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

Authors Crocker Liu and Peng Liu

Abstract

We explore the economic dependence and financial market feedback effects among firms with economic linkages, notably landlord-tenant when shocks occur to the system. In particular, we examine 157 major tenant bankruptcy announcements of retail real estate firms over the 2000 to 2010 period. The contracting mechanism associated with retail leases provides several unique features such as percentage rents and co-tenancy clauses that are absent in other type of leases. We find that in a good economy, a tenant bankruptcy has a less negative or more positive effect on a landlord's stock return, which is consistent with the growth option hypothesis. We also find that landlords who have properties located in markets with a highly diversified economic base are more likely to exercise the growth option given a tenant departure and thus realize higher stock returns.

Financial market feedback effects between economically linked firms in the economy are of broad interest. Some economic links are direct and contractual, such as landlord-tenant or customer-supplier relationships, while others are indirect and implicit. These effects are elevated during periods of financial distress. Using contractual relationships between landlord and tenants in the retail real estate setting, we study economic dependence and financial market feedback between firms with economic linkages. We focus on the stock market responses of real estate owners [real estate investment trusts (REITs)] following bankruptcy announcements by their major tenants. With rental payments contracted in commercial leases, the departure of a major tenant will result in a direct loss of revenue for a property owner. However, the owner's stock return is far from a one-to-one mapping to revenue contributions. The owner's financial distress may be contagious among tenants in a retail center due to shocks involving macro- and local economic conditions. The owner may suffer higher revenue losses from overage-rent payments or a domino effect from the exercise of contingent lease provisions if the bankrupted tenant is an anchor. If, in contrast, the tenant bankruptcy is a result of industry competition, the owner may benefit from the wealth effect when re-tenanting the vacated space to rivals of the failed tenant. By replacing the old lease (very likely at below-market rents), the owner can

achieve revenue growth through leasing the space at market rent to the rival survivors who may have gained greater market share.

Prior research in this area examines the intra-industry valuation consequences of firm bankruptcy, but provides little evidence pertaining to stock market feedback effects vis-à-vis the links involved in landlord-tenant relationships in the retail real estate setting. Lang and Stulz (1992) is one of the first studies to empirically investigate contagion and the competitive intra-industry effects of bankruptcy announcements. The industry contagion effect arises because the adverse performance of a distressed firm should impact all firms that share similar cash flow characteristics. In addition, however, a bankruptcy announcement may indicate that a firm is doing poorly relative to its industry rivals; in that case, competitors benefit via a wealth re-distribution effect. Overall, Lang and Stulz (1992) documented that bankruptcy announcements decrease the value of a value-weighted portfolio of competitors by 1%. Consistent with this view, Ferris, Jayaraman, and Makhija (1997), Slovin, Sushka, and Polonchek (1999), and Kang and Stulz (2000) find similar results using samples taken from commercial banks in the United States, with matched firms using subsequent bankruptcies as a proxy for contagion, and Japanese firms, respectively. Two recent publications broaden the investigation of the intra-industry effect of bankruptcy by examining the wealth effect of distress and bankruptcy filing for suppliers and customers of filing firms. Hertzel, Li, Officer, and Rodgers (2008) find that neither suppliers nor customers appear to be significantly impaired by the competitive benefits of a filing firm's bankruptcy. Cohen and Frazzini (2008) suggest that customer-supplier links in a firm's product market are not fully transmitted to the financial market. Buying (selling) a supplier firm following a positive (negative) shock to its customers results in predictable return. The authors attribute such predictable abnormal return to investors' limited attention.

Real estate owners, who lease retail space to tenant firms from various industries, present a unique opportunity to study the announcement effect associated with firm bankruptcies. The owners of shopping centers are incentivized to exercise their flexibility for selecting tenants and thus create an optimal tenant mix. Therefore, an owner firm's performance should be affected by the joint intra-industry effect of contagion and competition from several industries that rely on retail stores to market their products. Retail leases exhibit several features, such as percentage rents and contingency provisions, that are not found in leases for other property types. In contrast to a typical real estate lease contract, which provides for 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 (Benjamin, 1993; Colwell and Munneke, 1998; Benjamin and Chinloy, 2004; and Williams, 2011). It is widely recognized in the literature that stores in shopping centers generate business traffic or sales externality involving other retail tenants, as customers practice "complementary" or "comparison" shopping (Eaton and Lipsey, 1979; and Wolinsky, 1983). On the one hand, a percentage rent provides a risk-sharing mechanism with which to address business uncertainty (Miceli and

Sirmans, 1995) and better aligns incentives between tenant and landlord (Brueckner, 1993; Lee, 1995). On the other hand, a percentage lease contract creates business interdependence. A key tenant bankruptcy or store closure can significantly affect a landlord's performance. Ex ante, it is unclear which effect dominates if an anchor or key tenant departs from a retail center, since this also affords the landlord with a growth option: the opportunity to adjust rents to market. If a landlord is able to lease a space to an equivalent tenant survivor or to a higher-quality anchor through competition, then the landlord should experience a positive stock market reaction. By 'higher quality,' we mean that the key tenant generates more traffic and hence greater drawing power for the retail center and has an equivalent or higher tenant credit rating. On the other hand, a landlord's common stock should decline if the market perceives that the landlord is either unable to re-lease the space or the replacement anchor is of inferior quality due to an industry contagion effect. To examine abnormal returns on REIT common stocks, we utilize prior- and post-press release date data on public companies that have experienced major tenant bankruptcies, as well as major private store closures.[1]

We use an event study approach to investigate the impact of a major tenant's Chapter 11 bankruptcy filing on a landlord by observing the movements of the landlord's stock.[2] In aggregate, we find significant negative abnormal returns that are robust across various model specifications using a sample of 157 tenant bankruptcy events from 2000 to 2010 in the U.S. We also find a substantial increase in the risk associated with and variations in landlord stock prices, which confirms the practitioners' wisdom that Chapter 11 bankruptcy filings create a significant amount of uncertainty for landlords regarding store closures under tenant reorganization. Cross-sectional analyses reveal that the local economic base of a landlord's market plays an important role in determining whether the growth option exists. A multivariate OLS regression shows that such abnormal returns are positively associated with broad industry diversification of a local economic base, and negatively associated with the anchor tenant dummy, conditional on the level of tenant exposure.

The Tenant-Landlord Feedback Effects

To study the impact of major tenant bankruptcies on the stock performance of their former landlords, we identify the following feedback effects.

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 the landlord's stock price, as evidenced in the following news examples:

- Developers Diversified Realty Corp., Kimco Realty Corp., and 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, November 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, January 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, March 21, 2002.*

The magnitude of a landlord's stock market response may vary depending on the severity of the exposure represented by a troubled tenant. A landlord with greater tenant exposure (i.e., a higher percentage of revenue generated from the bankrupted tenant) will experience a stronger response. A landlord with a more diversified set of tenants will tend to be more resilient to shocks caused by the loss of any particular tenant.

The Growth Option with Tenant Competitive Effects

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, they also tend to pay a lower percentage of their sales in rent (Wheaton, 2000).

Furthermore, store closures may benefit landlords. If a tenant bankruptcy is a consequence of industry competition, wealth will be re-distributed within the industry, with little loss of total industry market value. The landlord should be indifferent to or even welcome the prospect of signing new leases with rival firms who win the competition and expand their market shares. Despite numerous big-box store closings and chain liquidations, stronger retailers have been re-leasing vacated locations as second-generation space. Retail landlords may take this opportunity to replace below-market rents contracted several years earlier with new tenants who are in an expansion mode.

For example, prior to 2009, Indianapolis-based HHGregg was a regional electronics chain that few shoppers outside of the Midwest had heard of. 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 opened more than 30 stores over an 18-month period, and planned to open 45 more in 2011. The majority of these new locations formerly housed Circuit City, the failed electronics giant. Other tenants that have actively signed leases recently include Kohl's, Dollar Tree, Buybuy Baby, Express, and Giant.

The termination of old leases not only provides a landlord with an opportunity to mark rents to market, but it also provides some flexibility by keeping the growth option alive, as evidenced below.

> At neighborhood and community center REITs, strong leasing velocity at its centers resulted in a 30 bps increase in occupancy to 94.5% over the 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. REIT 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, November 12, 2008.*

It is worth noting that exercising the growth option is rather complicated. Retailers selectively target the best available locations. This suggests that stores in an expansion mode will locate in areas that have 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 capitalize on the opportunity to upgrade by increasing their store size in high-quality malls that offer either high sales per square foot or a high traffic count. However, bankrupt tenants under a Chapter 11 reorganization plan will try to keep the more profitable stores open. These open stores are likely located in better locations or have lower rents.

Contagion and the Anchor Tenant Amplification Effect

For most retail landlords, a particular tenant may account for only a small portion of the total revenue that they receive from other performing tenants. The direct revenue loss from such a bankrupt tenant is thus limited for a well-diversified landlord. However, store closures and tenant liquidations affect landlords in a meaningful way due to non-contractual contagion effects and contractual tenant

dependency provisions such as co-tenancy and kick-out clauses. The contagion effect is the sum of adverse consequences when one tenant's action spreads throughout the industry, which implies a positive default correlation.[3]

Extensive evidence exists of the intra-industry contagion effect of Chapter 11 bankruptcies on the stock market (Lang and Stulz, 1992; Slovin, Sushka, and Polonchek, 1997; and Hertzel, Li, Officer, and Rodgers, 2008). 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 occurred 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 an 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 (Jarrow and Yu, 2001); and (3) updating of beliefs occurs 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).

Generally, a "contagion effect" implies positive default correlations. A more relevant example in the retail industry is that of video rental stores. Immediately following reports that bankrupt retailer Movie Gallery (which also owns Hollywood Video) planned to liquidate its remaining 2,000-plus stores in early May 2010, shopping center landlords put the entire video rental segment on their watchlists. Blockbuster (another video rental store) then filed for Chapter 11 bankruptcy on September 23, 2010.

The failure of an anchor tenant may have an amplifying or domino effect due to the exercise of contingent provisions in the retail lease contracts such as co-tenancy and kick-out clauses. Having long been a part of modern shopping center development and retail leasing strategies, a co-tenancy clause allows tenants to demand reductions in rent or a penalty-free pullout if key tenants or a specified number of stores (based on an occupancy threshold) leave a retail center. The rationale supporting a tenant request is simple enough: 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 their visibility and sales.[4]

The risk created by the domino effect of lease terminations or reduced rent that might arise from an anchor tenant departure can be catastrophic. This ripple effect is especially troubling in turbulent times when it is hard to re-lease a space to other tenants (Rosenfeldt, 2009). Using shopping center data from Florida and Georgia, Gatzlaff, Sirmans, and Diskin (1994) estimate that the loss of an anchor tenant results in a 27% rent rate decline for the remaining tenants. The bankruptcy of an anchor tenant may thus trigger a chain reaction of lease terminations or rent reductions among smaller retailers and lead to a collectively larger revenue loss to the landlord.

The Data and Descriptive Analysis

The data used in this study, some of which are hand-collected, come from several sources. First we obtain a list of retail real estate companies from SNL. The REIT sector accounts for the majority of the retail real estate business. Another advantage of using REITs is that financial and tenant information on REITs is transparent. In Exhibit 1 we list all the retail REITs used in this study, including defunct firms. There are 73 firms, 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 the 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. A tenant is included in the top tenant list if the aggregate rents to be paid to the landlord company by the tenant as a percentage of the total rents are equal or greater than 0.20%. Tenant information includes contractual relations between landlord REIT firms and their tenants, number of leases, percentage of revenue, and percentage of square feet for each tenant.

We collect bankruptcy announcements from two sources. Public bankruptcy filings are obtained from the Bankruptcy Research Database at the UCLA law school. Private retailer bankruptcy data are hand-collected from various industry reports: J.P. Morgan, Morgan Stanley, Deutsche Bank, Colliers International, CoStar, International Shopping Center Council, ULI, etc.

The public bankruptcy 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. A total of 907 major public firms filed for Chapter 11 reorganization between 1980 and 2010. Exhibit 2 shows time variations in bankruptcy filings by industry. We select Chapter 11 bankruptcy cases according to the following rules: (1) The bankruptcy was filed after 1999, because REIT tenant exposure information is not available prior to 2000; and (2) the tenant leased real estate space from at least one REIT landlord before filing under Chapter 11. Exhibit 3 demonstrates the total number of bankruptcy filings across industries and across years in the sample.

The total numbers of private defunct retailers vary by industry sector (Exhibit 4) and those of defunct department stores vary by state (Exhibit 5). From the 681 defunct retailers in the U.S. who have closed their doors since 1950, we match 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. The final sample contains 157 tenant-landlord matches with tenant bankruptcy announcements.

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

Exhibit 1 | List of Retail REITs

Company Name	Ticker	Current	Property Focus	IPO Date	Assets as of 2010:Q3 (in $1000s)
Panel A: List of current retail REITs					
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

Exhibit 1 | (continued)
List of Retail REITs

Company Name	Ticker	Current	Property Focus	IPO Date	Assets as of 2010:Q3 (in $1000s)
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 defunct retail REITs

Company Name	Ticker	Current	Property Focus	IPO Date	Defunct Date
Arbor Property Trust	ABR	No	Regional Mall	2/28/1994	12/18/1997
Crown American Realty Trust	CWN	No	Regional Mall	8/9/1993	11/20/2003
DeBartolo Realty Corporation	N/A	No	Regional Mall	4/14/1994	8/9/1996
EQK Realty Investors I	N/A	No	Regional Mall	3/12/1985	8/29/2000

Exhibit 1 | (continued)
List of Retail REITs

Company Name	Ticker	Current	Property Focus	IPO Date	Defunct Date
JP Realty, Inc.	JPR	No	Regional Mall	1/13/1994	7/10/2002
Mills Corporation	MLS	No	Regional Mall	4/21/1994	4/2/2007
Rouse Company	ROUS	No	Regional Mall	1/15/1957	11/12/2004
Urban Shopping Centers, Inc.	URB	No	Regional Mall	10/14/1993	11/7/2000
Chelsea Property Group, Inc.	CCG	No	Outlet Center	10/26/1993	10/14/2004
Horizon Group Properties, Inc.	HGPI	No	Outlet Center	11/8/1993	12/10/2003
McArthur/Glen Realty Corp.	N/A	No	Outlet Center	10/21/1993	7/17/1995
Prime Retail, Inc.	PRME	No	Outlet Center	3/15/1994	9/26/2001
JDN Realty Corporation	JDN	No	Power Center	3/29/1994	3/13/2003
Price REIT, Inc.	N/A	No	Power Center	12/3/1991	6/22/1998
Aegis Realty, Inc.	AER	No	Shopping Center	10/10/1997	3/26/2003
AmREIT	AMY	No	Shopping Center	7/23/2002	12/19/2008
Atlantic Realty Trust	ATLRS	No	Shopping Center	5/14/1996	3/31/2006
Bradley Real Estate, Inc.	BRLY	No	Shopping Center	1/27/1961	9/18/2000
Burnham Pacific Properties, Inc.	BPAC	No	Shopping Center	1/15/1987	6/27/2002
Center Trust, Inc.	ACH	No	Shopping Center	12/27/1993	1/17/2003
Excel Realty Trust, Inc.	N/A	No	Shopping Center	8/4/1993	9/29/1998
First Washington Realty Trust, Inc.	FRW	No	Shopping Center	6/27/1995	2/28/2001
Heritage Property Investment Trust	HTG	No	Shopping Center	4/23/2002	10/5/2006

Exhibit 1 | (continued)
List of Retail REITs

Company Name	Ticker	Current	Property Focus	IPO Date	Defunct Date
IRT Property Company	IRT	No	Shopping Center	4/29/1971	2/12/2003
Konover Property Trust, Inc.	FAC	No	Shopping Center	6/3/1993	11/22/2002
Kramont Realty Trust	KRT	No	Shopping Center	12/29/1988	4/18/2005
Kranzco Realty Trust	KRT	No	Shopping Center	11/12/1992	6/16/2000
Malan Realty Investors, Inc.	MAL	No	Shopping Center	6/16/1994	8/27/2004
Mid-America Realty Investments, Inc.	N/A	No	Shopping Center	12/30/1986	8/6/1998
Mid-Atlantic Realty Trust	BTRI	No	Shopping Center	9/11/1993	10/1/2003
MSA Realty Corporation	N/A	No	Shopping Center	3/29/1984	9/8/1994
New Plan Excel Realty Trust, Inc.	NXL	No	Shopping Center	7/1/1962	4/20/2007
Pan Pacific Retail Properties, Inc.	PNP	No	Shopping Center	8/7/1997	10/30/2006
Philips International Realty	PHR	No	Shopping Center	5/7/1998	10/22/2002
Price Legacy Corporation	PLRE	No	Shopping Center	12/21/1994	12/21/2004
Tucker Properties Corporation	N/A	No	Shopping Center	10/5/1993	3/18/1996
United Investors Realty Trust	UIRT	No	Shopping Center	3/10/1998	9/21/2001
USP Real Estate Investment Trust	URT	No	Shopping Center	4/25/1978	6/15/2000
Western Properties Trust	WIR	No	Shopping Center	6/13/1984	11/13/2000
Westfield America, Inc.	WEA	No	Shopping Center	5/15/1997	10/1/2001

Notes: Exhibit 1 lists all REITs with property focus on the retail real estate sector, including regional malls, shopping centers, outlets, and other retail properties. Panel A lists all current REITs as of the year end of 2010. Panel B lists all defunct REITs. Information on IPO date and total assets (in thousands) as of 2010:Q3 are from SNL.

Exhibit 2 | Chapter 11 Bankruptcy Filing Distribution by Year: 1980–2010

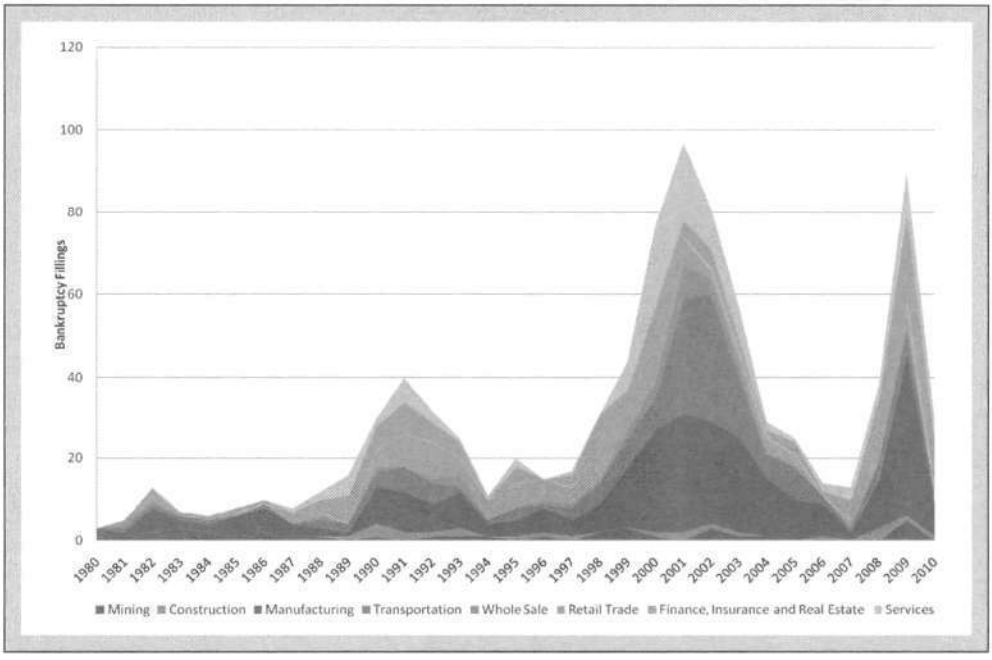


Exhibit 2 presents historical Chapter 11 bankruptcy cases in the U.S. filed during 1980–2010. The data are from a bankruptcy research database (BRD) compiled by Lynn LoPucki at UCLA. The BRD contains all Chapter 11 bankruptcy cases filed by companies that (1) have assets worth $100 million or more at the time of filing, measured in 1980 dollars, and (2) are required to file 10-Ks with the SEC. The total number of bankruptcy filings is further decomposed by industry: Mining, Construction, Manufacturing, Transportation, Communications and Utilities, Whole sale, Retail Trade, Finance, Insurance and Real Estate, and Services.

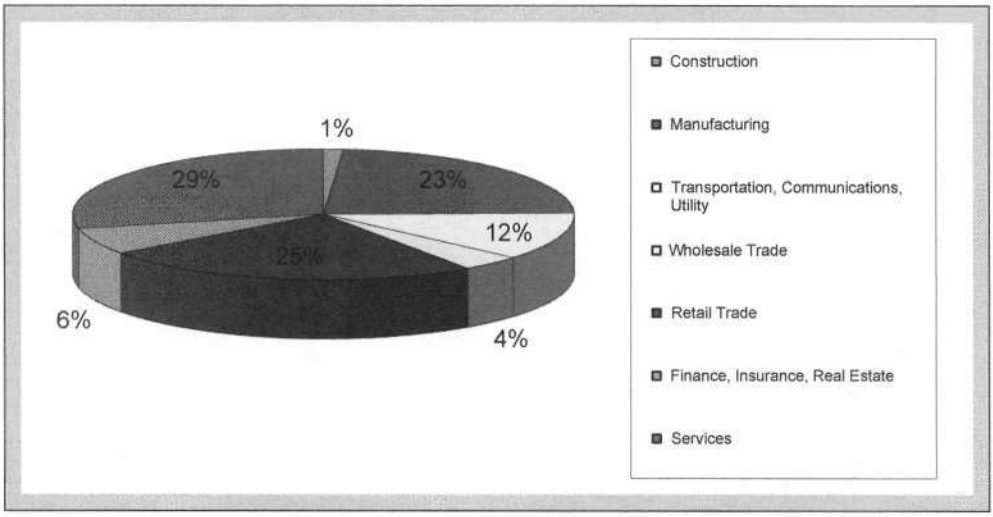
day +30. The impact of a major tenant bankruptcy announcement on a REIT's stock price is estimated using abnormal performance over the event window. We define the following timing sequence: event date, $t = 0$, as the date of the tenant bankruptcy filing; the event window as $T_1 + 1$ to T_2; and the pre-bankruptcy estimation window as T_{0+1} to T_1. The timing sequence is illustrated on the time line in Exhibit 6. We interpret abnormal returns and volatilities over the event window as measures of the impact of a tenant bankruptcy event on the value of the REIT.

Measurement of Abnormal Performance

We present two types of evidence on abnormal returns following a tenant bankruptcy event. First, we calculate cumulative abnormal returns (CARs) after bankruptcy using several time horizons (Campbell, Lo, and Mackinlay, 1997; and Brown and Warner, 1980). Second, we present results using buy-and-hold returns (BHARs), as this is a better method for calculating long-run abnormal returns, reflecting the compounding of long-run returns (Barber and Lyon, 1997).

Exhibit 3 | Chapter 11 Bankruptcy Filings by REITs' Public Tenants: 1999–2010

Panel A: Public Tenant Bankruptcy by Industry



Panel B: Public Tenant Bankruptcy by Year

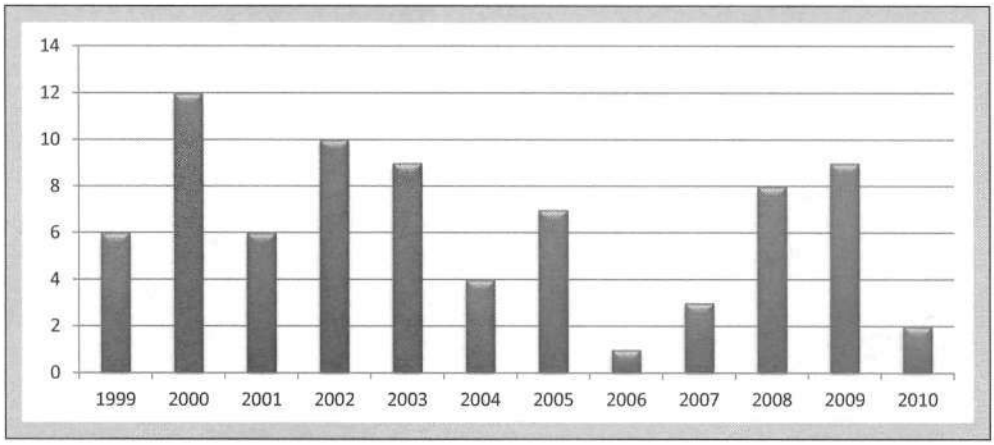


Exhibit 3 presents the total number of bankruptcy cases filed by public tenants of REITs from 1999 to 2010. Panel A is percentage of Chapter 11 filings by industry. Panel B is total number of bankruptcy filings by year.

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 abnormal return as the difference between the realized return on security i in period t and the mean return on the same security over the normal performance period (Brown and Warner, 1980, 1985); and (2) the market model, which we

Exhibit 4 | Private Defunct Retailers in the U.S. by Industry: 1950–2010

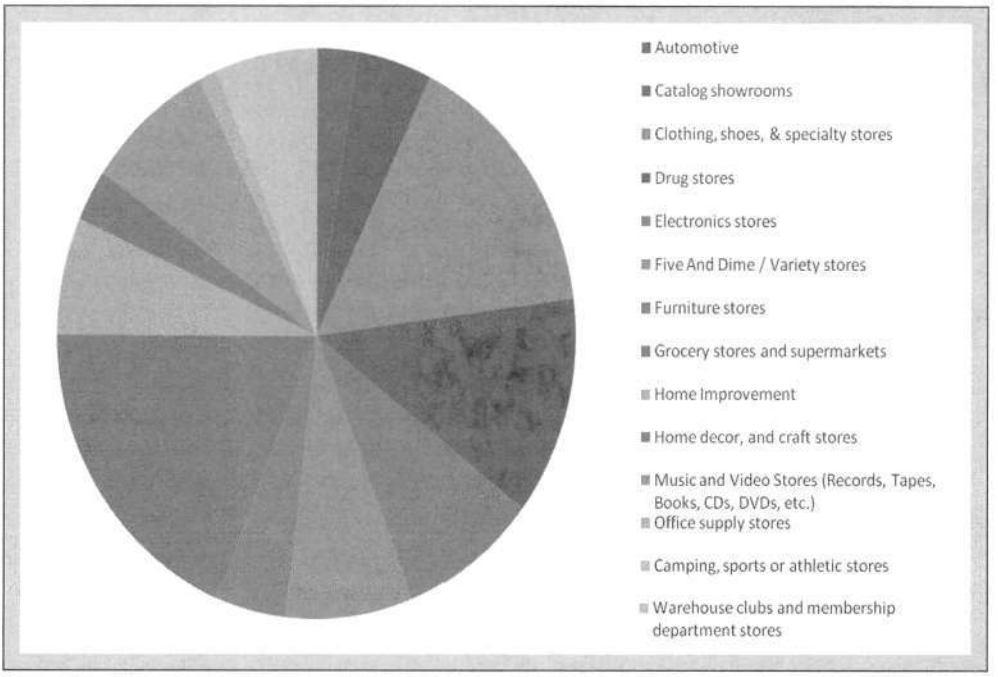


Exhibit 4 indicates shares of private defunct retailers in the United States by industry. Across the U.S. a large number of local stores and retail chains became defunct during the 1950s, when modern shopping centers were introduced, and the 1980s, when many chains were either consolidated or liquidated. Some have been lost due to mergers.

describe in detail below. We present results for both the constant return model and the CAR model.

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 formula:

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

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 CAR on the BHAR is calculated as the return on a buy-and-hold investment in a firm less the return on a buy-and-hold investment in a portfolio with an appropriate expected return:

Exhibit 5 | Defunct Department Stores in the U.S. by State: 1950–2010

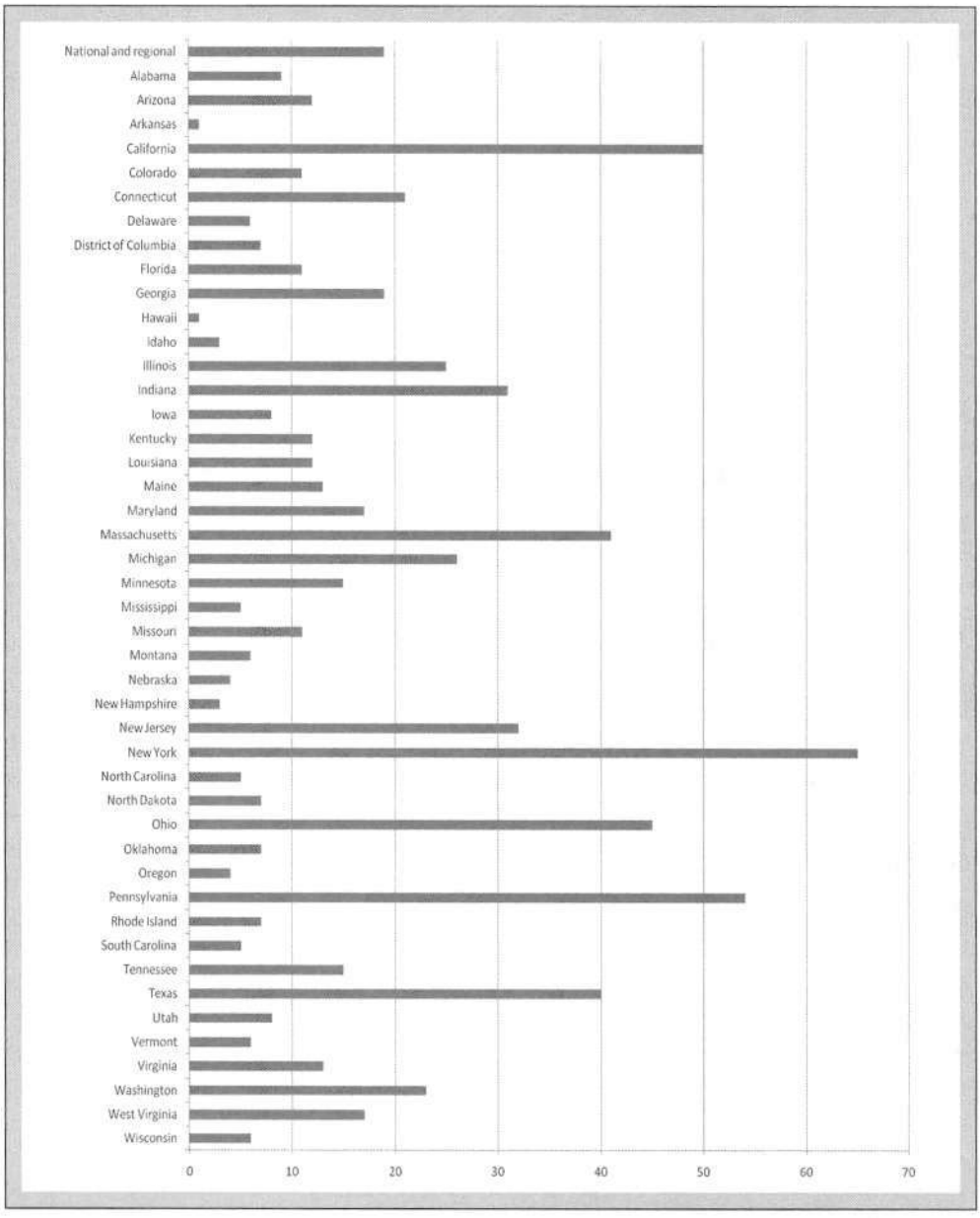
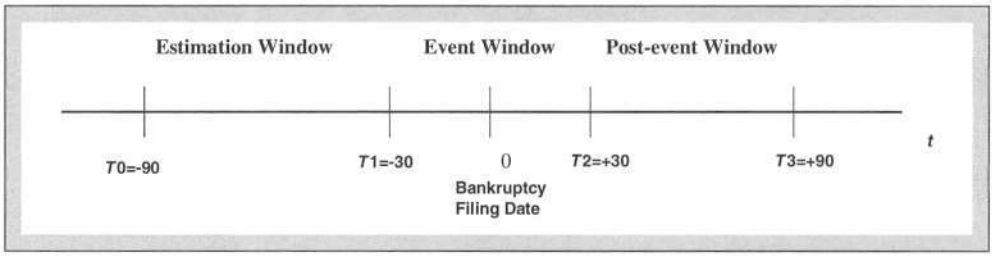


Exhibit 5 presents the number of defunct department stores in the U.S. The stores range from small-town one-unit stores to big city mega-chains that have disappeared over the past 100 years, including both traditional department stores and discount stores. This list excludes 86 department stores that involved with Federated and May. Many department stores went out of business or lost their identities between 1990 and 2005 as a result of a complex series of corporate mergers and acquisitions that were involved Federated Department Stores and The May Department Stores Company and that resulted in many stores becoming units of Macy's, Inc.

Exhibit 6 | Time Line for Bankruptcy Event Study



$$BHAR_{i\tau} = \prod_{t=1}^{\tau} [1 + R_{it}] - \prod_{t=1}^{\tau} [1 + E(R_{it})]. \quad (2)$$

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 the BHAR estimation.

Recent methodological studies disagree on the best method for calculating abnormal returns (e.g., Barber and Lyon, 1997). 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 Piotroski, 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 are, CARs will be greater than BHARs. Ritter (1991) was among the first to argue that CARs and BHARs can be used to answer different questions.

Cross-sectional Analysis of Abnormal Performance

In the results that follow, we employ multivariate regressions to explain cross-sectional variation in abnormal returns in post-bankruptcy periods. We are interested in what factors determine such cross-sectional variation in CARs. Liu, Liu, and Zhang (2010) provide the theory and evidence linking a REIT's value to its asset quality. They find that an asset's tenant quality and local economic base 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 is the percentage of a REIT's revenue that comes from a bankrupt tenant, the bigger the impact of tenant bankruptcy will be.

Another significant determinant of REIT value is industry diversification of a local economic base. In our analysis, we use an average industry diversification ratio of a REIT's top markets. Each local market is defined as a Metropolitan Statistical

Exhibit 7 | Average CARs under Constant Return Model and Market Model

	Constant Return Model		Market Model	
Trading 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

Exhibit 7 | (continued)

Average CARs under Constant Return Model and Market Model

	Constant Return Model		Market Model	
Trading Days	AR	CAR	AR	CAR
+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

Notes: Exhibit 7 presents the average percentage abnormal return (AR) and cumulative abnormal return (CAR; from −30 trading days before the event) for various trading-day windows. The constant return model uses the constant mean of the historical return as the normal performance for the security of interest. The market model uses the fitted value from a market model regression as normal performance.

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 people, 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 a list of the top ten MSAs that face exposure to the bankrupted tenants in each REIT. For each MSA we then calculate a Gibbs-Martin diversification index (GMI):[5]

Exhibit 8 | Average BHARs under Different Benchmark Indexes

	All REITs	Equity REITs	Retail REITs
−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

Exhibit 8 | (continued)

Average BHARs under Different Benchmark Indexes

	All REITs	Equity REITs	Retail REITs
+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

Notes: Exhibit 8 presents the percentage cumulative buy-and-hold abnormal return (BHAR; starting from −30 trading day before the event) for various trading day windows. The cumulative abnormal return (CAR) on the buy-and-hold strategy 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.

$$GMI = 1 - \frac{\sum_{i=1}^{N} E_i^2}{\left(\sum E_i\right)^2}, \tag{3}$$

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 markets with more diversified economic bases 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

Exhibit 9 | Average Abnormal Return Following a Tenant Bankruptcy

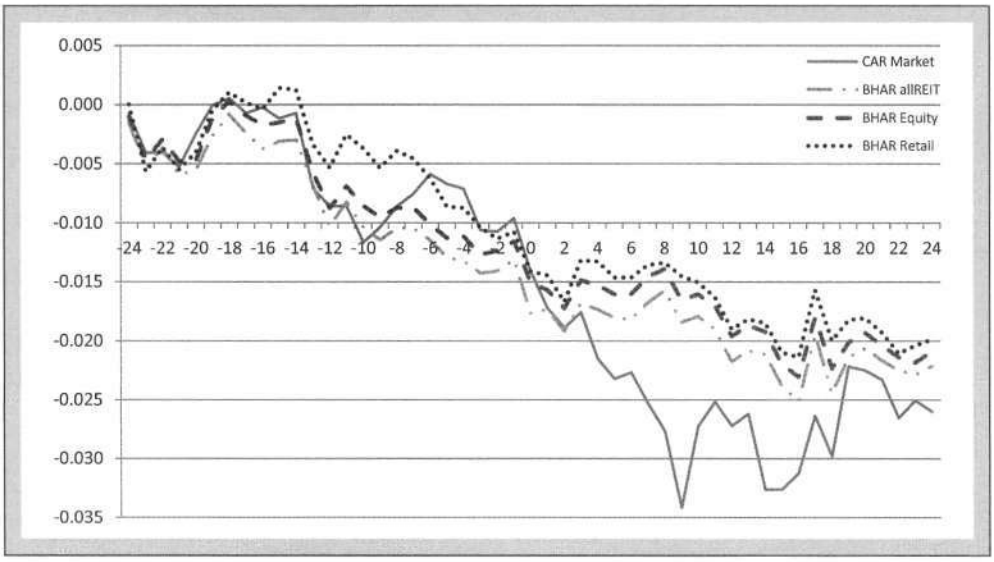


Exhibit 9 presents the abnormal returns averaged across the 160 observations following the Chapter 11 bankruptcy filing of a major tenant.

higher GMI index (higher diversification of the local industry mix) will experience a smaller negative effect (or even a positive effect) on their stock performance following a tenant bankruptcy event.

In summary, we run the following step-wise multivariate OLS regression:

$$AR_{it} = a + b_1(Exposure_{it}) + b_2(Size_{it}) + b_3(Market_{it}) + b_4(GMI_{it}) + b_5(Anchor_{it}) + b_6(Controls_{it}) + e_{it}, \quad (4)$$

where a and e_{it} are a constant and an error term, respectively; AR_{it} is the cumulative abnormal return (CARs and BHARs) for firm i over the window period; *Exposure* is the total percentage of tenant revenue contribution to its landlord at the time of tenant bankruptcy; *Size* is the natural logarithm of the average square feet of each REIT's shopping centers; *Market* is the market return computed as the total return on the value-weighted REIT/Ziman Index; *GMI* is the Industry Diversification ratio computed as the average Gibbs-Martin Index from REIT major markets with bankrupted tenants; *Anchor* is the dummy variable that equals one if the bankrupted tenant is an anchor for more than half of the landlord's centers and zero otherwise.[6] We separately estimate CARs and BHARs for various post-event windows of interest, including day 0 to day +1, day 0 to day +2, day 0 to day +5, and day 0 to day +30.

Exhibit 10 | Stock Price Response to Tenant Bankruptcy

		CAR		BHAR		
Trading Days	*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

Notes: Mean estimates of CARs and BHARs, their *t*-statistics (in the row 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 filing. 0 to +1 is two-day returns after the event, while 0 to +4 is 5-day cumulative return. CARs are estimated using both the market model and the constant return model. BHARs are estimated with three REIT indexes as expected return: the All REIT Index from Ziman, the Equity REIT Index, and the Retail REIT Index.

*Significant at the 10% level.

**Significant at the 5% level.

***Significant at the 1% level.

Exhibit 11 | REIT Risk Dynamics Before and After Major Tenant Bankruptcy

	BHAR Return Volatility[a]			BHAR Return Volatility Dynamics[a]	
Trading Days	Volatility	Range	Trading Days	Volatility	Range
−90 to −60	0.065	(0.016, 0.495)	−90 to −30	0.048	(0.012, 0.360)
−60 to −30	0.067	(0.016, 0.530)			
−30 to 0	0.069	(0.015, 0.329)	−30 to +30	0.050	(0.012, 0.252)
0 to +30	0.070	(0.014, 0.401)			
	BHAR Return Volatility Dynamics[b]			BHAR Return Volatility Dynamics[b]	
Trading Days	Volatility	Range	Trading Days	Volatility	Range
−90 to −60	0.065	(0.016, 0.495)	−90 to −30	0.048	(0.012, 0.358)
−60 to −30	0.066	(0.016, 0.526)			
−30 to 0	0.068	(0.015, 0.323)	−30 to +30	0.050	(0.012, 0.251)
0 to +30	0.069	(0.014, 0.398)			
	BHAR Return Volatility Dynamics[c]			BHAR Return Volatility Dynamics[c]	
Trading Days	Volatility	Range	Trading Days	Volatility	Range
−90 to −60	0.065	(0.014, 0.484)	−90 to −30	0.048	(0.011, 0.353)
−60 to −30	0.068	(0.014, 0.526)			
−30 to 0	0.070	(0.015, 0.313)	−30 to +30	0.050	(0.010, 0.240)
0 to +30	0.070	(0.013, 0.381)			

Notes: Exhibit 11 reports a risk measure of REIT stock abnormal return before and after a bankruptcy event involving the REIT's major tenants. The risk dynamics is measured as the annualized standard deviation of BHAR for various windows.

[a]Benchmark to all REITs.

[b]Benchmark to equity REITs.

[c]Benchmark to retail REITs.

Empirical Results

Exhibit 7 presents the average percentage of ARs and CARs (starting from trading day −30, 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 to indicate normal performance. Exhibit 8 presents the percentage of

Exhibit 12 | Summary Statistics and Correlation Matrix

Panel A: Summary statistics

Variable	Mean	Std. Dev.	Min.	Max.
CAR	−0.008	0.034	−0.281	0.098
BHAR	−0.007	0.032	−0.259	0.150
Size (average s.f. in logs)	11.445	1.258	7.290	15.847
Exposure (%)	4.235	7.663	0	60
Market	−0.007	0.031	−0.087	0.093
GMI	0.909	0.006	0.894	0.919

Panel B: Pearson correlation matrix

Variable	CAR	BHAR	Size	Exposure	Market	GMI
CAR	1					
BHAR	0.943	1				
Size (average s.f. in logs)	0.090	0.082	1			
Exposure (%)	−0.063	−0.082	0.038	1		
Market	0.379	0.293	0.248	0.053	1	
GMI	0.217	0.189	0.122	0.089	0.161	1

Notes: Exhibit 12 reports summary statistics and Pearson correlations of variables used in the cross-sectional regressions. CAR and BHAR are two-day CARs calculated via the market model and the buy-and-hold strategy, respectively. Size is the natural logarithm of average square feet of each of a REIT's shopping centers. Exposure is the total percentage of tenant revenue contribution to a landlord at the time of tenant bankruptcy. Market is the market return of a value-weighted REIT market index. GMI is the Industry Diversification ratio computed as the average Gibbs-Martin Index from REIT major markets with bankrupted tenants. The number of observations is 157.

cumulative BHARs (starting from trading day −30, before the event) for various trading day windows. The CAR from the BHAR is calculated by subtracting the return on a buy-and-hold investment in a sample firm from the return on a buy-and-hold investment in a portfolio with an appropriate CRSP/Ziman Index.

Exhibit 9 displays a visual representation of the CARs. Even though CARs and BHARs are both negative and decreasing before the bankruptcy event window, the negative landlord stock price responses during the event days are highly significant. Consistent with past event studies, the two-day event window contains the most significant CAR.

Key statistics on the CARs and BHARs are shown in Exhibit 10 for various post-event windows following a tenant bankruptcy, with the event date as the date of

Exhibit 13 | Cross-sectional Analysis of Abnormal Performance of Landlord Stocks following a Tenant Bankruptcy (2000–2010)

	1	2	3	4	5
Panel A: Two-Day CAR					
Constant	−0.003	−0.925**	−1.141***	−1.130***	−0.843**
	(0.025)	(0.408)	(0.347)	(0.333)	(0.355)
Exposure	−3.7E-04	−4.3E-04	−4.4E-04	−4.2E-04	−4.7E-04*
	(3.4E-04)	(3.3E-04)	(2.8E-04)	(2.7E-04)	(2.8E-04)
Size	−4.5E-05	−4.5E-04	−0.002	5.7E-05	−0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Market	0.426***	0.401***	0.513***	0.256**	30.287***
	(0.086)	(0.085)	(0.073)	(0.099)	(10.523)
GMI		1.019**	1.290***	1.254***	0.968**
		(0.451)	(0.383)	(0.368)	(0.391)
Anchor			−0.035***	−0.031***	−0.034***
			(0.004)	(0.004)	(0.004)
Market x Anchor				0.516***	
				(0.140)	
Market × GMI					−32.758***
					(11.577)
Adj. R^2	0.150	0.178	0.316	0.364	0.345
Panel B: Two-Day BHAR					
Constant	−0.007	−0.787**	−1.009***	−1.001***	−0.761**
	(0.024)	(0.392)	(0.323)	(0.314)	(0.332)
Exposure	−4.1E-04	−4.6E-04	−4.6E-04*	−4.5E-04*	−4.9E-04*
	(3.2E-04)	(3.2E-04)	(2.6E-04)	(2.6E-04)	(2.6E-04)
Size	3.2E-04	−1.8E-05	−0.001	1.1E-04	−0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Market	0.304***	0.282***	0.398***	0.199**	25.200**
	(0.082)	(0.082)	(0.068)	(0.094)	(9.857)
GMI		0.862**	1.141***	1.113***	0.872**
		(0.433)	(0.357)	(0.347)	(0.366)
Anchor			−0.036***	−0.033***	−0.036***
			(0.004)	(0.004)	(0.004)
Market × Anchor				0.400***	
				(0.132)	
Market × GMI					−27.287**
					(10.844)
Adj. R^2	0.095	0.118	0.311	0.345	0.334

Exhibit 13 | (continued)

Cross-sectional Analysis of Abnormal Performance of Landlord Stocks following a Tenant Bankruptcy (2000–2010)

Notes: Exhibit 13 presents the multivariate OLS regression results from a cross-sectional analysis of REIT abnormal returns using a sample of 157 observations from 2000 to 2010. The dependent variables are REIT two-day CARs following a tenant bankruptcy. The dependent variable in Panel A is computed via the CAR market model, while the dependent variable in Panel B is computed via its BHAR model with the All REIT Index as the benchmark. The regression equation is CAR = constant + $b_1(Exposure)$ + $b_2(Size)$ + $b_3(Market)$ + $b_4(GMI)$ + $b_5(Anchor)$ + $b_6(Controls)$ + e. Exposure is the total percentage of tenant revenue contribution to a landlord at the time of tenant bankruptcy. Size is the natural logarithm of the average square feet of each of a REIT's shopping centers. Market is the market return on the value-weighted REIT market index. GMI is the Industry Diversification ratio computed as the average Gibbs-Martin Index from major REIT markets with bankrupted tenants. Anchor is a dummy variable, which equals one if a bankrupt tenant is an anchor tenant for more than half of its landlord's centers and zero otherwise. Heteroscedasticity-consistent standard errors are shown in the row below the coefficient.

*Significant at the 10% level.

**Significant at the 5% level.

***Significant at the 1% level.

the bankruptcy filing. We define a two-day return and a five-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 REITs, Equity REITs, and Retail REITs) from Ziman to estimate BHARs. The null hypotheses of no abnormal returns at the post-event windows are strongly rejected across all model specifications. Furthermore, the abnormal return is more negative (more than 25%) using all REIT stocks as the benchmark than it is when using retail REITs as the benchmark. This result shows that a tenant bankruptcy affects not only its landlords but the entire retail REIT sector. In contrast to previous event studies, which use pre-event variance estimation to form a *t*-statistic, we utilize the post-event variance estimation to calculate *t*-statistics. As bankruptcy events create greater 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.

Exhibit 11 reports a risk measure of a REIT's abnormal returns before and after a bankruptcy event for (a) major tenant(s). The risk dynamics are measured as the annualized volatility (or standard deviation) of the 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 what it is in the pre-bankruptcy window. For example, the volatility for the −90 to −60 day (pre-bankruptcy) window is 0.065, which increases to 0.070 for the 0 to +30 day (post-bankruptcy) window.

Exhibit 14 | Cross-sectional Analysis of Abnormal Performance of Landlord Stocks Following a Tenant Bankruptcy (2000–2006)

	1	2	3	4	5
Panel A: Two-Day CAR					
Constant	0.001	−0.617***	−0.749***	−0.749***	−0.751***
	(0.013)	(0.219)	(0.148)	(0.148)	(0.150)
Exposure	−4.9E-04***	−0.001***	−4.9E-04***	−4.9E-04***	−4.9E-04***
	(1.5E-04)	(1.5E-04)	(9.9E-05)	(1.0E-04)	(9.9E-05)
Size	−7.8E-05	−3.7E-04	−0.002**	−0.002**	−0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Market	−0.019	−0.047	0.251***	0.251*	−1.052
	(0.136)	(0.132)	(0.093)	(0.137)	(14.531)
GMI		0.683***	0.856***	0.856***	0.858***
		(0.242)	(0.163)	(0.164)	(0.166)
Anchor			−0.021***	−0.021***	−0.021***
			(0.002)	(0.002)	(0.002)
Market × *Anchor*				−0.001	
				(0.200)	
Market × *GMI*					1.431
					(15.973)
Adj. R^2	0.097	0.165	0.428	0.428	0.428
Panel B: Two-Day BHAR					
Constant	−0.004	−0.674***	−0.808***	−0.808***	−0.804***
	(0.012)	(0.207)	(0.126)	(0.126)	(0.128)
Exposure	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***
	(1.4E-04)	(1.4E-04)	(8.4E-05)	(8.4E-05)	(8.5E-05)
Size	2.9E-04	−2.5E-05	−0.001**	−0.002**	−0.001**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Market	−0.138	−0.168	0.131	0.233**	3.584
	(0.130)	(0.124)	(0.079)	(0.116)	(12.397)
GMI		0.741***	0.915***	0.919***	0.910***
		(0.228)	(0.139)	(0.139)	(0.141)
Anchor			−0.021***	−0.021***	−0.021***
			(0.002)	(0.002)	(0.002)
Market × *Anchor*				−0.204	
				(0.170)	
Market × *GMI*					−3.796
					(13.627)
Adj. R^2	0.118	0.204	0.509	0.513	0.509

Exhibit 14 | (continued)

Cross-sectional Analysis of Abnormal Performance of Landlord Stocks Following a Tenant Bankruptcy (2000–2006)

This table presents the multivariate OLS regression results from a cross-sectional analysis of REIT abnormal returns using a sample of 102 observations from 2000 to 2006. The dependent variables are REIT two-day cumulative abnormal returns (CARs) following a tenant bankruptcy. The dependent variable in Panel A is computed via the CAR market model, while the dependent variable in Panel B is computed via its BHAR model with the All REIT Index as the benchmark. The regression equation is CAR = constant + b_1(*Exposure*) + b_2(*Size*) + b_3(*Market*) + b_4(*GMI*) + b_5(*Anchor*) + b_6(*Controls*) + e. Exposure is the total percentage of tenant revenue contribution to a landlord at the time of tenant bankruptcy. Size is the natural logarithm of the average square feet of each of a REIT's shopping centers. Market is the market return on the value-weighted REIT market index. GMI is the Industry Diversification ratio computed as the average Gibbs-Martin Index from major REIT markets with bankrupted tenants. *Anchor* is a dummy variable, which equals one if a bankrupt tenant is an anchor tenant for more than half of its landlord's centers and zero otherwise. Heteroscedasticity-consistent standard errors are shown in the row below the coefficient.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

To investigate cross-sectional differences in the abnormal returns in the post-event window, we run a multivariate OLS regression, following equation 4. Exhibit 12 provides the sample summary statistics and Pearson correlation matrix for the control variables. Exhibit 13 reports the regression results for CAR two-day returns using the market model (Panel A) and the BHAR two-day return using all REITs as the benchmark index (Panel B) with three step-wise regression models and two interactive-term regression models. Two panels of Exhibit 14 demonstrate similar results regarding the determinants of cross-sectional variations in post-event abnormal returns. First, conditional on the revenue exposure of a bankrupted tenant and the average retail property size of the owner, post-event abnormal returns are positively associated with market returns (*Market*). In a good economy (in which market returns are high), a tenant bankruptcy has a less negative or more positive effect on a landlord firm's stock returns. This result is consistent with the growth option hypothesis, according to which landlord REITs may lease vacant spaces at market rents or select new tenants that are in growth mode whose profits will be shared by the landlord via overage rents. Second, industry diversification (GMI) is positively associated with post-event abnormal returns. Landlords whose properties are located in markets with highly diversified economic bases will be more likely to exercise the growth option after a tenant vacates a space and thereby experience higher stock returns. Third, if the bankrupted tenant is an anchor tenant, the landlord REIT's stock returns are more negative. Because the bankruptcy of an anchor tenant will likely trigger a series

Exhibit 15 | Cross-sectional Analysis of Abnormal Performance of Landlord Stocks following a Tenant Bankruptcy (2007–2010)

	1	2	3	4	5
Panel A: Two-Day CAR					
Constant	0.027	−1.590	−2.020**	−2.035**	−1.243
	(0.094)	(1.123)	(0.932)	(0.907)	(1.020)
Exposure	−0.001	−0.003	−0.004	−0.004	−0.005
	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)
Size	−0.003	−0.005	−1.1E-04	0.002	−0.003
	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)
Market	0.443***	0.401**	0.503***	0.242	33.591*
	(0.157)	(0.158)	(0.132)	(0.187)	(19.292)
GMI		1.805	2.258**	2.242**	1.439
		(1.249)	(1.036)	(1.009)	(1.123)
Anchor			−0.059***	−0.050***	−0.059***
			(0.012)	(0.013)	(0.012)
Market × *Anchor*				0.474*	
				(0.246)	
Market × *GMI*					−36.371*
					(21.205)
Adj. R^2	0.142	0.177	0.449	0.488	0.481
Panel B: Two-Day BHAR					
Constant	−0.001	−0.996	−1.451*	−1.460*	−0.790
	(0.090)	(1.092)	(0.865)	(0.858)	(0.952)
Exposure	0.001	−2.5E-04	−0.002	−0.002	−0.003
	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)
Size	−0.001	−0.002	0.003	0.005	0.001
	(0.008)	(0.008)	(0.006)	(0.006)	(0.006)
Market	0.328**	0.302**	0.410***	0.238	28.571
	(0.151)	(0.153)	(0.123)	(0.177)	(17.999)
GMI		1.111	1.590*	1.579	0.893
		(1.215)	(0.962)	(0.954)	(1.047)
Anchor			−0.062***	−0.056***	−0.062***
			(0.011)	(0.012)	(0.011)
Market × *Anchor*				0.312	
				(0.233)	
Market × *GMI*					−30.955
					(19.785)
Adj. R^2	0.093	0.108	0.456	0.476	0.483

Exhibit 15 | (continued)

Cross-sectional Analysis of Abnormal Performance of Landlord Stocks following a Tenant Bankruptcy (2007–2010)

This table presents the multivariate OLS regression results from a cross-sectional analysis of REIT abnormal returns using a sample of 55 observations from 2007 to 2010. The dependent variables are REIT two-day CARs following a tenant bankruptcy. The dependent variable in Panel A is computed via the CAR market model, while the dependent variable in Panel B is computed via its BHAR model with the All REIT Index as the benchmark. The regression equation is $CAR = \text{constant} + b_1(Exposure) + b_2(Size) + b_3(Market) + b_4(GMI) + b_5(Anchor) + b_6(Controls) + e$. Exposure is the total percentage of tenant revenue contribution to a landlord at the time of tenant bankruptcy. Size is the natural logarithm of the average square feet of each of a REIT's shopping centers. Market is the market return on the value-weighted REIT market index. GMI is the Industry Diversification ratio computed as the average Gibbs-Martin Index from major REIT markets with bankrupted tenants. *Anchor* is a dummy variable, which equals one if a bankrupt tenant is an anchor tenant for more than half of its landlord's centers and zero otherwise. Heteroscedasticity-consistent standard errors are shown in the row below the coefficient.

*Significant at the 10% level.

**Significant at the 5% level.

***Significant at the 1% level.

of co-tenancy clause exercises by inline tenants, an anchor-tenant default will create a domino effect of tenant closures or rent-reduction negotiations and thus lead to deep negative stock price responses to the landlord firm. Model 4 adds an interaction term between *Market* and *Anchor* in the regression, which is significantly positively associated with REIT abnormal return. The departure of an anchor tenant from a center is good news if it is a hot market, because the owner is likely to exercise the growth option in such a market. Model 5 adds an interaction term between *Market* and *GMI*, which is significantly negatively associated with REIT abnormal returns. In a cold market (one with lower market return), owners are more likely to exercise the growth option if their properties are in higher-quality locations.

To check the robustness of our regression results on landlord cross-sectional abnormal returns following a tenant bankruptcy, we test whether the abnormal responses of a landlord's stock price to tenant bankruptcy differs between a public tenant and a private tenant. In an unreported regression result, in which we include a dummy variable indicating a public tenant, we find that the public dummy variable is insignificant. To test stock market responses in a hot market versus those in a cold market, we split the sample into two periods: 2000–2006 (Exhibit 14) and 2007–2010 (Exhibit 15). The results concerning the role of location quality (*GMI*) and *Anchor* tenant amplification effect reported from Exhibit 12 are preserved. In addition, we observe that, during a period of strong economic growth (before 2007), the REIT negative abnormal returns are more properly aligned with

their tenant exposure and less affected by the market returns. During a market recession, however (e.g., during 2007–2010), REIT returns are correlated with the market to a much greater degree.

Conclusions

We analyze the interdependence and resulting feedback effects for firms having economic linkages with one another. In particular, we focus on the risk and return performance of landlords in a retail real estate setting when a key tenant declares bankruptcy and leaves a center using an event study methodology. Retail REITs provide an ideal laboratory to test the landlord-tenant feedback effect since the contracting mechanism associated with retail leases includes several options such as percentage rents and co-tenancy provisions that are unique to retail property. Moreover, the landlord in a retail setting attempts to create an optimal tenant mix vis-à-vis aggregating tenants from various industries that rely on retail stores to market their products. Given the aggregation process, the performance of the landlord reflects the joint intra-industry effect of contagion and inter-industry competition for retail space.

Ex ante, we argue that the stock price performance of a landlord will depend on which feedback effect dominates given the departure of an anchor or key tenant from a retail center. The three feedback effects include the (1) direct effect from tenant revenue losses—losing rental revenue on the space that the retailer occupies; (2) contagion and the anchor tenant amplification effect arising in part from co-tenancy clauses and going dark provisions, as well as the adverse consequences when one tenant's action spreads across the industry, which implies a positive default correlation; and (3) the growth option with tenant competitive effects, which benefit the landlord if below market rents of the departing tenant can be adjusted upwards without sacrificing tenant quality.

In general, we find that there a negative abnormal return, along with increased volatility to the common stock of the landlord given the departure of a key tenant. When we investigate cross-sectional differences in abnormal returns, we find that post-event abnormal returns are positively associated with market returns conditional on the revenue exposure of a bankrupted tenant and the average size of a landlord's retail property. In a good economy wherein market returns are high, a tenant bankruptcy has a less negative or a more positive effect on a landlord firm's stock returns. This result is consistent with the growth option hypothesis. Intuitively, the landlord (the REIT) may lease vacant spaces at market rents or select new tenants that are in a growth mode thus sharing tenant profits via overage rents. Second, industry diversification (GMI) is positively associated with post-event abnormal returns. Landlords whose properties are located in markets with highly diversified economic bases are more likely to exercise the growth option after a tenant vacates a space thereby experiencing higher stock returns. Third, if the bankrupt tenant is an anchor tenant, the landlord REIT's stock returns are more negative since the bankruptcy of an anchor tenant will likely trigger a series of co-tenancy clause exercises by inline tenants. An anchor-tenant default can

create a domino effect of tenant closures or rent-reduction negotiations and thus lead to deep negative stock price responses to the landlord firm.

To test stock market responses in a hot market versus those in a cold market, we split the sample into a hot market period (2000–2006) and a cold market period (2007–2010). The results concerning the role of location quality (GMI) and anchor tenant amplification effect are similar to the base case. In addition, we observe that, during a period of strong economic growth (prior to 2007), the negative abnormal returns of retail REITs are more properly aligned with their tenant exposure and less affected by the market returns. During a market recession, however (e.g., during 2007–2010), REIT returns are correlated with the stock market to a much greater extent.

Endnotes

[1] A major tenant bankruptcy impacts all firms in the retail REIT sector. Therefore we use different REIT indexes as the benchmarks in measuring abnormal performance. We observe overall negative abnormal return following tenant bankruptcy, even when we benchmark it using a retail REIT index.

[2] We take the lease contract structure as given and do not focus on the determinants of rents in shopping centers. Examples of such studies include Benjamin, Boyle, and Sirmans (1990, 1992), Sirmans and Guidry (1993), Des Rosiers, Theriault, and Menetrier (2005), and Gould, Pashigian, and Prendergast (2007).

[3] See Moody's Investor Service (2004).

[4] See, for example, Collier International (2010).

[5] Applying the methodology of Gibbs and Martin (1962), Corgel and Gay (1987) study mortgage default probability across MSAs. The GMI equals one minus the Herfindahl-Hirschman Index (HHI).

[6] The definition of *Anchor* is ad hoc. However, the results remain the same once we use different definitions. Other tenanting strategies may also influence the shopping center performance. Yuo and Lizieri (2013) use the degree of departmentalization and spatial complexity to measure the tenant placement strategy. Anikeeff (1996) emphasizes the importance of tenant selection and tenant mix in predicting shopping center performances. Our sample does not contain such detailed information on tenant mix and property floor plans.

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Crocker Liu, Cornell University, Ithaca, NY 14853 or chl62@cornell.edu.

Peng Liu, Cornell University, Ithaca, NY 14853 or peng.liu@cornell.edu.