options." *Journal of Real Estate Financial and Economics*, 26(2), 223-240.

Holthausen, R. and Leftwich, R., 1986. "The Effect of Bond Rating Changes on Common Stock Prices." *Journal of Financial Economics*, 15, 57-89.

Jarrow, R. and Yu, F., 2001. "Counterparty Risk and the Pricing of Defaultable Securities." *Journal of Finance* , 56, 1765–1800.

Jorion, P. and Zhang, G., 2007."Good and Bad Credit Contagion: Evidence from Credit Default Swaps," *Journal of Financial Economics*, Elsevier, 84(3), 860-883.

Karolyi, G. and Sanders, A., 1998. "The Variation of Economic Risk Premiums in Real Estate Returns." *The Journal of Real Estate Financial Economics,* 17, 245–262.

Kim, C. and Kim, K., 2001. "Short-Term Leases, Long-term Investments, and Tradable Goodwill." *Journal of Housing Economics,* 10, 162-175.

Lang, L. and Stulz, B., 1992. "Contagion and Competitive Intra-industry Effects of Bankruptcy Announcements." *Journal of Financial Economics*, 8, 45–60.

Lee, K. 1995. Optimal Retail Lease Contracts: The Principal-Agent Approach. Regional Science and Urban Economics, 25, 727–738.

Lewis, C. and Schallheim, J., 1992. "Are Debt and Leases Substitutes?" *The Journal of Financial and Quantitative Analysis*, 27(4), 497 -511.

Ling, D.C. and Naranjo, A., 1997. "Economic Risk Factors and Commercial Real Estate Returns." *The Journal of Real Estate Finance and Economics,* 14, 283-307.

Ling, D.C. and Naranjo, A., 1999. "The Integration of Commercial Real Estate Markets and Stock Markets." *Real Estate Economics,* 27, 483-515.

Liu, C., Liu, P., and Zhang, Z., 2010. "Real Assets, liquidation value and choice of financing." Cornell University working paper.

Liu, C., and Mei, J., 1992. "The Predictability of Returns on Equity REITs and Their Co-Movement with Other Assets." *Journal of Real Estate Finance and Economics,* 5, 401-418.

Liu, C. and Mei, J., 1994. "An Analysis of Real Estate Risk Using the Present Value Model." Journal *of Real Estate Finance and Economics,* 8, 5-20.

McCann P. and Ward, C., 2004. "Real Estate Rental Payments: Application of Stock – Inventory Modeling." *Journal of Real Estate Finance and Economics,* 28(2), 273-292.

Mei, J., and Lee, A., 1994. "Is There a Real Estate Factor Premium?" Journal *of Real Estate Finance and Economics, 9, 113-126*.

Mei, J., and Liu, C., 1994. "Predictability of Real Estate Returns and Market Timing." *Journal of Real Estate Finance and Economics, 8,* 115-135.

Miceli, T.J. and C.F. Sirmans. 1995: Contracting with Spatial Externalities and Agency Problems: The Case of Retail Leases. *Regional Science and Urban Economics*, 25, 355–372.

Moody's Investors Service – Global Credit Research, February 2004. "Rating Transitions and Defaults Conditional on Watchlist, Outook and Rating History."

Moody's Investor Service – Global Credit Research, October 1998. "Historical Analysis of Moody's Watchlist."

Mortensen, D., 1982. "The Matching Process as a Noncooperative Bargaining Game." University of Chicago Press: Chicago.

Myer, F. and Neil, J., 1994. "Retail Stock, Retail REITs, and Retail Real Estate." *Journal of Real Estate Research,* 9(1), 65-84.

Ritter, Jay R., 1991. The long-run performance of initial public offerings. *Journal of Finance* 46, 3-27.

Rosenfeldt, P., 2009. "Co-tenancy Issues during Turbulent Times." *ICSC International Outlet Journal*, 2009(12).

Rosiers, F., Theriault, M, and Menetrier, L., 2005. "Spatial versus Non-Spatial Determinants of Shopping Center Rents" Modeling Location and Neighborhood-Related Factors." *Journal of Real Estate Research,* 27(3), 293-320.

Schwartz, E. and Torous, W., 2007. "Commercial Office Space: Testing the Implications of Real Options Models with Competitive Interactions." *Real Estate Economics,* 35(1), 1-20.

Sirmans, C.F., and Guidry, K. A., 1993 . "The Determinants of Shopping Center Rents." *Journal of Real Estate Research*, 8(1), 107-116.

Stahl, K. 1982. "Location and Spatial Pricing with Non-convex Transportation Schedules." Bell Journal, 13, 575–582.

Titman, S. and Tsyplako, S., 2009. "Originator Performance, CMBS Structures and Yield Spread of Commercial Mortgages." *Review of Financial Studies*, 23(9), 2010, 3558-3594.

Wheaton, W**.,** 2002. "Percentage rent in retail leasing: The alignment of landlord-tenant interests." *Real Estate Economics*, 28(2), 185-204.

Wolinsky, A. 1983. "Retail Trade Concentration due to Consumer's Imperfect Information." *Bell Journal of Economics*, 14 (spring),172–184.

Table 1: List of Retail REITs

Table 1 lists all real estate investment trusts with property focus on retail real estate sector including regional mall, shopping center and others. Panel A lists all current REITs as of the year end of 2010. Panel B list all historical REITs. Information on IPO date, total asset as of 2010Q3 are obtained from SNL.

Panel A: List of current REITs

Company Name	Ticker	Current	Property Focus	IPO Date	Assets (2010Q3)
Alexander's, Inc.	ALX	Yes	Regional Mall	7/19/1984	1,717,662
CBL & Associates Properties, Inc.	CBL	Yes	Regional Mall	10/27/1993	7,615,480
Feldman Mall Properties, Inc.	FMLP	Yes	Regional Mall	12/15/2004	148,836
General Growth Properties, Inc.	GGP	Yes	Regional Mall	4/8/1993	27,742,933
Glimcher Realty Trust	GRT	Yes	Regional Mall	1/19/1994	1,741,615
Macerich Company	MAC	Yes	Regional Mall	3/9/1994	7,699,522
Pennsylvania REIT	PEI	Yes	Regional Mall	12/27/1960	3,093,861
Simon Property Group, Inc.	SPG	Yes	Regional Mall	12/13/1993	24,788,287
Taubman Centers, Inc.	TCO	Yes	Regional Mall	11/20/1992	2,529,676
Tanger Factory Outlet Centers, Inc.	SKT	Yes	Outlet Center	6/4/1993	1,197,559
Agree Realty Corporation	ADC	Yes	Single Tenant	4/22/1994	274,057
Getty Realty Corp.	GTY	Yes	Single Tenant	9/30/1971	428,108
National Retail Properties, Inc.	NNN	Yes	Single Tenant	10/9/1984	2,609,755
One Liberty Properties, Inc.	OLP	Yes	Single Tenant	12/20/1982	416,915
Realty Income Corporation	O	Yes	Single Tenant	8/15/1994	3,285,534
Acadia Realty Trust	AKR	Yes	Shopping Center	5/27/1993	1,490,748
Cedar Shopping Centers, Inc.	CDR	Yes	Shopping Center	11/25/1986	1,647,104
Developers Diversified Realty	DDR	Yes	Shopping Center	2/3/1993	7,877,079
Equity One, Inc.	EQY	Yes	Shopping Center	5/13/1998	2,570,370
Excel Trust, Inc.	EXL	Yes	Shopping Center	4/22/2010	318,230
Federal Realty Investment Trust	FRT	Yes	Shopping Center	9/10/1962	3,127,159
Inland Real Estate Corporation	IRC	Yes	Shopping Center	8/14/2002	1,232,183
Kimco Realty Corporation	KIM	Yes	Shopping Center	11/22/1991	9,814,508
Kite Realty Group Trust	KRG	Yes	Shopping Center	8/10/2004	1,133,219
Ramco-Gershenson Properties	RPT	Yes	Shopping Center	5/31/1996	1,010,821
Regency Centers Corporation	REG	Yes	Shopping Center	10/29/1993	3,993,674
Retail Opportunity Investments	ROIC	Yes	Shopping Center	10/17/2007	428,304
Roberts Realty Investors, Inc.	RPI	Yes	Shopping Center	12/9/1997	69,727
Saul Centers, Inc.	BFS	Yes	Shopping Center	8/19/1993	970,464
Urstadt Biddle Properties Inc.	UBA	Yes	Shopping Center	7/6/1969	548,926
Weingarten Realty Investors	WRI	Yes	Shopping Center	8/16/1985	4,810,081
Whitestone REIT	WSR	Yes	Shopping Center	8/25/2010	198,365

Panel B: List of hostorical REITs

Company Name	Ticker	Current	Property Focus	IPO Date	Assets (2010Q3)
Arbor Property Trust	-	No	Regional Mall	2/28/1994	NA
Crown American Realty Trust	-	No	Regional Mall	8/9/1993	NA
DeBartolo Realty Corporation	-	No	Regional Mall	4/14/1994	NA
EQK Realty Investors I	-	No	Regional Mall	3/12/1985	NA
JP Realty, Inc.	-	No	Regional Mall	1/13/1994	NA
Mills Corporation	-	No	Regional Mall	4/21/1994	NA
Rouse Company	-	No	Regional Mall	1/15/1957	NA
Urban Shopping Centers, Inc.	-	No	Regional Mall	10/14/1993	NA
Chelsea Property Group, Inc.	-	No	Outlet Center	10/26/1993	NA
Horizon Group Properties, Inc.	-	No	Outlet Center	11/8/1993	NA
Horizon Group, Inc.	-	No	Outlet Center	11/2/1993	NA
McArthur/Glen Realty Corp.	-	No	Outlet Center	10/21/1993	NA
Prime Retail, Inc.	-	No	Outlet Center	3/15/1994	NA
JDN Realty Corporation	-	No	Power Center	3/29/1994	NA
Price REIT, Inc.	-	No	Power Center	12/3/1991	NA
Aegis Realty, Inc.	-	No	Shopping Center	10/10/1997	NA
AmREIT	-	No	Shopping Center	7/23/2002	NA
Atlantic Realty Trust	-	No	Shopping Center	5/14/1996	NA
Bradley Real Estate, Inc.	-	No	Shopping Center	1/27/1961	NA
Burnham Pacific Properties, Inc.	-	No	Shopping Center	1/15/1987	NA
Center Trust, Inc.	-	No	Shopping Center	12/27/1993	NA
Excel Realty Trust, Inc.	-	No	Shopping Center	8/4/1993	NA
First Washington Realty Trust, Inc.	-	No	Shopping Center	6/27/1995	NA
Heritage Property Investment Trust	-	No	Shopping Center	4/23/2002	NA
IRT Property Company	-	No	Shopping Center	4/29/1971	NA
Konover Property Trust, Inc.	-	No	Shopping Center	6/3/1993	NA
Kramont Realty Trust	-	No	Shopping Center	12/29/1988	NA
Kranzco Realty Trust	-	No	Shopping Center	11/12/1992	NA
Malan Realty Investors, Inc.	-	No	Shopping Center	6/16/1994	NA
Mid-America Realty Investments, Inc.	-	No	Shopping Center	12/30/1986	NA
Mid-Atlantic Realty Trust	-	No	Shopping Center	9/11/1993	NA
MSA Realty Corporation	-	No	Shopping Center	3/29/1984	NA
New Plan Excel Realty Trust, Inc.	-	No	Shopping Center	7/1/1962	NA
Pan Pacific Retail Properties, Inc.	-	No	Shopping Center	8/7/1997	NA
Philips International Realty	-	No	Shopping Center	5/7/1998	NA
Price Legacy Corporation	-	No	Shopping Center	12/21/1994	NA
Tucker Properties Corporation	-	No	Shopping Center	10/5/1993	NA
United Investors Realty Trust	-	No	Shopping Center	3/10/1998	NA
USP Real Estate Investment Trust	-	No	Shopping Center	4/25/1978	NA
Western Properties Trust	-	No	Shopping Center	6/13/1984	NA
Westfield America, Inc.	-	No	Shopping Center	5/15/1997	NA

Table 2:Private Defunct Retailers

Table 2 lists private retailers that are defunct since 1999 and their landlord real estate investment trust at the time of bankruptcy announcement.

Private Retailer	Defunct Date	Landlord U.S. Public REITs		
Boscov's Department Stores LLC	9/4/09	Simon Property Group Inc.		
KB Toys Inc.	2/9/09	General Growth Properties Inc.	Pennsylvania REIT	Acadia Realty Trust
Mervyns	7/21/08	Developers Diversified Realty	Macerich	
Steve and Barry's	7/9/08	General Growth Properties	Glimcher Realty Trust	CBL & Associates
		Simon Property Group	Pennsylvania REIT	Macerich
Goody's Family Clothing Inc.	6/9/08	Developers Diversified Realty		
Linens 'N Things	5/2/08	Ramco-Gershenson Properties	First Capital Realty Inc.	EDT Retail Trust
		Weingarten Realty Investors	Kimco Realty	AmREIT
Wickes Furniture Store	2/3/08	Inland Real Estate Corp.		
Farmer Jack	7/7/07	Ramco-Gershenson Properties		
CompUSA	5/14/07	Crescent Real Estate Equities	Federal Realty Investment	
Montgomery Ward & Co. Inc.	12/28/00	Ramco-Gershenson Properties		
Caldor Inc.	5/15/99	Alexander's Inc.		

Table 3: Average CARs under constant return model and market model

Table 3 presents the average percentage abnormal return (AR), cumulative abnormal return (CAR) (starting from -30 trading day before the event) for various trading day windows. The constant return model uses the constant mean of historical return as the normal performance for the security of interest. The market model uses fitted value from a market model regression as normal performance.

Trading	Constant Return Model		Market Model	
Days	AR	CAR	AR	CAR
-24	-0.483	-1.338	-0.241	-0.070
-23	-0.041	-1.379	-0.338	-0.408
-22	-0.701	-2.080	0.003	-0.405
-21	0.411	-1.669	-0.123	-0.528
-20	0.093	-1.576	0.281	-0.247
-19	0.072	-1.504	0.241	-0.006
-18	-0.784	-2.288	0.058	0.052
-17	0.229	-2.060	-0.123	-0.071
-16	0.134	-1.925	0.047	-0.025
-15	-0.010	-1.935	-0.091	-0.116
-14	-0.613	-2.548	0.045	-0.071
-13	-0.722	-3.270	-0.635	-0.707
-12	-0.710	-3.980	-0.154	-0.860
-11	-0.129	-4.109	0.004	-0.856
-10	-0.867	-4.976	-0.306	-1.162
-9	1.433	-3.543	0.125	-1.038
-8	-0.327	-3.870	0.176	-0.862
-7	0.361	-3.510	0.107	-0.755
-6	0.761	-2.749	0.168	-0.587
-5	-0.526	-3.275	-0.084	-0.670
-4	0.290	-2.985	-0.040	-0.711
-3	-1.042	-4.026	-0.351	-1.062
-2	-0.718	-4.745	-0.011	-1.073
-1	0.877	-3.897	0.097	-0.961
0	-1.181	-5.060	-0.434	-1.411
+1	-0.314	-5.407	-0.321	-1.722
+2	-0.541	-5.912	-0.162	-1.890
+3	0.533	-5.378	0.131	-1.759
+4	-0.813	-6.192	-0.394	-2.153
+5	-0.210	-6.402	-0.169	-2.322
+6	0.314	-6.088	0.054	-2.268
+7	-0.889	-6.977	-0.261	-2.529
+8	-0.846	-7.824	-0.236	-2.765
+9	0.265	-7.558	-0.648	-3.414
+10	1.412	-6.146	0.687	-2.727
+11	-0.135	-6.281	0.208	-2.519
+12	0.055	-6.227	-0.203	-2.722
+13	-0.450	-6.677	0.101	-2.621
+14	-1.108	-7.785	-0.641	-3.262
+15	0.403	-7.382	0.003	-3.260
+16	0.602	-6.781	0.135	-3.125
+17	0.225	-6.556	0.487	-2.637
+18	0.040	-6.516	-0.344	-2.982
+19	1.818	-4.698	0.765	-2.217
+20	-0.363	-5.061	-0.034	-2.251
+21	-0.207	-5.268	-0.078	-2.330
+22	-0.964	-6.232	-0.325	-2.654
+23	1.195	-5.037	0.149	-2.506
+24	-0.814	-5.851	-0.093	-2.599

Table 4: Average BHARs under different benchmark indexes

Table 4 presents the percentage cumulative buy-and-hold abnormal return (starting from -30 trading day before the event) for various trading day windows. The cumulative abnormal return from buy-and-hold strategy (BHAR) is calculated as the return on a buy-and-hold investment in the sample firm less the return on a buy-and-hold investment in a portfolio with an appropriate CRSP/Ziman index.

Trading Days	Buy-and-Hold Abnormal Return		
	All REITs	Equity REITs	Retail REIT
-24	-0.153	-0.104	0.001
-23	-0.521	-0.463	-0.566
-22	-0.367	-0.295	-0.363
-21	-0.598	-0.479	-0.549
-20	-0.549	-0.471	-0.403
-19	-0.265	-0.115	-0.046
-18	-0.082	0.028	0.102
-17	-0.241	-0.092	0.015
-16	-0.374	-0.173	-0.041
-15	-0.312	-0.151	0.140
-14	-0.300	-0.119	0.124
-13	-0.683	-0.575	-0.338
-12	-1.029	-0.875	-0.533
-11	-0.824	-0.689	-0.255
-10	-1.036	-0.856	-0.371
-9	-1.143	-0.953	-0.535
-8	-1.047	-0.875	-0.393
-7	-1.046	-0.869	-0.455
-6	-1.147	-1.013	-0.625
-5	-1.295	-1.127	-0.863
-4	-1.326	-1.114	-0.873
-3	-1.428	-1.271	-1.042
-2	-1.410	-1.233	-1.133
-1	-1.311	-1.157	-1.074
0	-1.764	-1.504	-1.412
+1	-1.734	-1.570	-1.448
+2	-1.919	-1.722	-1.669
+3	-1.680	-1.489	-1.317
+4	-1.734	-1.527	-1.329
+5	-1.805	-1.606	-1.464
+6	-1.815	-1.604	-1.466
+7	-1.676	-1.459	-1.358
+8	-1.571	-1.392	-1.340
+9	-1.844	-1.653	-1.454
+10	-1.791	-1.607	-1.504
+11	-1.903	-1.702	-1.632
+12	-2.174	-1.961	-1.901
+13	-2.082	-1.870	-1.818
+14	-2.110	-1.922	-1.848
+15	-2.382	-2.195	-2.097
+16	-2.512	-2.307	-2.138
+17	-1.947	-1.804	-1.568
+18	-2.447	-2.233	-1.999
+19	-2.137	-2.012	-1.824
+20	-2.060	-1.931	-1.808
+21	-2.166	-2.037	-1.930
+22	-2.252	-2.139	-2.107
+23	-2.287	-2.184	-2.038
+24	-2.216	-2.089	-1.989

Table 5: Stock Price Response to Tenant Bankruptcy

Mean estimates of cumulative abnormal returns (CARs) and buy-and-hold abnormal returns, their t-statistics (in the line below mean estimates), and number of observations are shown for various post-event windows following a tenant bankruptcy event. Event date is the date of bankruptcy filling. 0 to +1 is two day returns after the event; while 0 to +4 is 5 day cumulative return. CARs are estimated using both market model and constant return model. BHARs are estimated with three REIT indexes as expected return: all REIT index from Ziman, Equity REIT index and Retail REIT index.

Trading Days	CAR					BHAR					
	N	Market Model		Constant Return Model		ALL REIT		Equity REIT		Retail REIT	
Event Date	161	-0.434	**	-1.181	***	-0.502	**	-0.393	**	-0.327	*
		-2.228		-3.819		-2.395		-1.990		-1.754	
0 to +1	159	-0.760	***	-1.510	***	-0.684	***	-0.666	***	-0.551	**
		-2.763		-3.427		-2.628		-2.595		-2.217	
0 to +4	161	-1.345	***	-2.523	***	-0.933	*	-0.878	*	-0.702	
		-2.819		-3.330		-1.816		-1.724		-1.456	

Table 6: REIT risk dynamics before and after major tenant bankruptcy

Table 6 reports a risk measure of REIT stock abnormal return before and after a bankruptcy event of REIT's major tenants. The risk dynamics is measured as the annualized standard deviation of BHAR for various windows.

Trading Days	BHAR return volatility (Benchmark to all REITs) Volatility	Range
-90 to -60	0.065	(0.016 , 0.495)
-60 to -30	0.067	(0.016 , 0.530)
-30 to 0	0.069	(0.015 , 0.329)
0 to +30	0.070	(0.014 , 0.401)

Trading Days	BHAR return volatility dynamics (Benchmark to all REITs) Volatility	Range
-90 to -30	0.048	(0.012 , 0.360)
-30 to +30	0.050	(0.012 , 0.252)

Trading Days	BHAR return volatility dynamics (Benchmark to equity REITs) Volatility	Range
-90 to -60	0.065	(0.016 , 0.495)
-60 to -30	0.066	(0.016 , 0.526)
-30 to 0	0.068	(0.015 , 0.323)
0 to +30	0.069	(0.014 , 0.398)

Trading Days	BHAR return volatility dynamics (Benchmark to equity REITs) Volatility	Range
-90 to -30	0.048	(0.012 , 0.358)
-30 to +30	0.050	(0.012 , 0.251)

Trading Days	BHAR return volatility dynamics (Benchmark to retail REITs) Volatility	Range
-90 to -60	0.065	(0.014 , 0.484)
-60 to -30	0.068	(0.014 , 0.526)
-30 to 0	0.070	(0.015 , 0.313)
0 to +30	0.070	(0.013 , 0.381)

Trading Days	BHAR return volatility dynamics (Benchmark to retail REITs) Volatility	Range
-90 to -30	0.048	(0.011 , 0.353)
-30 to +30	0.050	(0.010 , 0.240)

Table 7: Cross-sectional analysis of abnormal performance of landlord stocks
following a tenant bankruptcy during various post-event periods

Panel A: CAR

	Trading	Intercept			Location Quality			Tenant Exposure				Adj.
	Days	Estimate	t Value	p Value	Estimate	t Value	p Value	Estimate	t Value	p Value	N	R^2
CAR market model	+1	-1.951	-2.12	0.036 **	2.141	2.11	0.036 **				160	0.02
	+1	-2.393	-2.60	0.010 **	2.629	2.60	0.010 **	-0.067	-2.64	0.009 ***	160	0.06
	+2	-2.952	-2.37	0.019 **	3.238	2.36	0.020 **				160	0.03
	+2	-3.270	-2.58	0.011 **	3.590	2.58	0.011 **	-0.048	-1.38	0.169	160	0.03
	+5	-1.891	-1.48	0.140	2.076	1.48	0.141				160	0.01
	+5	-2.261	-1.75	0.082 *	2.485	1.75	0.082 *	-0.056	-1.57	0.118	160	0.02
CAR constant return model	+1	-3.027	-1.74	0.083 *	3.316	1.74	0.085 *				160	0.01
	+1	-3.275	-1.85	0.066 *	3.591	1.85	0.067 *	-0.038	-0.77	0.442	160	0.01
	+2	-3.646	-1.84	0.068 *	3.993	1.83	0.069 *				160	0.01
	+2	-3.744	-1.85	0.066 *	4.102	1.84	0.067 *	-0.015	-0.27	0.790	160	0.01
	+5	0.097	0.06	0.952	-0.114	-0.07	0.948				160	0.01
	+5	-0.078	-0.05	0.962	0.079	0.04	0.965	-0.026	-0.59	0.555	160	0.01

Panel B: BHAR

	Trading	Intercept			Location Quality			Tenant Exposure				Adj.
	Days	Estimate	t Value	p Value	Estimate	t Value	p Value	Estimate	t Value	p Value	N	R^2
	+1	-2.187	-2.31	0.023 **	2.399	2.30	0.023 **				160	0.03
	+1	-2.605	-2.74	0.007 ***	2.861	2.74	0.007 ***	-0.063	-2.41	0.017 **	160	0.06
BHAR	+2	-2.660	-2.30	0.023 **	2.917	2.29	0.023 **				160	0.03
all REITs	+2	-2.986	-2.55	0.012 **	3.278	2.54	0.012 **	-0.049	-1.53	0.129	160	0.03
	+5	-4.588	-2.05	0.042 **	5.035	2.04	0.043 **				160	0.02
	+5	-4.536	-1.98	0.049 **	4.977	1.98	0.050 **	0.008	0.13	0.900	160	0.01
	+1	-1.698	-1.90	0.060 *	1.864	1.89	0.060 *				160	0.02
	+1	-2.136	-2.39	0.018 **	2.347	2.39	0.018 **	-0.066	-2.69	0.008 ***	160	0.05
BHAR	+2	-2.491	-2.18	0.031 **	2.732	2.18	0.031 **				160	0.02
equity REITs	+2	-2.817	-2.44	0.016 **	3.092	2.43	0.016 **	-0.049	-1.55	0.124	160	0.03
	+5	-4.280	-1.92	0.056 *	4.697	1.92	0.057 *				160	0.02
	+5	-4.232	-1.87	0.064 *	4.644	1.86	0.065 *	0.007	0.12	0.908	160	0.01
	+1	-1.390	-1.64	0.103	1.525	1.64	0.103				160	0.01
	+1	-1.849	-2.20	0.029 **	2.033	2.20	0.029 **	-0.069	-3.00	0.003 ***	160	0.06
BHAR	+2	-2.026	-1.81	0.072 *	2.222	1.81	0.073 *				160	0.01
retail REITs	+2	-2.381	-2.11	0.037 **	2.615	2.10	0.037 **	-0.054	-1.72	0.087 *	160	0.03
	+5	-3.972	-1.86	0.065 *	4.361	1.86	0.065 *				160	0.02
	+5	-4.126	-1.90	0.060 *	4.532	1.89	0.060 *	-0.023	-0.39	0.698	160	0.01

Table 8: Cross-sectional analysis of abnormal performance of landlord stocks
following a tenant bankruptcy by sample of public tenant bankruptcy and prive tenant bankruptcy

Panel A: CAR

		Intercept			Location Quality			Tenant Exposure				Adj.
	Sample	Estimate	t Value	p Value	Estimate	t Value	p Value	Estimate	t Value	p Value	N	R^2
CAR market model	all	-1.951	-2.12	0.036 **	2.141	2.11	0.036 **				160	0.02
	all	-2.393	-2.60	0.010 **	2.629	2.6	0.010 **	-0.067	-2.64	0.009 ***	160	0.06
	public	-1.866	-1.78	0.077 *	2.047	1.78	0.078 *				140	0.02
	public	-2.363	-2.25	0.026 **	2.597	2.25	0.026 **	-0.065	-2.39	0.018 **	140	0.05
	private	-2.460	-1.98	0.064 *	2.703	1.97	0.064 *				20	0.13
	private	-2.503	-2.26	0.037 **	2.756	2.27	0.037 **	-0.397	-2.42	0.027 **	20	0.32
CAR constant return model	all	-3.027	-1.74	0.083 *	3.316	1.74	0.085 *				160	0.01
	all	-3.275	-1.85	0.066 *	3.591	1.85	0.067 *	-0.038	-0.77	0.442	160	0.01
	public	-3.781	-1.98	0.050 **	4.148	1.97	0.050 *				140	0.02
	public	-4.207	-2.16	0.033 **	4.619	2.16	0.033 **	-0.055	-1.1	0.271	140	0.02
	private	1.519	0.44	0.663	-1.703	-0.45	0.657				20	0.04
	private	1.577	0.46	0.650	-1.775	-0.47	0.643	0.533	1.05	0.308	20	0.04

Panel B: BHAR

		Intercept			Location Quality			Tenant Exposure				Adj.
	Sample	Estimate	t Value	p Value	Estimate	t Value	p Value	Estimate	t Value	p Value	N	R^2
BHAR all REITs	all	-2.187	-2.31	0.023 **	2.399	2.3	0.023 **				160	0.03
	all	-2.605	-2.74	0.007 ***	2.861	2.74	0.007 ***	-0.063	-2.41	0.017 **	160	0.06
	public	-2.186	-2.02	0.045 **	2.398	2.02	0.046 **				140	0.02
	public	-2.671	-2.46	0.015 **	2.934	2.45	0.015 **	-0.063	-2.25	0.026 **	140	0.05
	private	-2.184	-1.96	0.066 *	2.398	1.96	0.066 *				20	0.13
	private	-2.201	-1.97	0.066 *	2.419	1.97	0.066 *	-0.155	-0.94	0.362	20	0.12
BHAR equity REITs	all	-1.698	-1.90	0.060 *	1.864	1.89	0.060 *				160	0.02
	all	-2.136	-2.39	0.018 **	2.347	2.39	0.018 **	-0.066	-2.69	0.008 ***	160	0.05
	public	-1.613	-1.58	0.116	1.770	1.58	0.117				140	0.01
	public	-2.122	-2.08	0.039 **	2.332	2.08	0.040 **	-0.066	-2.52	0.013 **	140	0.05
	private	-2.222	-1.97	0.064 *	2.440	1.97	0.065 *				20	0.13
	private	-2.240	-1.98	0.064 *	2.462	1.98	0.064 *	-0.165	-0.98	0.339	20	0.13
BHAR retail REITs	all	-1.390	-1.64	0.103	1.525	1.64	0.103				160	0.01
	all	-1.849	-2.20	0.029 **	2.033	2.2	0.029 **	-0.069	-3.00	0.003 ***	160	0.06
	public	-1.320	-1.37	0.173	1.449	1.37	0.174				140	0.01
	public	-1.857	-1.94	0.055 *	2.042	1.94	0.055 *	-0.070	-2.82	0.005 ***	140	0.05
	private	-1.818	-1.70	0.107	1.996	1.69	0.108				20	0.09
	private	-1.830	-1.68	0.111	2.011	1.68	0.111	-0.109	-0.68	0.507	20	0.06

Table 9: Summary statistics and correlation matrix

	Summary Statistics				
	N	Mean	Std Dev	Minimum	Maximum
Location Quality	160	0.909	0.002	0.903	0.913
Tenant Exposure	160	3.648	7.829	0.000	60.000
Size	160	14.501	1.248	9.835	17.202
Leverage	160	49.039	17.749	0.000	97.800

	Pearson Correlation Matrix			
	Location Quality	Tenant Exposure	Size	Leverage
Location Quality	1	0.183	0.067	-0.113
Tenant Exposure	0.183	1	-0.574	-0.330
Size	0.067	-0.574	1	0.180
Leverage	-0.113	-0.330	0.180	1

Table 10: Cross-sectional analysis of abnormal performance of landlord stocks following a tenant bankruptcy with firm level controls

Panel A: CARs

	CAR Two-Day Return Market Model			CAR Two-Day Return Constant Return Model		
Location Quality	3.238 ***	3.590 ***	3.733 ***	3.993 ***	4.102 ***	4.814 ***
	(1.372)	(1.392)	(1.394)	(2.181)	(2.225)	(2.194)
Tenant Exposure		-0.048 ***	-0.111 ***		-0.015 ***	-0.162 ***
		(0.035)	(0.044)		(0.056)	(0.069)
Size			-0.003 ***			-0.010 ***
			(0.003)			(0.004)
Leverage			-0.111 ***			-0.162 ***
			(0.044)			(0.069)
Intercept	-2.952 ***	-3.270 ***	-3.330 ***	-3.646 ***	-3.744 ***	-4.210 ***
	(1.248)	(1.265)	(1.260)	(1.983)	(2.023)	(1.984)
Adj R-Sq	0.028	0.034	0.078	0.015	0.009	0.083
N	160	160	160	160	160	160

Panel B: BHARs

	BHAR Two-Day Return All REIT index			BHAR Two-Day Return Equity REIT index			BHAR Two-Day Return Retail REIT index		
Location Quality	2.917 ***	3.278 ***	3.726 ***	2.732 ***	3.092 ***	3.531 ***	2.222 ***	2.615 ***	3.052 ***
	(1.273)	(1.289)	(1.288)	(1.256)	(1.272)	(1.267)	(1.23)	(1.244)	(1.252)
Tenant Exposure		-0.049 ***	-0.126 ***		-0.049 ***	-0.127 ***		-0.054 ***	-0.121 ***
		(0.032)	(0.041)		(0.032)	(0.04)		(0.031)	(0.04)
Size			-0.005 ***			-0.005 ***			-0.005 ***
			(0.002)			(0.002)			(0.002)
Leverage			-0.126 ***			-0.127 ***			-0.121 ***
			(0.041)			(0.04)			(0.04)
Intercept	-2.660 ***		-3.295 ***	-2.491 ***	-2.817 ***	-3.117 ***	-2.026 ***	-2.381 ***	-2.691 ***
	1.157		(1.164)	(1.142)	(1.156)	(1.145)	(1.119)	(1.131)	(1.131)
Adj R-Sq	0.026	0.034	0.083	0.023	0.032	0.085	0.014	0.026	0.062
N	160	160	160	160	160	160	160	160	160

Figure 1: Bankruptcy filing distribution by year 1980 - 2010

Figure 1 presents historical Chapter 11 bankruptcy cases in the United States filed during 1980 - 2010. The data is from bankruptcy research database (BRD) compiled by professor Lynn M. LoPucki at UCLA law school. BRD contains all chapter 11 bankruptcy cases filed by companies that 1) have assets worth $100 million or more at the time of filing, measured in 1980 dollars, and 2) are required to file 10-ks with the SEC. The total number of bankruptcy fillings are further decomposed by industry: Mining, Construction, Manufacturing, Transportation, Communications and utility, Whole sale, Retail trade, Finance, insurance and real estate, and Services.

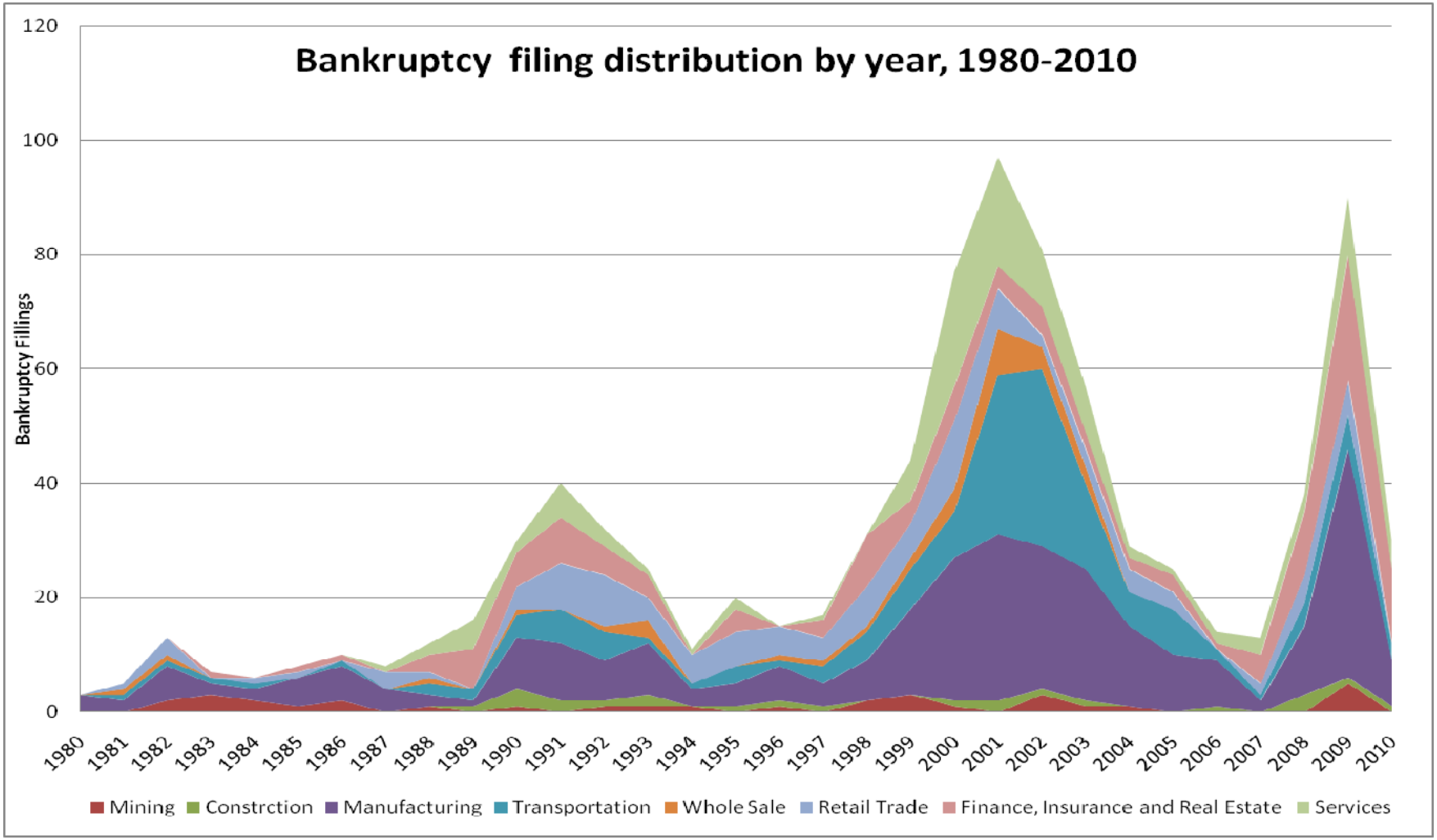
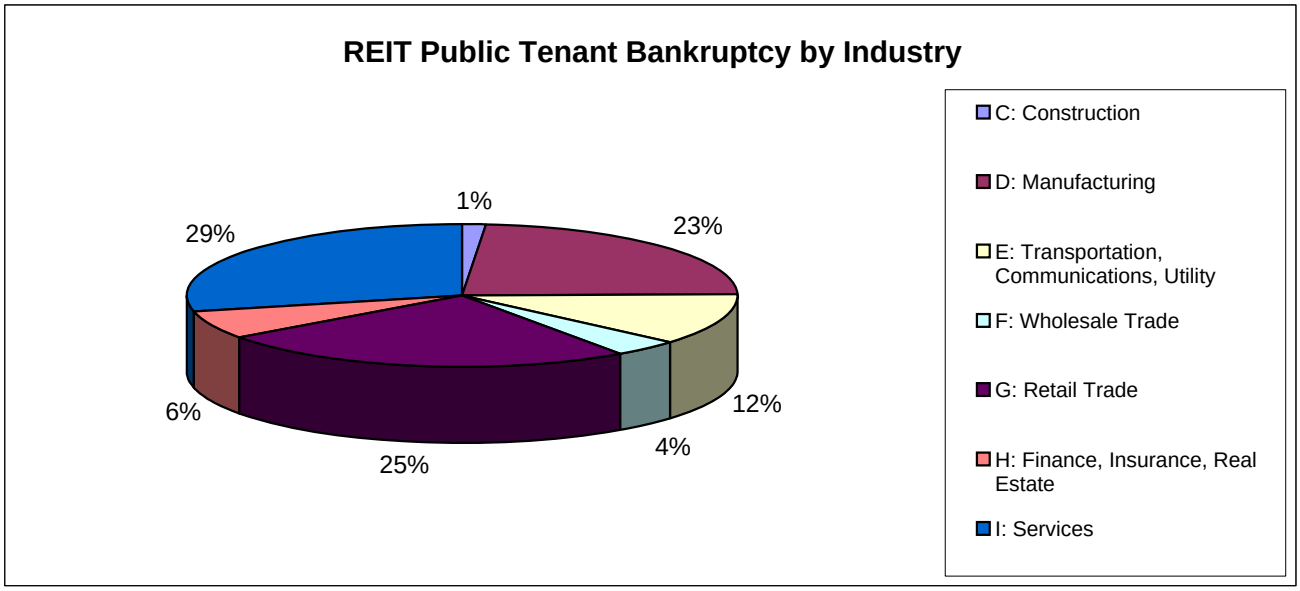


Figure 2: Chapter 11 Bankruptcy Fillings by REIT Public Tenants 1999-2010

Figure 2 presents the total number of bankruptcy cases fied by public tanants of REITs during 1999 to 2010. Panel A is percentage of chapter 11 filings by industry. Panel B is total number of bankruptcy fillings by year.

Panel A: Public tenant bankruptcy by industry



Panel B: Public tenant bankruptcy by year

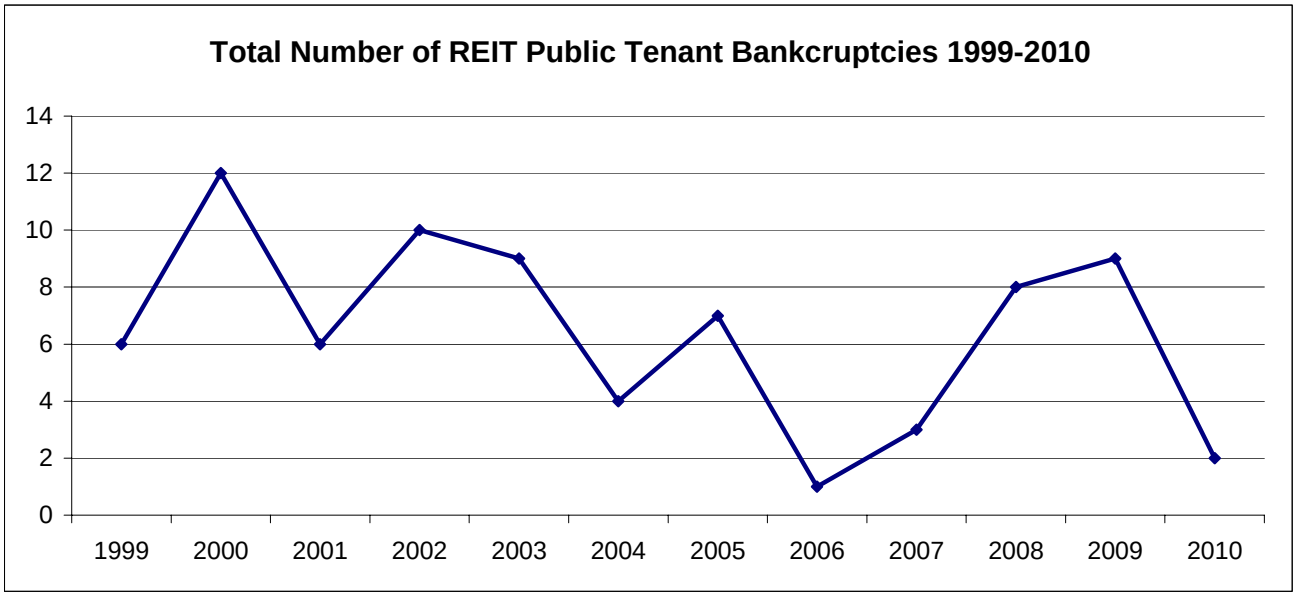


Figure 3: Defaunct Retailers in the U.S. 1950 - 2010 by Industry

Across the United States a large number of local stores and retail chains became defunct between the 1950s, when modern shopping centers were introduced, and the 1980s, when many chains were either consolidated or liquidated. Some have been lost due to mergers. Figure xxx lists defunct retailers of the United States by industry. Source: Wikipedia.

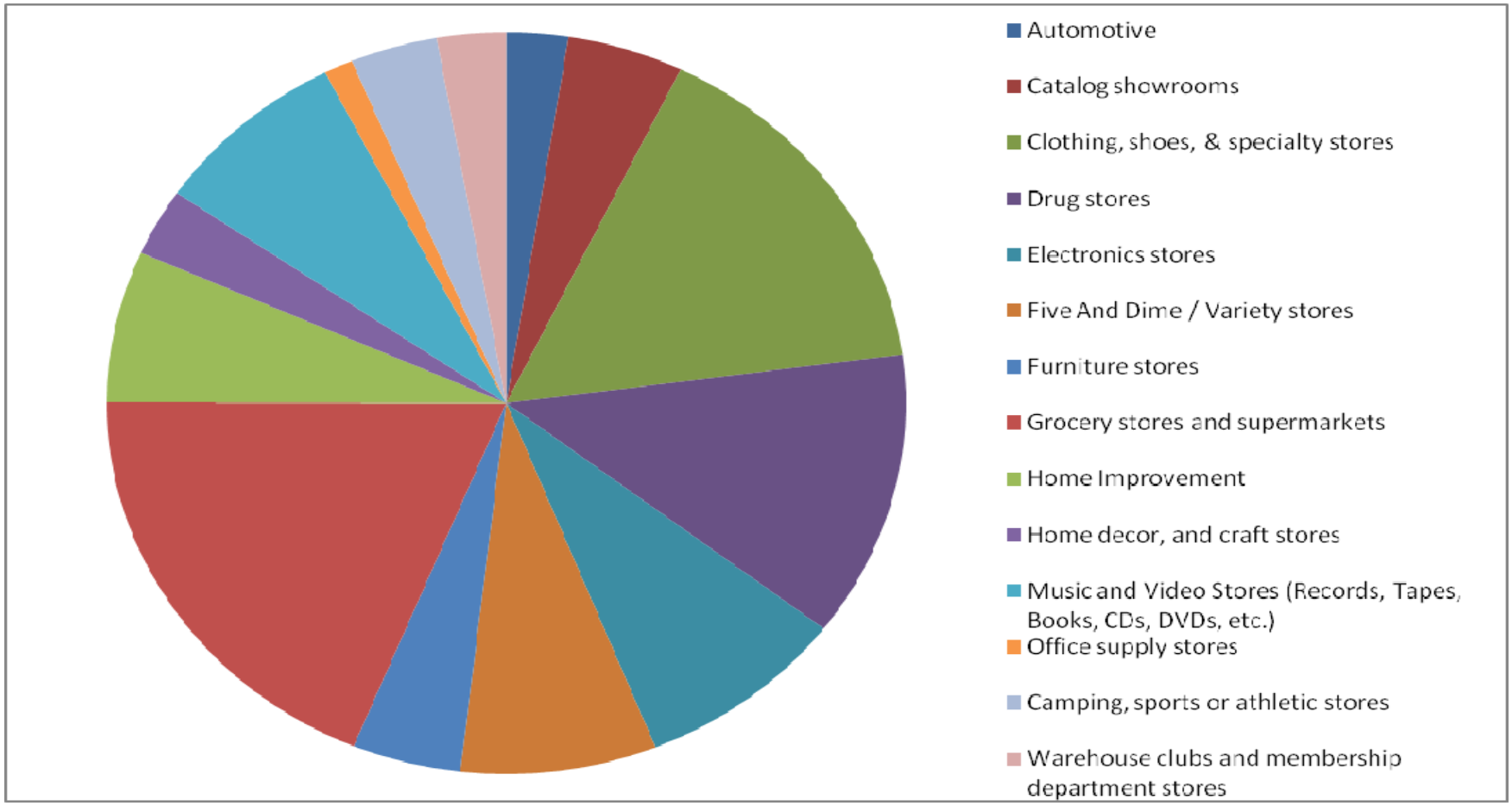


Figure 4: Defunct Department Stores in the U.S. by State

Figure 4 presents the number of defunct department stores of the United States by state. The stores on this list range from small-town one-unit stores to big city mega-chains that have disappeared over the past 100 years, including both traditional department stores and discount stores. Many department stores went out of business or lost their identities between 1990 and 2005 as the result of a complex series of corporate mergers and acquisitions that involved Federated Department Stores and The May Department Stores Company and that resulted in many stores becoming units of Macy's, Inc. This list excludes 86 department stores that involved with Federated and May. Source: Wikipedia.

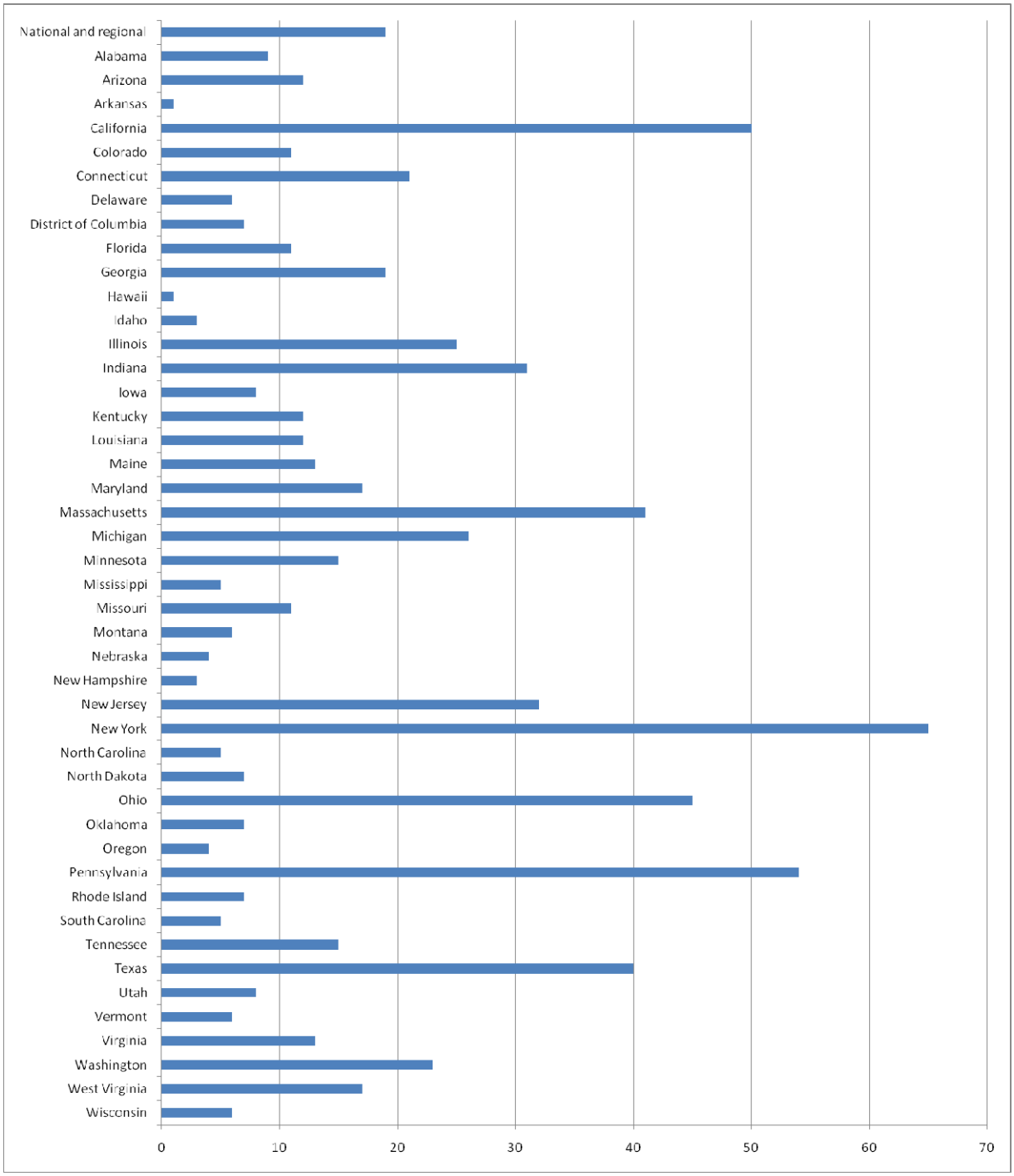


Figure 5: Time Line for Bankruptcy Event Study

Figure 5 illustrates the timing sequence of the event study. The event date is defined as the date of bankruptcy filling of a public tenant.

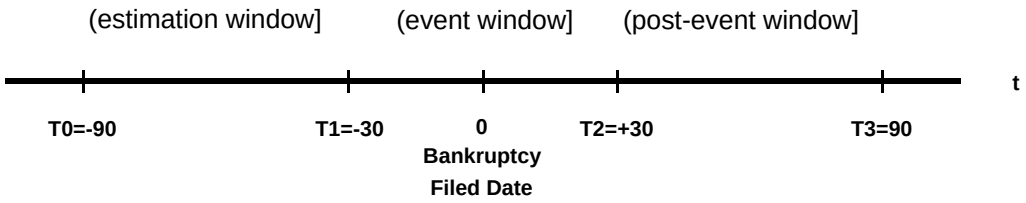


Figure 6: Average Abnormal Return Following Tenant Bankruptcy

Figure 6 presents the abnormal returns averaged across the 160 observations following the Chapter 11 bankruptcy filling of a major tenant. The solid line plots the cumulative abnormal return and the dashed line plots the buy-and-hold abnormal return.