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# The Performance of REIT-owned Properties and the Impact of REIT Market Power

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***Abstract***

Using a unique, detailed panel dataset of lodging properties, this paper tests whether properties owned by real estate investment trusts (REITs) perform differently than other properties and whether the concentration of real estate ownership brought about by REITs has increased market power. Our results demonstrate that REIT-owned properties, which are primarily mid-scale and high-end hotels, did not perform significantly better, on average, than other mid-scale or high-end hotels in the same geographic area. However, because of the superior overall performance of mid-scale and high-end hotels, REIT properties as a whole did perform better, on average, than non-REIT properties. From these results we conclude that the superior performance of REIT properties was due to the fact that REITs tended to acquire properties in market segments that performed well; REIT ownership in itself does not appear to have increased performance. Our results also suggest that the superior performance of the market segments in which REITs have a significant presence is not attributable to the market power of the REITs.

**Key Words:** REITs, hotels, competition, market power

## 1. Introduction

Real estate investment trusts (REITs) are corporations, trusts or associations that meet certain criterion stipulated in the tax code and which elect to be treated as a REIT for tax purposes. Similar to mutual funds, REITs pay no corporate income tax on earnings distributed to shareholders.[1] Between 1990 and 2002, REIT market capitalization increased from \$9 billion to \$154 billion.[2] Over the same period, assets under management have grown from \$44 billion to \$340 billion.[3] REIT growth was accomplished primarily by acquiring existing income-producing properties from individuals and partnerships. By funneling new funds into real estate, REITs are credited with helping the commercial property sector recover after the credit crunch of the early 1990s. REITs now hold a sizeable share of income-producing properties and play an important role in the real estate industry.[4] However, the full significance of such a large transfer of commercial property from private individuals and partnerships to publicly traded REITs is not well understood.

When REITs were rapidly growing in the mid-1990s, a popular belief was that the transfer of property to large, publicly traded REITs would improve the management of the

acquired properties. For example, a 1997 *Business Week* article states that one advantage of REIT property ownership is that they offered ''... professional corporate-style management.''[5] The article further states,

> Until the early 1990s, most real estate was owned by private, family-owned companies that relied entirely on borrowed money and generated returns by flipping properties ... [A REIT CEO] sums it up: ''Often, private ownership led to improper financing, managing, and evaluation of real estate. The public market keeps those kinds of mistakes from being made.''

In the same year, a *Fortune* article also cites better management as an attribute of REITs:

> People in the industry point to better management as well as consolidation that has primed the pump, allowing publicly traded REITs to buy property now in private hands and boost their earning power.[6]

A *Wall Street Journal* article sounds a similar theme, describing REITs as encouraging property managers to ''... market and run properties aggressively.''[7] In particular they document one apartment manager's method of instituting frequent rent and fee increases. Despite the fact that there is no analytic basis for the hypothesis that public ownership of real estate would lead to better property management, the prevalence of this perception in media coverage makes it worthy of empirical analysis.

The ability of REITs to access the public capital markets to amass large real estate portfolios may cause the expansion of REIT ownership to have other industry effects besides property management.[8] First, by increasing market share, REITs have the potential to acquire substantial market power in particular local markets.[9] Second, large portfolios may allow REITs to realize economies of scale by reducing back-office and maintenance expenses.[10] Finally, it is argued that public market oversight of real estate, through both ownership of property by REITs and lending through commercial mortgage backed securities, will discipline development and attenuate the boom and bust cycle in real estate.[11] In particular, the increased availability of market information and analysis associated with public ownership of real estate could potentially allow firms to better predict future demand and supply conditions.[12]

This paper investigates two possible implications of the growth of REITs: whether or not REIT-owned properties perform better than non-REIT properties and whether or not properties in markets in which REITs have a significant market share perform better than properties in other markets. To date, these issues have not been addressed in the literature. The majority of the existing empirical literature on REITs uses financial market information to examine REIT returns, liquidity and the role of REIT shares in portfolio diversification. (See, for example, Clayton and MacKinnon, 2000; Allen et al., 2000; Gyourko and Nelling, 1996; Geltner and Kluger, 1998.) While a few studies use property-level accounting data to test for economies of scale and scope (such as Capozza and Seguin, 1999), none compare the performance of REIT-owned properties with non-REIT properties.

We use annual property-level information on hotels in Texas to determine whether REIT properties performed better than other properties, with performance measured by revenue growth, revenue per available room (REVPAR) growth, occupancy growth, and average price per room growth. Our results indicate that the performance of REIT-owned hotels, as measured by each of the four growth measures, was not appreciably different from other hotels that offer similar amenities (i.e., in the same segment). As a group, REIT-owned hotels did on average perform better than all non-REIT hotels, but this was due to the fact that REITs invested in segments that performed well over this period. This suggests that the superior performance of REIT-owned properties was not the result of REIT ownership leading to better property management. We also test whether the percent of capacity owned by REITs in a particular market affected the performance measures for all properties in that market and find that REIT market concentration had not affected the average performance of properties in those markets.

## 2. Background and data

REITs are prohibited from actively managing their properties and must receive their income from passive sources, such as rental and interest payments.[13] REITs are allowed to provide services customarily furnished in connection with the rental of real property, such as general maintenance and the provision of utilities, and are allowed to treat payment for these services as rental income. Hotel REITs typically lease their properties to operators using percentage leases. Under these agreements, REITs receive rental income equal to the greater of a fixed payment or a fixed percentage of total revenue. Two-thirds of the REIT owned hotels in our sample were percentage leased.

Some REITs were able to get around the active management restriction by creating so-called ''stapled'' REITs. In this structure, two separate corporations are established—a REIT and a taxable operating company. Shareholders receive one share of the operating company for every share of the REIT they own, and the shares then trade together as if they were stapled. The Internal Revenue Service ruled that the structure was illegal, but allowed existing stapled REITs to keep their structure.[14] Other REITs later simulated the stapled REIT structure by creating so-called ''paper-clipped'' REITs. Like their stapled brethren, paper-clipped REITs issue to shareholders one share of a separate operating company for every REIT share they own, but there is no subsequent requirement that the shares trade together. Thus stapled and paper-clipped REITs have the ability to both own and operate hotels. One-third of the REIT-owned hotels in our sample were owned by either stapled or paper-clipped REITs. In the analysis that follows we do not distinguish between traditional REITs and stapled or paper-clipped REITs.[15]

To test the effect of REIT ownership on property performance, we obtained annual data from the years 1991 to 1998 from Source Strategy Incorporated (SSI), a private consulting firm in San Antonio, on all lodging properties in Texas with gross annual revenue over $13,000. This data includes 22,519 property-year observations. From state tax-return data, SSI reports a property's gross annual revenue, number of rooms, number of days open, REVPAR, brand affiliation and zip code.[16] SSI also obtained the average price per room

for each property using surveys, financial reports, appraisers and directories. From the annual revenue and average price per room, SSI is then able to calculate the number of rooms booked that year. From this information, SSI calculates occupancy rate (number of rooms booked divided by number of rooms divided by days open).

Using the data provided from SSI, we were able to identify for each observation the market segment of the brand affiliated properties, whether or not the property is located in a Metropolitan Statistical Area (MSA), and whether or not a REIT owns the property. Brands are classified into nine segments based on information obtained from numerous lodging industry publications and experts (deluxe, luxury, upscale, midscale with food and beverage, midscale without food and beverage, economy, budget, upper-tier extended stay and lower-tier extended stay).[17] Zip codes were used to identify properties located in one of the 24 MSAs in Texas, as classified by the U.S. Census in 1996. To identify properties owned by REITs and their acquisition dates, we consulted the National Real Estate Index REIT Property Directory.[18]

Table 1 displays the sample counts by year and REIT status.[19] By 1998 there are 3,051 hotels in the sample, of which 91 are owned by REITs.[20] In total, there are 222 property-year observations of hotels owned by REITs.[21] Although REITs owned few hotels early in the period, REITs acquired 80 hotels between 1995 and 1998.

Table 2 illustrates that the hotels owned by REITs are quite different from the sample as a whole. Average revenue from REIT hotels is nearly $4\frac{1}{2}$ times higher than average revenue from non-REIT hotels.[22] REITs generate this higher revenue by owning hotels with more than twice as many rooms and achieving a much higher REVPAR. REITs superior REVPAR is due to both higher average prices per room and higher occupancy rates. Nearly all REIT hotels are in MSAs and nearly all are brand-affiliated.

Table 3 breaks out brand-affiliated hotels by market segment. Although only 40 percent of the sample is brand affiliated, by 1998, all REIT hotels were brand affiliated. Compared to other brand-affiliated hotels in the sample, REIT properties are more heavily weighted toward high-end hotels. Over 40 percent of REIT hotels are in the mid-scale categories, versus about 30 percent of non-REIT, brand-affiliated hotels. About 26 percent of REIT hotels are in either the upscale, luxury, or deluxe segment versus only 11 percent of non-REIT, brand-affiliated hotels. Another 28 percent of REIT hotels are in the upper-tier extended-stay segment versus only 4 percent of non-REIT, brand-affiliated hotels. The memo column in Table 3 reports, for 1998, the percent of hotels within each segment that are owned by REITs. REITs account for a negligible portion of the combined budget, economy, and lower-tier extended-stay properties, about 6 percent of mid-scale hotels, and about 28 percent of the combined upscale, luxury, deluxe and upper-tier extended-stay hotels.

*Table 1.* Number of lodging properties in Texas and the number owned by REITs.

| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|---|
| Total properties | 2,669 | 2,686 | 2,721 | 2,778 | 2,806 | 2,884 | 2,924 | 3,051 |
| Total properties owned by REITS | 4 | 4 | 4 | 6 | 11 | 32 | 70 | 91 |

*Table 2*. Comparing performance measures of lodging properties not owned by REITs with those owned by REITs (averages of property-year observations).

| | Non-REIT Properties | REIT Properties |
|---|---|---|
| Revenue (millions) | 1.07 | 4.44 |
| Number of rooms | 84.5 | 201.7 |
| REVPAR[a] | 25.91 | 57.78 |
| Occupancy rate (percent) | 53.4 | 69.5 |
| Average price | 46.76 | 82.10 |
| Percent brand-affiliated | 40.0 | 96.8 |
| Percent in a MSA | 74.1 | 99.5 |

[a]REVPAR, Revenue per available room (revenue divided by number of rooms divided by days open).

*Table 3*. Comparing segment composition of lodging properties not owned by REITs with those owned by REITs for all properties and only brand affiliated properties (percent of property-year observations).

| | All properties | | Brand-affiliated | | Memo: Percent Segment Owned by REITs in 1998 |
|---|---|---|---|---|---|
| | Non-REIT (22,297)[a] | REIT (222)[a] | Non-REIT (8,868)[a] | REIT (215)[a] | |
| Independent | 60.2 | 3.2 | 0.0 | 0.0 | 0.0 |
| Budget | 9.1 | 0.0 | 22.9 | 0.0 | 0.0 |
| Economy | 11.8 | 5.4 | 29.7 | 5.6 | 0.4 |
| Mid-scale without food and beverage | 6.0 | 27.5 | 15.0 | 28.4 | 6.1 |
| Mid-scale with food and Beverage | 6.2 | 11.7 | 15.7 | 12.1 | 6.3 |
| Upscale | 2.4 | 16.7 | 6.1 | 17.2 | 24.1 |
| Luxury | 1.6 | 6.3 | 4.0 | 6.5 | 16.3 |
| Deluxe | 0.2 | 2.3 | 0.6 | 2.3 | 62.5 |
| Lower-tier extended stay | 0.9 | 0.0 | 2.3 | 0.0 | 0.0 |
| Upper-tier extended stay | 1.4 | 27.0 | 3.6 | 27.9 | 33.8 |
| Total | 100 | 100 | 100 | 100 | |

[a]Number of property-year observations.

Table 4 provides average performance measures by year and REIT status. Four performance measures are used: revenue growth, REVPAR growth, occupancy growth and price growth.[23] As shown in the upper panel, REIT hotels had slower revenue growth than other hotels (8.1 percent versus 14.3 percent). This is not surprising because over this period REITs generally acquired mature, stabilized properties; properties in the sample with rapid revenue growth often had noticeable annual increases in number of rooms and number of days open, suggesting that the properties were either new or recently renovated. However, when comparing REVPAR, which controls for the number of rooms and days open, REIT properties had much higher growth. Non-REIT hotels had a higher growth rate in occupancy overall (2.5 percent versus 1.0 percent). Again, this may be due to the fact that REITs acquired mature stabilized properties, as occupancy growth tended to be highest for those hotels with low occupancy rates. The growth in average-price per room was greater for the REIT properties in the sample.

*Table 4.* Comparing performance measures across years of lodging properties not owned by REITs with those owned by REITs (top panel) and of lodging properties never owned by REITs with those owned at some time by REITS (bottom panel).

| Growth Rate[a] | | All Years | Year 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|---|---|
| *Non-REIT vs. REIT* | | | | | | | | | |
| Revenue | Non-REIT | 14.3 | 11.8 | 12.8 | 13.9 | 11.4 | 13.1 | 16.1 | 20.5 |
| | REIT | 8.1 | − 0.6 | − 3.1 | 1.6 | 2.5 | 5.5 | 10.4 | 9.6 |
| REVPAR | Non-REIT | 3.8 | 4.7 | 5.3 | 6.7 | 2.8 | − 0.2 | 2.3 | 4.7 |
| | REIT | 6.7 | − 0.6 | − 3.0 | 1.5 | 2.5 | 0.2 | 6.7 | 10.7 |
| Occupancy | Non-REIT | 2.5 | 3.8 | 5.1 | 5.8 | 1.0 | − 0.8 | 1.3 | 1.7 |
| | REIT | 1.0 | − 4.2 | 0.1 | − 0.0 | − 0.2 | − 2.5 | 3.5 | 0.9 |
| Price | Non-REIT | 1.1 | 0.7 | 0.1 | 0.8 | 1.5 | 0.5 | 0.9 | 3.0 |
| | REIT | 4.0 | − 1.4 | − 3.7 | 0.4 | 2.6 | 2.9 | 3.0 | 6.0 |
| *Never REIT vs. ever REIT* | | | | | | | | | |
| Revenue | Never REIT | 14.4 | 11.9 | 13.0 | 14.0 | 11.6 | 13.0 | 16.1 | 20.5 |
| | Ever REIT | 8.6 | 7.9 | 4.9 | 7.8 | 4.2 | 14.6 | 10.0 | 9.6 |
| REVPAR | Never REIT | 3.7 | 4.6 | 5.3 | 6.7 | 2.8 | − 0.3 | 2.3 | 4.7 |
| | Ever REIT | 6.5 | 7.7 | 5.3 | 7.9 | 4.2 | 2.1 | 6.4 | 10.7 |
| Occupancy | Never REIT | 2.5 | 3.7 | 5.1 | 5.8 | 1.1 | − 0.9 | 1.3 | 1.7 |
| | Ever REIT | 2.3 | 6.4 | 3.7 | 4.0 | − 0.6 | − 1.0 | 3.1 | 0.9 |
| Price | Never REIT | 1.1 | 0.7 | 0.1 | 0.7 | 1.4 | 0.5 | 0.9 | 3.0 |
| | Ever REIT | 3.4 | 0.9 | 1.4 | 3.7 | 4.9 | 3.2 | 3.1 | 6.0 |

[a]Growth rate is defined as the percent change from the prior year.

By all measures, REIT performance improved markedly after 1995. Recall that most of the hotels in the sample that were owned by REITs were acquired after 1995. This suggests that hotels acquired by the newly established REITs of the early 1990s performed markedly better than other hotels. In particular, REVPAR growth and price growth for REIT properties were markedly higher than for non-REIT properties in 1997 and 1998. This would seem to support the popular impression that REIT ownership led to better property management. It is not clear, however, if REIT management per se caused this difference or if REITs simply acquired properties with improving performances. To help address this question, the bottom panel of Table 4 groups hotels by whether or not they were ever owned by a REIT. The data in the bottom panel suggest that the hotels acquired by REITs tended to be hotels whose performances were improving. In particular, these hotels had REVPAR growth and average price growth that were consistently higher than other hotels throughout the sample period. We more formally address the effect of REIT ownership on property performance in the following section.

## 3. Empirical specification and results

### *3.1. Specification*

To isolate the effect of REIT ownership on property performance, we look at the determinants of our four performance measures in a multivariate framework. A REIT indicator variable is set equal to one if a REIT owns a property in a given year, and is equal to zero otherwise.[24] Because revenue growth is heavily influenced by changes in capacity, both the growth rate in the number of rooms and the growth rate in days open are included as independent variables. Although REVPAR, occupancy and price measures control for capacity, the growth rates for rooms and days open are included in these specifications because changes in capacity may have more than an arithmetic effect on performance; that is, changes in capacity may proxy for other changes, such as the remodeling of a property or restructuring of management, that may affect performance. A measure of idle capacity, defined as 100 minus 1-year lagged occupancy rate, is included in all specifications because it may be much more difficult to improve the performance of a property with, say, 20 percent idle capacity than one with 80 percent idle capacity.

Change in brand affiliation may affect property performance, so three dummy variables indicating brand change are included as independent variables. The first equals one if the property changed from a brand-affiliated property in the previous year to an independent property in the current year, and equals zero otherwise. Similarly, a dummy variable is included that equals one if the property changed from an independent property in the previous year to a brand-affiliated property in the current year, and equals zero otherwise. The third dummy variable equals one if the property changed from one brand affiliation in the previous year to a new brand affiliation in the current year, and equals zero otherwise.

We also wish to control for local economic conditions. To capture the full dynamics of the economic cycle, which can vary across time and geography, we interact the MSA and year dummies creating separate MSA-year effects.

To control for differences in the performance of hotels that are in different segments of the market we include segment effects. Because the segment effects are not allowed to vary over time, we are assuming that these differences are relatively long term in that they persist for the entire time period of our sample. The differences could be due to changes in relative demand or supply. For example, during long periods of economic expansion, like the period covered by our data, demand for more luxurious accommodations may increase. Alternatively, supply in some segments could be characterized by over capacity, and it may take a long period of time to absorb that capacity. Although we would like to control for segment effects, it is possible that REIT ownership in itself could affect the performance of all properties in a market. Specifically, if ownership became more concentrated, REITs could exert market power. For example, if the REITs facilitate greater collusion, this will positively affect the performance of the other properties in a relevant market. We define the relevant market as hotels within an MSA that are in the same market segment. While this effect is likely to be minimal based on the limited number of properties owned by REITs, especially in the early 1990s, we test this

hypothesis by including in some specifications the fraction of the total capacity in the MSA-segment owned by REITs.

In all specifications, we use least-squares estimation to derive consistent estimates of the parameters. We also present robust standard errors that allow for arbitrary heteroscedasticity and correlation within properties across years. Means and standard deviations for dependent and independent variables are presented in the appendix.

## *3.2. Results*

### ***3.2.1. REIT indicator variable and REIT market share variable***

The results of the estimation are presented in Table 5. The estimates from the revenue growth model with no segment effects are presented in column 1. Controlling for other factors, REIT ownership is estimated to increase revenue growth by nearly 10 percentage points. This effect is both economically substantial, as mean revenue growth for the sample is 14 percent, and statistically significant. However, when controls are added for the segment that a hotel is in (column 2), the effect of REIT ownership is only one-tenth as large and is no longer statistically significant. While the effect of REIT ownership is somewhat larger when the fraction of capacity owned by REITs is also included as an independent variable (column 3), it is still less than half as large compared to when segment effects are not included and it is not statistically significant.

Results for REVPAR and occupancy growth reveal a similar pattern. In the specification without segment effects (column 4), REIT ownership is estimated to increase REVPAR by nearly 9 percentage points, and the coefficient estimate is statistically significant. When segment effects are included (column 5), the effect is about one-third as large, and is statistically insignificant. The effect is even smaller when the fraction of capacity owned by REITs is included (column 6). The effect of REIT ownership on occupancy growth is also large and statistically significant in the specification without segment effects (column 7), but the effect is much smaller and statistically insignificant in both specifications containing segment effects (columns 8 and 9). REIT ownership does not have any discernable affect on price growth at the hotels.

If REIT ownership positively affects properties in the same MSA-segment (perhaps by decreasing the level of competition), then increasing the capacity owned by REITs should improve the performance of all properties in the MSA-segment. The coefficient estimates associated with the fraction of capacity owned by REITs are close to zero and statistically insignificant for all four performance measures. This suggests that REIT market presence has a negligible affect on the performance of other similar properties in the MSA.

### ***3.2.2. Other variables***

Both the percent growth in rooms and the percent growth in days are positively related to revenue growth. Because the coefficients on both measures are greater than one, capacity

*Table 5*. The effect of REIT ownership on performance measures.

| | Dependent Variable | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Revenue (percent growth) | | | REVPAR (percent growth) | | | Occupancy (percent growth) | | | Price (percent growth) | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| REIT indicator variable | 9.73** | 1.17 | 4.09 | 8.76* | 3.15 | 2.81 | 6.75** | 1.43 | 1.22 | 0.17 | 0.09 | −0.25 |
| | (2.57) | (2.89) | (3.58) | (3.57) | (3.53) | (3.99) | (1.44) | (1.47) | (1.66) | (0.73) | (0.73) | (0.81) |
| Growth rate in rooms | 1.37** | 1.37** | 1.37** | −0.09** | −0.09* | −0.09* | −0.09* | −0.09* | −0.09* | 0.00 | 0.00 | 0.00 |
| | (0.35) | (0.35) | (0.35) | (0.03) | (0.03) | (0.03) | (0.04) | (0.04) | (0.04) | (0.01) | (0.01) | (0.01) |
| Growth rate in days open | 1.58** | 1.57** | 1.57** | 0.04** | 0.04** | 0.04** | 0.03** | 0.03** | 0.03** | 0.01** | 0.01** | 0.01** |
| | (0.09) | (0.09) | (0.09) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.003) | (0.003) | (0.003) |
| Idle capacity in prior year | 0.55** | 0.81** | 0.81** | 0.46** | 0.62** | 0.62** | 0.53** | 0.68** | 0.68** | −0.09** | −0.08** | −0.08** |
| | (0.05) | (0.07) | (0.07) | (0.03) | (0.04) | (0.04) | (0.03) | (0.03) | (0.03) | (0.01) | (0.01) | (0.01) |
| Changed from brand to independent | −11.46** | −5.90** | −6.00** | −12.29** | −9.05** | −9.04** | −10.56** | −7.56** | −7.55** | −1.94** | −1.85** | −1.84** |
| | (2.23) | (2.26) | (2.26) | (2.09) | (2.08) | (2.08) | (1.88) | (1.88) | (1.88) | (0.70) | (0.71) | (0.70) |
| Changed from independent to brand | 11.48** | 3.28 | 3.30 | 9.46** | 4.80* | 4.80* | 3.49* | −0.84 | −0.84 | 4.51** | 4.41** | 4.41** |
| | (2.59) | (2.72) | (2.72) | (2.47) | (2.45) | (2.45) | (1.62) | (1.63) | (1.63) | (0.80) | (0.80) | (0.80) |
| Changed brand affiliation | 1.88 | −6.24* | −6.25* | 1.47 | −2.98 | −2.98 | −0.62 | −4.75** | −4.75** | 0.64 | 0.53 | 0.53 |
| | (2.47) | (2.62) | (2.62) | (2.63) | (2.62) | (2.62) | (1.31) | (1.35) | (1.35) | (0.66) | (0.65) | (0.65) |
| Fraction of MSA-segment | | | −0.15 | | | 0.02 | | | 0.01 | | | 0.02 |
| Capacity owned by REITs | | | (0.10) | | | (0.03) | | | (0.02) | | | (0.01) |
| MSA-year effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Segment effects | No | Yes | Yes | No | Yes | Yes | No | Yes | Yes | No | Yes | Yes |
| *R*-squared | 0.78 | 0.78 | 0.78 | 0.10 | 0.12 | 0.12 | 0.12 | 0.15 | 0.15 | 0.13 | 0.13 | 0.13 |
| Observations | 18,577 | 18,577 | 18,577 | 18,577 | 18,577 | 18,577 | 18,573 | 18,573 | 18,573 | 18,573 | 18,573 | 18,573 |

The standard errors in parentheses are robust to arbitrary heteroscedasticity and correlation within properties across years.
* Statistically significant at the 0.05 level. ** Statistically significant at the 0.01 level.

growth does not have a simple arithmetic affect on revenue. It is likely that a change in the number of rooms is either due to a new hotel that is opened in stages, or the renovation of an old hotel. Similarly, a change in number of days open may be due to a new hotel being open only part of the year, or a hotel shutting down part of a year for renovation. In either case, the performance of the hotel may improve once construction is completed and the hotel becomes fully operational over time.

The effect of room growth on REVPAR is negative and statistically significant. A doubling in number of rooms would lead to a 9 percent decline in REVPAR. The negative effect of number of rooms on REVPAR appears to work through a decline in the occupancy rate, as the effect on room price is negligible. This suggests that new capacity is not absorbed completely in the first year. Growth in days open has a statistically significant positive affect on REVPAR. A doubling in days open increases REVPAR by 4 percent. The positive affect of days open on REVPAR is due to increases in both occupancy and price. The coefficient estimates associated with room growth and days open growth are robust to the inclusion of segment effects and REIT market concentration.

Lagged unused capacity has a positive affect on revenue growth; hotels with substantial idle capacity tend to increase revenue more quickly. Lagged unused capacity also leads to higher REVPAR growth, which is achieved through higher occupancy growth rates and slightly lower price growth rates. The estimated effect of lagged unused capacity on revenue, REVPAR and occupancy growth is higher in specifications that include segment effects, while its estimated effect on price growth does not change appreciably when segment effects or REIT market concentration are included.

Brand affiliation changes have significant effects on hotel performance in most specifications. Changing from being a brand-affiliated hotel to being an independent hotel has a negative effect on all performance measures, although the estimated effect is smaller when segment effects are included. Conversely, changing from independent to brand-affiliated is associated with positive effects on performance, although the effects on revenue growth and occupancy growth are statistically insignificant when segment effects are included. In most specifications changing brands has no statistically significant effect on performance, but it is associated with a decline in revenue growth and occupancy growth if segment effects are included.

#### *3.2.3. Sensitivity tests*

To test the robustness of our results, several alternative regression specifications were tested. First, REIT hotels are brand affiliated and tend to be concentrated in midscale and high-end market segments. Although we control for market segment, it is possible that the effect of REIT ownership varies across market segment, or that the relative performance of market segments varies over time. To see if this affects our results, we ran the regressions for only brand-affiliated hotels, and for midscale and high-end hotels separately. In all cases the results did not change appreciably. Second, to see if the type of REIT mattered, we restricted the REIT indicator variable to represent only stapled and paper clip REITs, and then restricted the REIT indicator variable to represent only traditional REITs. In both

cases, the coefficient on the REIT indicator variable was not significantly different than zero in the fully specified models. It could also be argued that because we are controlling for brand changes and slack, we have eliminated the effects of two strategies REITs use to increase the performance of newly acquired properties: repositioning the property by changing brands or opportunistically buying underutilized properties. However, the coefficients associated with the REIT indicator variable remain insignificant in the fully specified models even if the indicator variable for a brand change or the measure of slack is removed from the specifications. In addition, removing the growth rates for rooms and days open does not appreciably affect the REIT coefficient estimates in models of REVPAR, occupancy and price growth.

### *3.2.4. Discussion of results*

The fact that REIT-owned hotels tend to perform better than other hotels would support the anecdotes that suggest that REITs are better property managers. However, because these effects largely disappear when segment effects are included, the better performance by REIT properties appears to be the result of REITs investing in segments that performed well over this period. The fact that similar results are obtained when the fraction of capacity owned by REITs is included in the specification indicates that the superior performance of these segments is not attributable to the REITs. While our results may suggest that REITs are savvy purchasers of properties (depending on the purchase price of the property), our results do not support the view that REIT-owned properties perform better than other properties in the same segment or that REITs decrease the level of competition in local markets.

A few caveats are in order. Our performance indicators measure revenue and not profits. It may be that REITs have lower costs due to superior management or economies of scale. Because we do not have data on costs, we cannot test this hypothesis. Also, while it may be that the performance of REIT properties does not appreciably differ from other comparable properties, specific REITs may have exceptional performance. Finally, our results are not likely to capture the long-run effects on the lodging industry of property acquisitions by REITs since the large majority of these acquisitions occurred in the last two years of our data. It may be, for example, that REIT market concentration will eventually change the dynamics of local real estate markets.

## 4. Conclusion

One of the most striking developments in the commercial real estate market in the past decade has been the transfer of large amounts of property from largely private

ownership to ownership by publicly traded REITs. The full significance of this shift in ownership is not well understood. Possible effects of the emergence of publicly traded real estate range from greater economies of scale in the production of real estate services to attenuation of the real estate cycle through public-market oversight. This paper investigates two hypotheses: that REIT-owned properties perform differently than other properties and that the concentration of real estate ownership brought about by REITs has increased the market power of real estate owners.

Our results suggest that, compared to all other hotels, REIT hotels tend to have higher revenue growth, higher REVPAR growth and higher occupancy-rate growth. However, this result appears to be due to the type of hotels that REITs own: REITs tend to own mid-scale or high-end hotels and these types of hotels have performed well in recent years. Once the market segments of the hotels are controlled for, REITs do not perform significantly better than other properties. This suggests that REITs tended to acquire properties that perform well, but REIT ownership in itself does not appear to have increased performance. We also find that the superior performance of the market segments in which REITs have a significant presence is not attributable to the market power of the REITs.

## Appendix

*Segment classifications of brands*

*Deluxe:* Fairmont, Four Seasons, Westin

*Luxury:* Hyatt, Marriott, Sheraton, Renaissance, Omni, Loews, Bristol, Stouffer

*Upscale:* Crowne Plaza, Adam's Mark, Hilton, Radisson, Red Lion, DoubleTree, Courtyard, Wyndham

*Midscale with Food & Beverage:* Holiday, Holiday Select, Ramada, Clarion, Four Points, Howard Johnson

*Midscale without Food & Beverage:* Hampton, Country, LaQuinta, Wingate, Holiday Express, Homeplace, Fairfield, Drury

*Economy:* Days, Comfort, Ramada Ltd, Best Western, Quality, Shoney's, Sleep, Budgetel

*Budget:* Motel 6, Travelodge, Super 8, Friendship, Red Roof, Rodeway, Microtel, Econolodge, Travelers, Park, Red Carpet, Allstar, Exel, Homestead

*Upper-Tier Extended Stay:* Residence, Hawthorn, Homewood, Embassy, DoubleTree Suites, Summerfield, Sheraton Suites, Sumner Suites

*Lower-Tier Extended Stay:* MainStay, AmeriSuites, Comfort Suites, HomeGate, StudioPlus, Travel Suites, Westar, Lexington, Extended Stay America, Villager

*Table A1*. Descriptive statistics.

| Variable | *N* | Mean | Std. Dev. |
|---|---|---|---|
| Revenue growth | 18,577 | 14.22 | 109.81 |
| REVPAR growth | 18,577 | 3.77 | 28.98 |
| Occupancy growth | 18,573 | 2.50 | 26.10 |
| Price growth | 18,573 | 1.14 | 7.65 |
| REIT indicator variable | 18,577 | 0.01 | 0.11 |
| Brand to independent indicator variable | 18,577 | 0.01 | 0.09 |
| Brand affiliation change indicator variable | 18,577 | 0.02 | 0.12 |
| Independent to brand indicator variable | 18,577 | 0.02 | 0.12 |
| Growth rate in rooms | 18,577 | 1.19 | 19.57 |
| Growth rate in days open | 18,577 | 6.87 | 57.25 |
| Idle capacity | 18,577 | 46.21 | 15.21 |
| Fraction of MSA-segment capacity owned by REITs | 18,577 | 1.28 | 5.98 |

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## Notes

1. In order to receive favorable tax treatment, REITs are required to distribute to shareholders 90 percent of taxable income, giving them limited ability to use retained earnings for property acquisition and development. Gyourko and Sinai (1999) estimate the net tax benefit of the REIT structure is equal to 2–5 percent of industry market capitalization. Since real estate owned by individuals or partnerships is also not taxed at the corporate level, the REIT structure has no tax advantage relative to private unincorporated holdings.
2. See NAREIT™ Real-Time Market Index. Most recent value is for January 1, 2002.
3. Latest statistics are as from first-quarter 2002 REIT filings. Historical data on assets based on 1998 NAREIT Statistical Digest.
4. See Prudential Real Estate Investors (2001). For each major property type Prudential estimates the REIT-owned share of the ''institutional quality investable universe.'' They estimate that at the end of 2000, REITs owned 6.9 percent of hotel properties as well as 7.4 percent of apartments, 8.6 percent of warehouses, 6.5 percent of offices, 12.7 percent of non-mall retail and 33.2 percent of mall retail properties. Publicly traded real estate operating companies (REOCs) owned another 10.4 percent of hotel properties. Note that these are national market shares and that market shares in major metropolitan areas are likely to be higher.
5. ''The New World of Real Estate,'' *Business Week* September 23, 1997.
6. ''Hot Property: How to Play the REIT Boom,'' *Fortune* October 23, 1997.
7. ''Targeted Tenants: Apartment Complexes Fall Into New Hands, And Up Go the Rents'' *Wall Street Journal*, March 25, 1997.

8. There are currently 42 REITs with market capitalization over $1 billion and eleven REITs with market capitalization over $3 billion. See Demsetz and Lehn (1985) for a discussion of the forces that determine the structure of corporate ownership, including the cost of capital. For additional discussion, see Demsetz (1983) and Fama and Jensen (1983).
9. REITs typically specialize in one type of property (e.g. office, industrial, retail or residential) and tend to concentrate in geographic areas. See Dinsmore (1998) for a discussion of REITs' pursuit of market dominance.
10. See Anderson et al. (2001) for a discussion of the literature on the economies of scale in real estate.
11. Previous building booms have been attributed to the loosening of credit terms by banks and overbuilding by private developers. See Mei and Saunders (1997) for a discussion.
12. See Vettas (1998) for a model of demand and supply where firms and consumers learn by observing the behavior of other firms and consumers.
13. Because of a tax law change, REITs are allowed to have taxable subsidiaries actively manage their properties for tax years that begin after December 31, 2000.
14. Starwood Lodging and Patriot American Hospitality used grandfathered stapled REIT structures to own and operate hotels.
15. As we discuss, analyzing the two types of REITs separately does not affect our conclusions.
16. While brand affiliation can often be determined from information on the tax return, in some cases the determination is difficult. Because of this, the brand affiliations identified by SSI were sometimes incorrect. These brand affiliation mistakes were identified and corrected based on subsequent years SSI reports, tax information, a phone survey, and hotel listings in the Directory of Hotel and Motel Companies.
17. Each brand's segment classification is identified in the appendix.
18. The directory did not identify acquisition dates for some properties owned by REITs. These acquisition dates were obtained by either contacting the REIT or consulting the REIT's 10 K reports filed with the U.S. Securities and Exchange Commission.
19. Properties are classified as owned by a REIT if the REIT owned the property for at least 6 months in the given year. Therefore, a property acquired by a REIT in March of 1997 is identified as a REIT property in 1997 and 1998 while a property acquired in September of 1997 is identified as a REIT property only in 1998.
20. REITs own lodging properties in Addison, Amarillo, Arlington, Austin, College Station, Corpus Christi, Dallas, El Paso, Forth Worth, Garland, Houston, Irving, Kerrville, Laredo, Midland, Plano, Richardson, San Angelo, San Antonio and Tyler.
21. These 91 hotels are owned by 13 different REITs: American General Hospitality Corp., CapStar Hotel Company, Crescent Real Estate, Equity Inns Inc., Felcor Suite Hotels Inc., Glenboro Realty Trust, Hospitality Properties Trust, Innkeepers USA Trust, Patriot American Hospitality, RFS Hotel Investors Inc., Starwood Lodging Trust, Sunstone Hotel Investors Inc. and Winston Hotels. Together, the two stapled REITS, Starwood Lodging Trust and Patriot American Hospitality, and the one paper-clipped REIT, Crescent Real Estate, owned 27 hotels representing 64 property-year observations.
22. All appropriate numbers are in 1996 dollars.
23. Admittedly, this is not an exhaustive list of performance measures. In particular, effective property management involves both the ability to increase revenues and the ability to control costs. Unfortunately, we do not have property level information on costs.
24. See note 19.

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