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Liquidity and Liquidation: Evidence from Real Estate Investment Trusts

DAVID T. BROWN*

ABSTRACT

This study provides evidence that highly leveraged owner-managed properties liquidated assets during the commercial real estate decline of the late 1980s, and that this provided buying opportunities for better capitalized buyers. The analysis documents significant financial distress costs for highly leveraged firms during an industry-wide downturn and shows that these costs are particularly large for owner-managed firms.

THIS PAPER EXAMINES THE EFFECTS of the large decline in commercial real estate values that occurred in the late 1980s and early 1990s because of (i) declines in occupancy rates in commercial properties as a result of overbuilding during the 1980s, and (ii) credit problems that limited the financing available for borrowers (see Fergus and Goodman (1994) and Peek and Rosengren (1994)). The analysis compares the effects of the decline in commercial real estate values on highly leveraged owner-managed properties and on less leveraged properties held by real estate management companies with access to public equity markets. The data on owner-managed properties are from mortgage Real Estate Investment Trusts (REITs), publicly traded entities that make commercial real estate loans largely to owner-managed property managers or developers, and the loan-to-value ratio on these loans is typically 80 percent or more. In contrast, equity REITs hold equity positions with much less financial leverage and the properties are managed by corporate property managers.

This paper provides a systematic analysis of the mortgage and equity REITs during the real estate downturn and yields three important findings. First, the book value of mortgage loans held by mortgage REITs declines significantly from the end of 1988 to the end of 1991, while the book value of real estate equity positions held by equity REITs increases. During this period, mortgage REITs are net sellers of highly leveraged assets and equity REITs are net purchasers. Second, in spite of the indications that the market for commercial real estate is very depressed, mortgage REITs seldom reorga-

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nize their nonperforming loans. The vast majority of nonperforming loans are foreclosed. Third, during the 1989 to 1990 period, the total mortgage REIT stock returns are more negative than the total equity REIT stock returns. A decline in the value of real estate, absent any costs of financial distress, should result in a smaller decline in the value of mortgage REIT stock given that mortgage REITs hold a more senior claim on real estate assets than equity REITs. The larger share price declines observed for mortgage REITs during the downturn period are consistent with financial distress costs borne by mortgage REITs, including fire sale liquidations being capitalized into mortgage REIT share prices. They are also consistent with buying opportunities being capitalized into equity REIT prices.

The data presented in this paper suggest that the decline in real estate values beginning in 1989 forced a systematic sale of real estate at distressed prices by lenders that obtained the properties in foreclosure, and that less leveraged firms purchased these assets. These findings are consistent with the Shleifer and Vishny (1992) model of asset liquidity and with evidence provided by Pulvino (1998) that financially distressed airlines receive lower prices than their solvent rivals when selling used narrow-body aircraft. The finding that mortgage REITs foreclose rather than reorganize their loans to financially distressed owner-managers supports the models of Brown (1997) and Diamond (1993) which show that owner-managed firms suffer from managerial moral hazard problems in financial distress that cannot be eliminated by a financial reorganization that benefits the borrower and lender. Thus, these models predict that lenders foreclose on loans to owner-managers and sell the asset even if asset prices are depressed.

The remainder of this paper is organized as follows. Section I discusses the anticipated effects of a decline in commercial real estate values. Section II describes the sample of REITs examined in this study, compares the investments made by equity and mortgage REITs from the beginning of 1989 to the end of 1991, and examines the extent to which mortgage REITs foreclose their loans versus reorganize their debt. Section III analyzes the total returns to equity and mortgage REITs during the real estate downturn. Section IV provides a summary and conclusion.

I. Predicted Effects of a Decline in Collateral Values

This section discusses the important differences between mortgage and equity REITs and the properties they finance, as well as the anticipated effects of a decline in collateral values on the different types of properties examined. Additionally, testable implications are provided.

A. Equity and Mortgage REITs

For a firm to qualify as a REIT the following four conditions must hold: it must distribute, in the form of dividends, at least 95 percent of its taxable income to shareholders; at least 75 percent of its gross income must come from

rents, mortgages, or gains from the sale of real property; it must have at least 100 shareholders; and no five shareholders can own more than 50 percent of the shares. Trusts that qualify as REITs avoid double taxation—that is, profits paid out as dividends are not taxed at the corporate level. Further, during the period examined in this study there are significant tax penalties for REITs that are net sellers of more than 30 percent of their assets in a given year.

A mortgage REIT is a portfolio of real estate loans, and an equity REIT is a portfolio of real estate equity positions. The mortgage and equity REITs examined here finance income-producing commercial real estate properties: apartments, office buildings, warehouses, and shopping centers. Mortgage REITs that hold only residential mortgages are not included in this analysis.

Mortgage REITs typically finance properties managed by property managers who provide the equity financing for the project. Four of the 24 commercial mortgage REITs examined in this study make loans to partnerships affiliated with a single property management company. In these cases, the property manager provides equity capital. There is significant outside equity provided as well. Very few mortgage REITs have a substantial proportion of full-time employees; instead, an external advisory company provides investment advice and is compensated based on the amount of assets held by the REIT and the cash flow performance of the loans above a benchmark.

Equity REITs either hire out or perform in-house both investment decisions and property management. Equity REITs may manage the property directly, but in most cases hire an advisory company to manage the property. In either case, the cash flows generated from the properties go to the equity REIT shareholders net of a property management fee based on both the amount of assets under management and a percentage of cash flows above a benchmark.

The loan-to-value ratio of the loans in a mortgage REIT portfolio are often 80 percent or more. The charters of all mortgage REITs in this sample restrict the maximum loan-to-value ratio to between 70 percent and 100 percent of assessed value. From discussions in annual reports and data actually reported, it appears that very few loans are made with lower loan-to-value ratios. The debt obligations of the average equity REIT examined in this study are approximately 35 percent of the book value of total assets immediately prior to the decline in real estate values. Since the equity REIT owns the properties, the leverage of the equity REIT is also the leverage of the property. Thus, mortgage REITs hold claims against more leveraged properties than equity REITs.

B. Effects of a Decline in Real Estate Values

Given the different financial and ownership structures of properties financed by mortgage and equity REITs, one would expect very different responses across the two types of properties resulting from a decline in property values and the resulting reduction in the owner's equity. The decline in owner's equity (1) reduces the owner's incentives to make cash investments in

existing properties or purchase other properties and (2) reduces the owner's incentives to provide effort to enhance the property's cash flows. Since mortgage REITs finance significantly more leveraged properties, it is expected that both of these debt overhang problems are much larger for mortgage REIT-financed properties during the downturn in asset values.

Mortgage REITs have strong incentives to foreclose rather than reorganize and improve the property manager's incentives to provide effort or invest in the property. The lender cannot exchange her debt claim for an equity claim and improve the owner-manager's effort incentives because such an exchange would still leave the original owner-manager without a meaningful stake in the property. In order to overcome the distortions associated with debt overhang, the lender must forgive the debt in order to recreate the owner-manager's equity position (see Brown (1997), Venkataraman (1996), and Diamond (1993)). Thus, it is very difficult for the lender to capture any of the gains associated with avoiding a foreclosure (i.e., retaining the existing property manager). Finally, the foreclosed properties are likely to be sold at depressed prices since the downturn in asset values results in a scarcity of well-capitalized owner-managers.

This logic suggests that since mortgage REITs finance highly leveraged, owner-managed properties, it is expected that they experience significant financial distress costs. Specifically, it is expected that (1) mortgage REITs have significant loan defaults and the associated declines in owner incentives, (2) mortgage REITs foreclose on, rather than reorganize, a large proportion of their distressed loans, and (3) these foreclosed properties are sold at depressed prices. In contrast, equity REITs are less leveraged, do not rely on owner-property management arrangements, and thus are less likely to be forced to sell assets by their lenders. Moreover, since mortgage REITs finance affiliated partnerships with significant outside equity, it is expected that mortgage REITs with affiliated partnerships are likely to be reorganized because the property manager's stake is not as critical.

Mortgage REITs liquidate properties at a discount given the limited gains from reorganizing the debt claim only if the mortgage REIT can neither manage the foreclosed property in-house nor hire an independent property manager to manage the property effectively. There are two reasons why a mortgage REIT does not hire an external manager. First, the mortgage REIT itself has debt outstanding and the mortgage REIT's senior lenders may very well prefer and be able to force a liquidation of nonperforming loans. This suggests that more leveraged mortgage REITs are more likely to sell the property underlying the defaulted loans than to manage the real estate.¹

¹ REIT level borrowings clearly affected the operations of some REITs. For example, Lomas & Nettleton Mortgage Investors announced in a December 12, 1989 *Wall Street Journal* article its plans to eliminate new investments in mortgages in order "to repay a substantial part of its \$750 million in debt over the next 18 months." The firm typically reinvested over \$80 million per year as existing loans matured. Additionally, the firm indicated that, if needed, it could sell loan participations or assets to generate additional funds.

Second, external management contracts may not work well for property foreclosed on by mortgage REITs. Prior to the downturn, mortgage REITs financed owner-managed properties and equity REITs provided equity financing for projects that were managed by external contracts. Thus, the benefits of owner-manager financing relative to outside equity financed projects with external management contracts are larger for the kinds of properties financed by mortgage REITs.² Therefore, an ownership stake by the property manager is important for the kinds of properties financed by mortgage REITs.

In summary, mortgage REITs finance highly leveraged positions. To the extent that mortgage REITs cannot manage foreclosed properties in-house at a low cost or are forced by their creditors to liquidate foreclosed real estate, large declines in real estate values would cause mortgage REITs to liquidate real estate at prices below what the property is worth managed by a well-capitalized property manager. These liquidations would have represented buying opportunities for well-capitalized property managers, namely equity REITs.

The annual reports of mortgage REITs during the period studied often warn shareholders that the depressed market for real estate presents a problem for the disposition of foreclosed properties. The annual reports of equity REITs often view the same situation as a good buying opportunity for well-capitalized equity REITs. The following excerpt from the 1989 Annual Report of American Realty Trust, a mortgage REIT, is consistent with statements made in the annual reports of other mortgage REITs during this period:

To the extent that the company seeks to liquidate any of its real estate assets, the sales prices for such properties may also be affected by competition from the Resolution Trust Corporation, the agency of the United States government charged with the liquidation of assets of failed savings and loan institutions, many of which have assets located in the areas in which the company's properties are located, and other governmental and financial institutions seeking to liquidate foreclosed property. To the extent that these entities discount their properties in order to liquidate them quickly, the company may also be forced to discount the sales price of the properties identified for sale.

Several mortgage REITs' annual reports mention that disposing of the real estate that collateralized foreclosed loans was made worse by the large amount of real estate brought to the market as a result of the systematic failure of banks that also made highly leveraged real estate loans.

The 1992 Annual Report of Sizeler Properties points to the buying opportunities for well-capitalized property managers, equity REITs, and is representative of comments made in the annual reports of other equity REITs:

² The average size of a typical project financed by a mortgage REIT was much smaller than the projects financed by equity REITs. Smaller projects may be less amenable to outside equity financing.

The Company believes that the current economic and real estate environment has led to a restructuring of the market for existing real estate, resulting in attractive investment opportunities to those investors with sufficient access to capital. Among other factors, developer bankruptcies, bank and thrift foreclosures, and the limited availability of capital have created acquisition opportunities with higher yields and increased growth potential than were previously available to the Company. Today, investors such as real estate investment trusts, with their access to capital markets, have a competitive advantage in making new acquisitions at attractive initial yields.

During 1991 the Company commenced an acquisition program to take advantage of these favorable market conditions and was successful in acquiring interests in several income-producing properties at attractive initial yields. To finance the Company's equity investment in future acquisitions, the Company initiated and completed in November 1991, a public offering of its common stock. The Company intends to use the proceeds from this equity offering, combined with debt capital to purchase additional shopping center and apartment properties in the southern United States.

II. Mortgage and Equity REITs: 1989–1992

This section describes the data used and the results of (1) a detailed examination of the extent to which mortgage REITs foreclose rather than reorganize their debt claims against commercial mortgages and (2) a comparison of the effects of the decline in real estate collateral values on the tendency for equity and mortgage REITs to liquidate assets.

A. Data

Foreclosure activity by mortgage REITs and net investment by mortgage and equity REITs is examined over the period from 1989 to 1991. Published accounts suggest that the problems in commercial real estate markets began in 1989. The ending date for the real estate downturn is based on data provided by the American Council of Life Insurance which indicate that delinquency rates on commercial real estate loans made by life insurance companies begin to increase in late 1990 and increase through late 1991 and mid-1992, depending on the region of the country and type of property financed.

The sample of 92 REITs used in this analysis is obtained from the list of publicly traded REITs at the end of 1988 provided by the National Association of Real Estate Investment Trusts. Of the 92 REITs identified as being in business at the end of 1988, only four are not in business at the end of 1991. For these firms, I use the data from the last available 10K or annual report.

The amount of real estate equity and mortgages held at the beginning of 1989 and the end of 1991 is obtained for each firm. The dollar amount of equity positions in real estate held by each firm (EQUITY) is measured as

real estate investments at cost before depreciation. Because it eliminates fluctuations in asset values caused by market fluctuations, measuring the amount of real estate held in this way means that the change in EQUITY over time is the best available measure of the net investment in real estate over time.

The amount of real estate loans held by a firm at a point in time (MORTGAGE) is measured as the face value of loans outstanding plus real estate obtained from foreclosures that is held for sale. Real estate obtained from foreclosures is included in the variable MORTGAGE because the original investment is a loan.

Asset writedowns during the 1989 to 1991 time period lead to differences in the change in asset values reported on the balance sheet that do not correspond to net investment. This problem biases against finding greater net investment by equity REITs. Under the American Institute of Certified Public Accountants Statement of Position and Accounting Practices for REITs, real estate mortgage loans remain on the books at historical cost while expected losses and actual minus expected loan losses are reported separately. The book value of mortgage loans is the historical cost of the loans minus the loan loss allowance. In this study, the value of mortgage holdings is measured as the historical cost of the loans. Equity holdings might have been written down. Such writedowns are reported in the notes to the financial statements. Thus, the changes in asset values for mortgage holdings do not include writedowns but the change in asset value for equity holdings might contain writedowns.

The sample of REITs is broken down into 24 mortgage REITs, 20 hybrid REITs (those that have both mortgage and equity positions), and 48 equity REITs. Mortgage REITs that hold single-family mortgages and equity REITs that invest in health care properties are not included in the sample in order to focus on commercial real estate. Most of the single-family mortgages held by mortgage REITs contain third-party credit enhancements. The problems with commercial real estate do not extend to health care properties. Health care equity REITs did not perform poorly during the 1989 to 1991 period. Finally, the sample also excludes finite life REITs that have publicly announced plans to liquidate their holdings.

Firms are classified as mortgage REITs if $\text{EQUITY}/(\text{MORTGAGE} + \text{EQUITY})$ is less than 15 percent. Of the 24 firms classified as mortgage REITs, 17 hold only real estate-backed loans. If $\text{EQUITY}/(\text{MORTGAGE} + \text{EQUITY})$ is greater than 15 percent but less than 85 percent, the firm is classified as a hybrid REIT. If $\text{EQUITY}/(\text{EQUITY} + \text{MORTGAGE})$ is 85 percent or more, the firm is classified as an equity REIT. Of the 48 firms classified as equity REITs, 24 hold no mortgages.

Summary statistics for the sample are provided in Table I. Leverage is measured as the ratio of long- and short-term debt obligations plus long-term lease obligations to the book value of assets. The average REIT's financial leverage is just over 30 percent for all three groups. Size is measured as the book value of assets. In addition, I calculate the extent to which there

Table I
Summary Statistics for Sample REITs

This table presents summary statistics for the sample of 24 mortgage Real Estate Investment Trusts (REITs), 20 hybrid REITs, and 48 equity REITs based on data obtained from 10K filings and annual reports for the end of 1988. Equity REITs hold more than 85 percent of their assets in real estate equity positions. Hybrid REITs hold less than 85 percent but more than 15 percent of their assets in real estate equity positions. Mortgage REITs hold less than 15 percent of their assets in real estate equity positions. Assets are measured as book value of assets in millions of dollars. Leverage is the ratio of long-term and short-term debt obligations plus long-term lease obligations to total assets.

	Assets	Leverage
Mortgage REITs, $n = 24$		
Mean	293.6	30.6%
Median	151.8	33.1%
Hybrid REITs, $n = 20$		
Mean	225.5	31.1%
Median	149.7	32.7%
Equity REITs, $n = 48$		
Mean	153.8	35.6%
Median	119.6	32.8%

are prior liens against the loans held by mortgage REITs. The average ratio of prior liens to the sum of prior liens and mortgage loans is 13.6 percent for the mortgage REITs.

Viewing the empirical analysis provided in this paper as evidence on how leverage and ownership structure affect a firm's response to an adverse shock to asset values requires the assumption that the real estate underlying the mortgage and equity positions held by mortgage and equity REITs is similar. The magnitude of the real estate decline was not uniform over the entire United States. Some regions were hit harder than others. Thus, it is important to demonstrate that the mortgage REITs in this study do not have a particular geographic focus relative to equity REITs. Along the same lines, it is important to demonstrate that the results provided here are not driven by the fact that mortgage or equity REITs are heavily invested in a particular property type.

Based on information reported in SEC filings and information reported by the National Association of Real Estate Investment Trusts, each REIT is classified by its geographic focus and property type focus. If a REIT had no clear geographic focus or property type focus, the REIT is labeled a "mixed" geographic focus or a "mixed" property type focus. Panel A of Table II provides a geographic focus breakdown for the mortgage REITs, equity REITs, and hybrid REITs. The breakdown by property type focus is provided in Panel B.

There are seven possible geographic focuses: mixed, southeast, northeast, southwest, west, east, and midwest. More than half of the mortgage, hybrid, and equity REITs have a mixed geographic focus. The only evidence

Table II
Geographic and Property Type Focus for Sample REITs

This table provides the geographic and property type focus for the sample of 92 Real Estate Investment Trusts (REITs). The data are reported separately for mortgage, equity, and hybrid REITs. Equity REITs hold more than 85 percent of their assets in real estate equity positions. Hybrid REITs hold less than 85 percent but more than 15 percent of their assets in real estate equity positions. Mortgage REITs hold less than 15 percent of their assets in real estate equity positions. The geographic and property type focus are determined from information provided by the National Association of Real Estate Investment Trusts and SEC filings. Each firm is characterized as having no geographic or property type focus (mixed) or as focusing on one of six geographic areas and focusing on one of eight property types.

	Mortgage REITs	Hybrid REITs	Equity REITs
Panel A: Geographic Focus			
Mixed	17	14	26
Southeast	1	2	4
Northeast	0	1	1
Southwest	4	0	2
West	0	1	10
East	0	0	2
Midwest	2	2	3
Total	24	20	48
Panel B: Property Type Focus			
Mixed	14	10	28
Office	1	2	5
Individual/Office	0	1	2
Land	3	0	0
Multifamily	2	2	0
Warehouse/Storage	1	1	3
Shopping center	1	1	9
Single family	1	2	0
Hotel	1	1	1
Total	24	20	48

of geographic clustering is that four of 24 mortgage REITs are in the southwest. Further, the portfolios of 10 of 47 equity REITs are exclusively in the west.

There are nine possible property type focuses: mixed, office, industrial and office, land, multifamily, warehouse/storage, shopping malls, single family, and hotels. Again, well over half of the mortgage, hybrid, and equity REITs have no particular property type focus—they are classified as mixed. This is consistent with Ling and Ryngaert (1997) who report that REITs created prior to the early 1990s do not typically have a property type focus. However, nine of the 47 equity REITs largely finance shopping malls.

Table III

Outcomes of Defaulted Loans Held by Mortgage REITS

This table presents the outcomes of default for loans held by the 24 sample mortgage REITs. The total number of loans is the total number of commercial real estate loans held by mortgage REITs at the end of 1988. Loans are categorized as (1) in foreclosure, (2) short-term extensions, (3) long-term extensions or (4) Chapter 11 filings based on reading each annual report over the 1989 to 1991 period. Foreclosed loans are the loans that are deemed foreclosed or obtained by deed in lieu of foreclosure by the lender. Short-term extensions are loans where the defaulted loan maturity is extended one year or less. Long-term extensions are loans where the defaulted loan maturity is extended more than one year. Chapter 11 loans are those defaulted loans where the borrower filed for Chapter 11 protection. The total and average face value of loans in each category are in millions of dollars.

	Total Loans	Foreclosure Loans	Short-Term Extensions	Long-Term Extensions	Chapter 11
Number	1,289	354	24	31	12
Total face value	4,441.7	1,198.10	66.62	303.55	113.55
Average face value	3.45	3.39	2.75	9.64	9.37

B. Mortgage REIT Foreclosures

This section examines how each mortgage REIT handles its loans in default on a loan-by-loan basis. Because they lack the resources necessary to manage properties, it is expected that mortgage REITs do not often reorganize their defaulted loans. Rather, mortgage REITs are expected to foreclose on the loans.

Table III provides a loan-by-loan breakdown of how mortgage REITs handle defaulted loans. I examine the annual reports for each year over the 1989 to 1991 period for each mortgage REIT and characterize each defaulted loan as a foreclosure, a short-term extension (the loan maturity was extended one year or less), a long-term extension (the loan maturity was extended more than one year), or a Chapter 11 filing (the borrower filed for Chapter 11 protection). The total dollar face value of loans and the average face value of loans in each category are provided.

Mortgage REITs hold 1,289 commercial mortgage loans with an aggregate face value of \$4,441.7 million at the end of 1988. The average loan balance at the end of 1988 is \$3.45 million. A total of 421 loans (or 33 percent of the total loans outstanding at the end of 1988) default over the 1989 to 1992 period. The vast majority of the defaulted loans are foreclosed: 354 loans out of the 421. Additionally, only 24 of the 421 defaulted loans are extended by one year or less.

C. Net Investment by Mortgage and Equity REITs

Table IV shows the level of EQUITY and the percentage change in EQUITY from the beginning of 1989 to the end of 1991 (EQUITY GROWTH), the level of MORTGAGE and the percentage change in mortgage from the

Table IV
Investments of REITs: 1989–1991

This table presents data on the mortgage holdings and equity positions held by mortgage, equity, and hybrid REITs. Panel A provides summary statistics on the percentage increase from the end of 1988 to the end of 1991. Mortgage Growth is the percentage increase in mortgage holdings, Equity Growth is the percentage increase in equity positions, and Total Growth is the percentage increase in total assets. Panel B presents the level of mortgage and equity holdings (in, millions of dollars) at the end of 1988 and the end of 1991. Firms are characterized as equity, mortgage, and hybrid REITs based on their holdings at the end of 1988.

Panel A				
	Mortgage Growth	Equity Growth	Total Growth	
Mortgage REITs, $n = 24$				
Mean	-21.99%	136.11%	-8.48%	
Median	-19.77%	33.71%	-10.22%	
Hybrid REITs, $n = 20$				
Mean	-15.22%	19.87%	4.66%	
Median	-13.17%	17.13%	-2.09%	
Equity REITs, $n = 48$				
Mean	-4.55%	15.82%	14.93%	
Median	-5.01%	14.27%	3.70%	
Panel B				
	Equity Holdings		Mortgage Holdings	
	12/88	12/91	12/88	12/91
Mortgage REITs, $n = 24$	79.7	188.2	4,441.7	3,464.9
Hybrid REITs, $n = 20$	1,311.5	1,572.1	966.4	819.2
Equity REITs, $n = 48$	6,348.8	7,353.1	323.7	308.9

beginning of 1989 to the end of 1991 (MORTGAGE GROWTH), and the percent change in total assets (TOTAL GROWTH). The data presented support the hypothesis that the real estate decline had a different effect on investment behavior for mortgage and equity REITs. The average growth rate of total assets is -8.48 percent for mortgage REITs, 4.66 percent for hybrid REITs, and 14.93 percent for equity REITs. The average growth rate of mortgage holdings is -21.99 percent for mortgage REITs and -15.22 percent for hybrid REITs. The average growth rates of equity investments for hybrid REITs is 19.87 percent and 15.82 percent for equity REITs.

Mortgage REITs hold \$4.4 billion in mortgages at the end of 1988, but by the end of 1991 mortgage holdings have fallen to \$3.5 billion. Hybrid REITs hold \$966 million in mortgages at the end of 1988, but only \$819 million by the end of 1991. Mortgage REITs have significant holdings of foreclosed real estate at the end of 1991: \$261.3 million is classified as "in default" or "obtained from foreclosure." By comparison, mortgage REITs report \$69.6 million in loans classified as in default or obtained from foreclosure in 1989.

Equity holdings by hybrid and equity REITs increase during the period studied. Equity REITs hold \$6.3 billion in equity at the end of 1988, and by the end of 1991 their real estate holdings (at cost) are \$7.4 billion. Hybrid REITs increase their real estate holdings (at cost) from \$1.3 billion to \$1.6 billion over the 1988 to 1991 period.

To determine if there is a statistically significant relationship between the extent of real estate investment and the proportion of a REIT's real estate investments in commercial real estate mortgages (as opposed to commercial real estate equity) and financial leverage, the following regression is estimated for the sample of 92 REITs:

$$\begin{aligned} \text{GROWTH} = & 0.05 - 0.20 \text{ MORTGAGE PERCENT} \\ & (0.51) \quad (-1.81) \\ & + 0.99 \text{ LEVERAGE} - 1.40 (\text{LEVERAGE})^2, \quad (1) \\ & (1.65) \quad (-1.89) \end{aligned}$$

where the numbers in parentheses are *t*-statistics. The regression R^2 is 0.09. Growth is the percentage increase in total real estate investment (mortgage and equity investment) over the 1989 to 1991 period, MORTGAGE PERCENT is the percentage of end-of-1988 real estate investments in mortgages, and LEVERAGE is the predownturn (end of 1988) ratio of debt to total assets. The coefficients of the MORTGAGE PERCENT and (LEVERAGE)² variables are significantly different from zero at the 10 percent level.³ Thus, there is a statistically significant negative relationship between the extent to which REITs are invested in mortgages at the end of 1989 and the amount of net investment over the 1989 to 1991 period.

The extent of predownturn financial leverage is negatively related to subsequent investment for firms with extremely high financial leverage. The estimated coefficients imply that for the REIT with financial leverage of 33 percent (the sample median), the marginal effect of additional leverage on the subsequent growth is zero. However, about 20 percent of the sample firms have financial leverage of 50 percent or more. For firms with financial leverage of 50 percent a one percent increase in financial leverage results in a -0.41 percent decrease in financial subsequent growth.

Given the evidence that mortgage REITs are net sellers, I examine the factors that influence the extent to which mortgage REITs are net sellers. In particular, I examine two hypotheses. First, the mortgage REIT itself has debt outstanding and the mortgage REIT's senior lenders may very well prefer and be able to force a liquidation of nonperforming loans. The gains from managing the foreclosed loans are likely to largely accrue to the mortgage REIT equity holders. This suggests that (1) more leveraged mortgage REITs are more likely to foreclose than reorganize their debt and (2) more leveraged REITs are more likely to sell foreclosed property than to manage

³ The variables LEVERAGE and LEVERAGE² are not significant in models of the rate of growth in assets for mortgage REITs that include both variables.

it in-house. Thus, there is a stronger theoretical motivation for a negative relationship between leverage and net investment for the sample of mortgage REITs.

Second, some of the mortgage REITs in the sample provide debt financing for partnerships sponsored by the property management advisory company. In this case, I expect that defaulted properties are less likely to be sold since managerial equity is clearly not as important for these properties because they are financed with much less manager equity investment than the non-affiliated mortgage REITs.

To test these hypotheses, I estimate the following model on the sample of 24 mortgage REITs:

$$\text{GROWTH} = 0.06 + 0.51\text{MANAGE} - 0.16\text{LEVERAGE}, \quad (2)$$

(0.26) (1.73) (-0.72)

where the numbers in parentheses are *t*-statistics. MANAGE is a dummy variable that equals one when any of the mortgage REIT's loans are made to borrowers that are a partnership affiliated with the mortgage REIT property management company. Though each mortgage REIT lends to several borrowers, in most cases all of their loans are either to affiliated borrowers or all of their loans are to nonaffiliated borrowers. The estimated coefficient on the MANAGE variable is significantly different from zero at the 10 percent level. The estimated coefficient on the LEVERAGE variable is not significantly different from zero. These results imply that the growth for affiliated properties is 31 percent greater than for nonaffiliated properties.

These results indicate that over the 1989 to 1992 period equity REITs are net purchasers of real estate and that mortgage REITs are net sellers of real estate. Since 10K reports and annual reports do not systematically indicate the seller in equity REIT purchases, I cannot determine if equity REITs purchased property from mortgage REITs through foreclosure sales or related transactions. However, some equity REITs do indicate that they purchased property through foreclosures. For example, the 1992 Annual Report of First Union Real Estate Trust, an equity REIT, states that "during the last year the registrant has purchased two apartment complexes and acquired four other apartment complexes through three foreclosure sales and a deed in lieu of foreclosure."

III. Total Returns

Transaction level evidence that mortgage REITs sold assets to equity REITs at fire-sale prices during the real estate downturn is not available. However, indirect evidence of significant financial distress related costs can be obtained by comparing the reaction of mortgage REIT stock returns and equity REIT stock returns to the real estate collateral value shock. The following example shows that, in the absence of financial distress related costs, the equity REITs with financial leverage similar to the firms in this sample are expected to experience more negative stock returns during a downturn in

asset values than the mortgage REITs with financial leverage and prior liens similar to the firms in this sample. However, with large financial distress costs, mortgage REITs are expected to have more negative stock returns.

Consider a real estate asset with a value of \$100 that is the only asset held by an equity REIT that has \$30 in debt outstanding. The debt of the average equity REIT in this sample is approximately 30 percent of the book value of the REIT's assets. For simplicity, I assume that the REIT's debt is riskless. Thus, the equity REIT has a claim worth \$70. Now suppose that the value of the real estate falls by 30 percent to \$70. The equity owners now have a claim worth \$40. The equity claim falls in value by 43 percent as a result of a 30 percent decline in the value of the real estate asset.

Now consider the decline in the value of the equity of a mortgage REIT after a similar decline in the value of the real estate asset to which the mortgage REIT has a claim. The assets of the mortgage REIT are a \$100 loan and, consistent with the firms in this sample, the mortgage REIT has \$30 in face value of debt outstanding. However, the mortgage REIT's loan is not always the only debt claim against the real estate. I assume that the prior liens against the real estate are \$30 and the loan-to-value ratio of the real estate asset is 87 percent, which implies there is \$20 worth of equity in this project. The prior liens are 30 percent of the mortgage REIT assets, which is higher than the 13.6 percent average for the sample of mortgage REITs (only two of the mortgage REITs had prior liens greater than 30 percent of the mortgage REIT assets and none had prior liens greater than 40 percent of the mortgage REIT assets). Thus, the mortgage REIT holds a \$100 loan against a \$150 real estate asset. The prior lien holders have the right to the first \$30. The creditors of the REIT have the right to the next \$30, the holders of the mortgage REIT equity own the right to the next \$70, and the property manager holds the residual.

A 30 percent decline in the value of the assets leaves the real estate assets worth \$105. The value of the mortgage REIT's \$100 loan is only \$75 and the value of the claim held by the mortgage REIT's equity investors becomes worth only \$45. In contrast to the 43 percent decline in the equity value of the equity REIT (from \$70 to \$40), the mortgage REIT equity only falls in value by 36 percent (from \$70 to \$45). Thus, for reasonable parameter values and no financial distress related costs, the mortgage REITs should experience a smaller decline in equity value.

Although the mortgage REIT is expected to suffer a smaller decline in value during a downturn in the absence of financial distress costs, in the above example the equity position in the real estate asset is insolvent in the case of the mortgage REIT and the equity REIT continues to be solvent. Therefore, the mortgage REIT will incur significant financial distress related costs whereas the equity REIT will not. If there are substantial financial distress related costs, some of the \$105 value of the real estate asset might be lost and the value of the mortgage REIT's claim would be less than \$45, perhaps less than \$40, in which case the decline in the value of the real estate would cause the mortgage REIT's claim to fall more than the equity

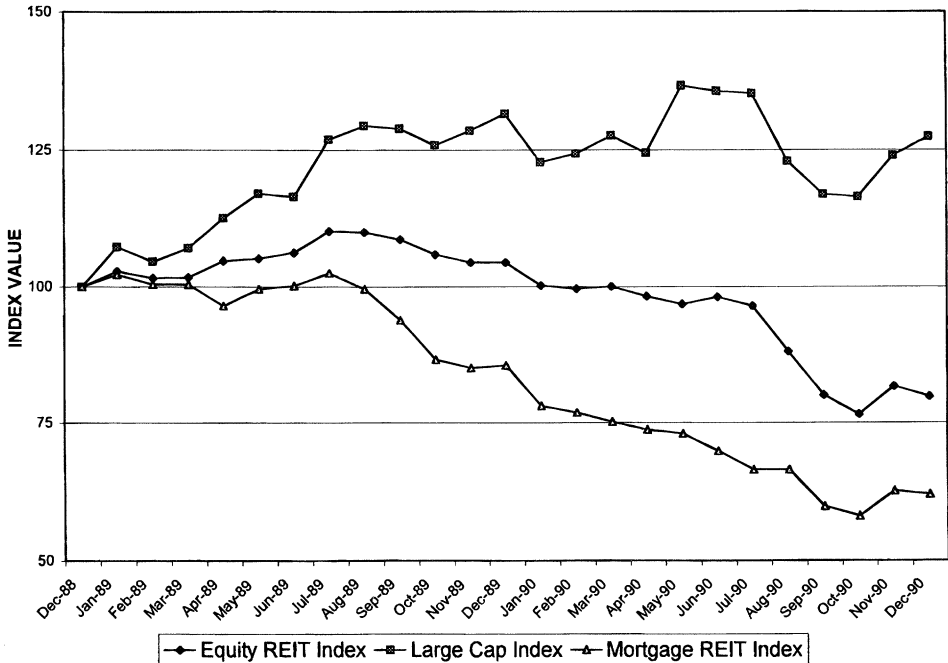


Figure 1. Total return index: 1989—1990. The value of a \$100 investment made on January 1, 1989 is traced through the end of 1990 in (1) an equity REIT portfolio, (2) an Ibbotson and Associates large capitalization stock index, and (3) a commercial mortgage REIT portfolio. The equity REIT portfolio consists of the 48 REITs identified by the National Association of Real Estate Investment Trusts as having at least 85 percent of their assets invested in commercial real estate equity positions at the end of 1988. The mortgage REIT portfolio consists of the 24 REITs identified by the National Association of Real Estate Investment Trust as having at least 85 percent of their assets invested in commercial real estate mortgage loans.

REIT's claim. The most likely financial distress related cost is suboptimal liquidation. Specifically, if the large-scale liquidations of foreclosed properties depress the proceeds of real estate assets sold by mortgage REITs and create buying opportunities for equity REITs, then it is possible that the total returns to mortgage REIT stocks would actually be less (more negative) than the total returns to equity REIT stocks.

In addition to financial distress costs resulting from liquidations, the decline in real estate asset values is also expected to reduce the ability of mortgage REITs to make additional profitable commercial real estate loans. The decline in collateral values greatly reduces the equity positions of the pool of existing property owner-managers and owner-developers. This greatly reduces the pool of potential borrowers typically served by mortgage REITs that are able to put an equity stake in commercial real estate ventures.

To test this proposition, a value-weighted total return index for the sample of equity and mortgage REITs over the 1989 to 1990 time period is created. The stock price analysis stops a year earlier than the foreclosure and net

Table V
Mortgage and Equity REIT Stock Returns: 1989–1990

This table presents the average monthly stock returns for portfolios of mortgage and equity REITs over the 1989 to 1990 period. The equity REITs examined are the 48 REITs identified by the National Association of Real Estate Investment Trusts as having at least 85 percent of their assets invested in commercial real estate equity positions at the end of 1988. The mortgage REITs examined are the 24 REITs identified by the National Association of Real Estate Investment Trust as having at least 85 percent of their assets invested in commercial real estate mortgage loans.

	Mean Return	Standard Deviation
Mortgage REITs	−1.91%**	3.88%
Equity REITs	−0.88%	3.43%
Equity REITs – Mortgage REITs	1.03%*	3.01%

*, ** Indicate significant differences from zero at the 10 and 5 percent levels, respectively.

investment analysis for two reasons. First, the stock price should capitalize the anticipated effects of activities like asset sales, asset purchases, and foreclosures resulting from a shock to collateral values before they appear on the balance sheet. In other words, (1) the stock price decline incorporates subsequent transactions that are anticipated to result from the shock to asset values and (2) these transactions take some time to complete. Second, equity REITs had negative stock returns during the 1989 to 1990 period. Choosing a time period for the stock return analysis based on the severity of the declines in equity prices biases against a finding that mortgage REITs suffered greater stock price declines.

The value of a \$100 investment at the beginning of 1989 in the portfolio of mortgage and equity REITs is provided in Figure 1. For comparison, the value of an investment in the Ibbotson and Associates large capitalization stock index is also provided.

Figure 1 shows a dramatic decline in both REIT portfolio values and a larger decline in the value of mortgage REIT stocks. A \$100 investment in the equity REIT portfolio fell in value to \$79.77 by the end of 1990. A \$100 investment in the mortgage REIT portfolio fell in value to \$61.85 by the end of 1990.

The average monthly returns for the mortgage and equity REIT portfolios are presented in Table V. The mean monthly return is −1.91 percent for mortgage REITs and −0.88 percent for equity REITs. The mean difference between the equity and mortgage portfolio monthly returns is significantly different from zero at the 10 percent level.

It is important to note that many of the loans made by mortgage REITs are fixed-rate loans. The larger decline in mortgage REIT stock prices is not due to an increase in interest rates. The 10-year Treasury bond yield actually fell from 9.09 percent to 8.08 percent during the period examined.

IV. Summary and Conclusion

This study examines the effects of the large decline in real estate values that occurred in 1989 and 1990 across properties that have very different ownership structures and financial leverage. The analysis reveals three empirical findings. First, the institutions that financed real estate investment through highly leveraged loans, mortgage REITs, significantly reduced their net investment in real estate during the downturn. This disinvestment was the result of sales of foreclosed properties combined with little new lending. Second, a thorough, loan-by-loan analysis of the mortgage REIT holdings reveals that mortgage REITs rarely agreed to reorganize their defaulted loans. The vast majority of loans were foreclosed in spite of indications that the market for commercial real estate was very depressed. Third, mortgage REIT stock returns were significantly more negative than equity REIT stock returns during the downturn.

The implications of these findings are twofold. First, this study provides strong evidence of asset illiquidity in an industry-wide downturn. The potential for asset illiquidity in an industry-wide downturn has important consequences for debt capacity (see Shleifer and Vishny (1992)). Second, this study provides evidence that owner-managed entities may be particularly vulnerable because lenders' incentives to reorganize to avoid a foreclosure sale in a depressed market are limited. This evidence supports ideas presented in Brown (1997) and Diamond (1991, 1993).

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