Ownership Structure, Property Performance, Multifamily Properties, and REITs

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Abstract

This research extends literature that empirically evaluates the impact of ownership and management structure on property level performance. The results show that multifamily properties owned and managed by real estate investment trusts (REITs) generate higher effective rents at the property level than non-REIT-owned properties. After controlling for positive operating scale and brand effects, REIT property level performance is better than non-REIT property level performance in the market studied. The REIT structure represents diversified scale operators with property management skills. The results imply that the structure of property ownership can impact property performance.

Current studies postulate that property ownership and management structure impact real property investment performance. Operating revenues, cash flows, and appreciation returns are thought to be affected by the management ability and the acquisition and disposition tactics employed by a property's owner. This research deviates from the historical view that each property is a unique, stand-alone asset with little direct benefit associated with ownership or management structure. The prior construct may not remain uniformly valid given the tremendous growth in large, integrated, scale owners and managers. Many studies document the benefits associated with property portfolio diversification, especially by geography and property type, and the implied scale economies that support a real estate investment trust's (REIT's), or any large diversified investor's, ability to generate a higher return with reduced portfolio level risk. Few studies, however, focus on the impact of ownership structure and investor clienteles at the property level.

Benjamin, Chinloy, and Hardin (2006) document the positive impact associated with the use of a branding strategy at the property level. This strategy requires management of real property assets in a long-term, coordinated manner. The cost of branding must be offset by gains over an entire portfolio and the ownership structure must be sufficiently broad and over a sufficient duration to capture these gains. Such a strategy is not consistent with a property trading, short-term

investment orientation, but instead requires a long-term investment horizon. In a concurrent study, Benjamin, Chinloy, and Hardin (2007) show that operational scale is a significant determinant of effective rents. Scale operators in a specific market can generate higher effective rents at the property level. These operators are better able to obtain market information and to signal property quality. In a study focused on REIT-owned lodging properties, Brady and Conlin (2004), however, find little or no support for the argument that the REIT ownership structure alone increases property performance. For lodging properties, property type and quality represented by hotel flag, or brand, have a greater influence on performance than REIT ownership. While not supportive of the REIT managerial effectiveness argument, Brady and Conlin do show that property performance is related to the quality of a lodging property, which can be signaled by its flag or brand. It remains difficult to refute that ownership, management, and marketing structure can at times impact property performance as measured by revenue and costs at the property level.

The present research expands this growing literature by evaluating the performance of REIT-owned multifamily properties. Motels and hotels are typically managed by true third party management firms and are supported by coordinated marketing efforts under a brand or flag. Multifamily properties are primarily marketed within a single market and branding is not the predominant strategy. The paper directly extends Brady and Conlin's (2004) investigation of the performance of REIT-owned lodging properties to an additional property type. Concurrently, existing studies focused on ownership characteristics, operating performance, and portfolio construction are broadened by providing empirical justification for a willingness by certain investor clienteles to pay premiums for property acquisitions. By generating greater property-level revenue, investors with operating skills can generate equivalent returns despite payment of an acquisition premium.

The study findings indicate that REIT-owned apartment properties in the Atlanta market generate higher effective rents than comparable non-REIT-owned properties for the period studied. Even after controlling for operational scale, branding, and property characteristics, REIT-owned properties perform better at the property level in this market. Given an assumption that REIT managers in aggregate acquire real estate skills and own large geographically diversified portfolios, the findings confirm expectations of a maturing industry. The study also provides a partial explanation for the REIT acquisition premium shown in prior literature and highlights the importance of investor clienteles in the management and ownership of income-producing real property. The need to continue to expand existing research on the determinants of operating level performance to property ownership and management characteristics is manifested. Data and analysis from additional property types and geographical areas are still needed to identify whether the results are applicable across real estate markets.

The Relevant Literature

Two current areas of the literature are relevant. Research has documented clientele and ownership characteristics that impact property acquisition price. Concomitant

research has also documented that property operating performance can be impacted by owners, managers, and investment strategies. This study links property acquisition research showing that REITs have, at times, paid premiums for property acquisitions with literature showing that ownership characteristics can influence property operating performance. The willingness and ability to pay a property acquisition premium implies either a lower cost of total capital, the ability to better manage real property assets, or some combination of these two factors.

Participant characteristics and investor clienteles have been shown to impact real estate transaction prices. In residential real estate, numerous studies indicate that individual participant characteristics affect transaction price. For example, Harding, Rosenthal, and Sirmans (2003) investigate bargaining power and determine that both first-time home buyers and search-constrained home buyers pay higher prices. Zumpano, Elder, and Baryla (1996) show that residential buyers with low opportunity costs and limited market knowledge have prolonged property searches. Jud and Frew (1986) and Turnbull and Sirmans (1993) investigate local and non-local participants in the residential markets with mixed results. Non-local residential buyers will, on occasion, pay property acquisition premiums. In the residential property market, transaction party groups have been shown to impact transaction price.[1]

Contemporaneous with these studies is research evaluating investor clienteles and commercial real estate. In a study of office property transactions, Colwell and Munneke (2006) show that buyers working with banks often pay more for office properties and sell these properties for less than other market participants. They postulate that bargaining strength impacts transaction price. With respect to REIT participation in commercial real estate transactions, Hardin and Wolverton (1996) and Lambson, McQueen, and Slade (2004) provide evidence that apartment REITs can affect transaction prices. Hardin and Wolverton find that REITs at times pay a premium for acquisitions in some markets, including Atlanta and Phoenix, but not in all markets. A willingness on the part of REITs to pay premiums is attributed to capital market conditions at the time of the study, to differences in capital costs between buyers, and to scale economies for REITs. Lambson, McQueen, and Slade show that non-local buyers pay more than locals and that REITs paid a purchase premium in the Phoenix market during the period investigated. The behavior of non-local buyers is explained by limited effective search and bias associated with the anchoring heuristic. An alternative explanation could be that local buyers need to be compensated for holding an undiversified portfolio. Benjamin, Chinloy, Hardin, and Wu (2008) investigate investor clienteles and show that condo converters can lead an upward trend in apartment pricing while paying premiums over investors acquiring property for cash flow. In all cases, identifiable commercial market participants, or clienteles, affect transaction prices.

Additional research shows that ownership structure and strategy affect property level operating performance measured by operating costs and revenues. In a study of the operating performance of lodging properties owned by REITs, Brady and Conlin (2004) show that REIT ownership in isolation does not positively impact

operating performance. After controlling for flag or brand, lodging type, and location, REIT-owned property performance is undifferentiated when compared with non-REIT-owned property performance. Benjamin, Chinloy, and Hardin (2006) investigate the ability of property owners to brand their properties and earn higher operating results. Scale operators with local management are more likely to employ the branding strategy and generate excess property returns as measured by effective gross rental income. The implication is that ownership strategy, as evidenced by branding, impacts operating results. In a subsequent study focused on scale and institutional ownership, Benjamin, Chinloy, and Hardin (2007) show that operators with local management and scale in a specific market can generate improved operating performance. These studies support the general argument that ownership characteristics affect actual property performance.

In the present study, the REIT form of ownership is evaluated in the context of improved property operating performance. The study extends the ownership-clientele research stream by quantifying an operating benefit that might induce an investor group to pay an acquisition premium and to show that economies of scale, as proposed by Ambrose, Linneman, and Highfield (2005), which are most often associated with cost savings, may also be associated with enhanced rents and income. This implies both top line and bottom line improvements to investment returns at the operating level based on ownership structure.

Model Specification and Data

Benjamin, Chinloy, and Hardin (2007) propose a property rent and occupancy model that is based on both hedonic property characteristics and property owner characteristics. Rent and occupancy are a function of more than simple hedonic characteristics. Properties owned by differentiated investor and owner clienteles can be modeled in a multivariate format using both hedonic and property ownership characteristics. Accordingly, two models are employed. Similar to Benjamin, Chinloy, and Hardin (2006, 2007), the first model is a probit model with classification as a REIT property being the dependent variable of interest. The general form of the model is:

$$P^{REIT} = f(\mathbf{o}, \boldsymbol{\chi}, \boldsymbol{\psi}), \tag{1}$$

where P^{REIT} is a dichotomous variable for the classification of a property as a REIT-owned property, $\mathbf{o}$ is a vector of ownership and management variables, $\boldsymbol{\chi}$ is a vector of hedonic property characteristic variables, and $\boldsymbol{\psi}$ is a vector of location and time control variables. The second model is also similar to those employed by Benjamin, Chinloy, and Hardin (2006, 2007) where the dependent variables are occupancy rate and the natural log of rent. Given that the residuals from the last equation are likely to be contemporaneously correlated, these equations are evaluated using the seemingly unrelated regression (SUR) methodology. The

models of occupancy and vacancy are similar to Equation 1 and are represented in the equations that follow:

$$Rent = f(\rho, \mathbf{o}, \boldsymbol{\chi}, \boldsymbol{\psi}), \text{ and} \quad (2)$$

$$Occ = f(\rho, \mathbf{o}, \boldsymbol{\chi}, \boldsymbol{\psi}) \quad (3)$$

where *Rent* is the log of per unit rent, *Occ* is the multifamily complex occupancy rate, **o** is a vector of ownership and management variables, $\boldsymbol{\chi}$ is a vector of hedonic property characteristic variables, and $\boldsymbol{\psi}$ is a vector of location and time control variables. Additionally, based on the results from the estimated probit models, inverse Mill's ratios are calculated and are used to control for possible endogeneity of the REIT variable.[2]

The data used in the models are generated from apartment rental data provided by Databank, Inc. In order to be included in the analysis, a property must have a minimum of 150 units. This restricts the sample to properties that are sufficiently large to attract institutional and other large investors. Pooled longitudinal data for twenty quarters ending with March, 2001 on 470 properties forms the basis of the evaluation. The data include property characteristics, rental information, occupancy rate, ownership, and location attributes. Atlanta is regarded as a top-tier investment market for both institutional and non-institutional investors.

Empirical Results

Exhibit 1 provides descriptive statistics for the complete sample while Exhibit 2 disaggregates the data into REIT and non-REIT properties and provides comparisons. Exhibit 1 shows little evidence that amenities differs by unit property type.[3] The majority of properties have pools, fitness centers, and social facilities. About half have playgrounds and about 25% have business centers. A smaller percentage of properties have controlled access and covered parking. The occupancy rate across unit types is undifferentiated and there is little difference in the location and age variables. The ownership and management structure variables are also similar across the property unit types. As expected, the size and rent variables increase monotonically from the one-bedroom to the two-bedroom and three-bedroom units.

Exhibit 2 provides summary descriptive statistics disaggregated by REIT and non-REIT ownership status with statistical comparisons. The REIT-owned properties generate greater rents than non-REIT properties across all unit types. The differences in rents are statistically significant at the 1% level. Occupancy rates are also statistically significant (at the 1% level) and higher for REIT-owned properties, although the differences appear to have little practical effect. The REIT-owned properties are larger and newer as evidenced by the age and number of

Exhibit 1 | Descriptive Statistics

	One-Bedroom Units		Two-Bedroom Units		Three-Bedroom Units	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
REIT	21.469	41.064	22.380	41.683	20.128	40.101
Unit Rents (dollars)	607.533	122.475	728.565	161.520	865.475	243.946
Occupancy Rate	95.331	5.112	95.274	5.153	94.918	5.678
Branded	16.186	36.836	15.458	36.154	12.125	32.646
Age (years)	17.679	8.814	17.963	8.808	19.339	9.347
Number of Units in Complex	321.460	163.229	311.649	140.398	310.086	133.435
Average Size of Unit (sq. feet)	783.664	97.109	1,110.250	129.063	1,373.490	170.888
Local Control	53.222	49.901	52.481	49.943	55.166	49.739
Number Controlled	7.485	8.341	7.189	8.062	6.952	7.626
Local Management	81.248	39.037	80.309	39.770	84.020	36.647
Number Managed	11.138	10.385	10.856	10.255	10.232	9.796
Latitude	33.872	11.892	33.870	0.121	33.866	0.121
Longitude	−84.357	0.139	−84.354	13.686	−84.363	13.598
Pool	96.347	18.762	96.600	18.126	96.092	19.381
Covered Parking	14.444	35.156	13.844	34.540	12.286	32.832
Laundry	90.764	28.956	90.267	29.643	92.184	26.846
Fitness Center	62.439	48.433	61.225	48.728	59.690	49.059
Social Facility	69.408	46.084	69.205	46.168	67.532	46.832
Business Center	23.998	42.711	24.410	42.959	22.377	41.682

Exhibit 1 | (continued)
Descriptive Statistics

	One-Bedroom Units		Two-Bedroom Units		Three-Bedroom Units	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Playground	47.414	49.938	47.935	49.962	50.990	49.997
Gated/Controlled Access	19.820	39.868	19.500	39.624	17.077	37.636
In-Unit Alarms	14.331	35.042	14.503	35.217	12.259	32.801
Both Security Measures	18.247	38.626	18.373	38.729	16.783	37.376

Notes: Exhibit 1 displays the descriptive statistics for the present analysis once the sample is differentiated by property unit type. The apartment unit type samples are derived from 470 apartment complexes of more than 150 units in the Atlanta MSA. There are 20 quarters of data. The last quarter of data is from the first quarter of 2001. *REIT*, *Branded*, *Local Control*, *Local Management*, *Pool*, *Covered Parking*, *Laundry*, *Fitness Center*, *Social Facility*, *Business Center*, *Playground*, *Gated/Controlled Access*, *In-Unit Alarms*, and *Both Security Measures* are indicator variables equaling one if the apartment unit has the given characteristic, otherwise zero. The aforementioned variables plus *Occupancy Rate* are reported in percentage form. The units for the remaining variables are listed in the exhibit. $N = 5{,}338$ for one-bedroom units; $N = 5{,}764$ for two-bedroom units; and $N = 3{,}736$ for three-bedroom units.

Exhibit 2 | A Comparison of REIT and Non-REIT Properties

	One-Bedroom Units			Two-Bedroom Units			Three-Bedroom Units		
Variable	REIT	Non-REIT	*t*-stat.	REIT	Non-REIT	*t*-stat.	REIT	Non-REIT	*t*-stat.
Unit Rents (dollars)	677.706	588.350	21.96***	845.860	694.745	27.43***	1,070.160	813.892	19.85***
Occupancy Rate	95.734	95.221	3.66***	95.749	95.137	4.59***	95.508	94.770	3.77***
Branded	41.710	9.208	21.33***	40.310	8.292	22.44***	39.495	5.228	18.73***
Age (years)	13.271	18.884	−23.10***	13.492	19.252	−24.89***	13.487	20.814	−20.87***
# of Units in Complex	374.201	307.041	9.88***	351.551	300.143	11.36***	348.491	300.407	8.27***
Ave. Unit Size (sq. ft.)	771.313	787.041	−6.35***	1,129.980	1,104.570	7.08***	1,359.620	1,376.990	−2.66***
Local Control	62.478	50.692	7.12***	59.612	50.425	5.84***	61.303	53.619	3.79***
Number Controlled	16.517	5.016	34.82***	15.995	4.650	36.44***	15.423	4.817	25.94***
Local Management	73.037	83.492	−7.30***	71.783	82.767	−7.99***	77.260	85.724	−5.10***
Number Managed	17.478	9.404	20.94	17.162	9.037	22.20***	17.041	8.516	17.88***
Latitude	33.895	33.866	8.89***	33.895	33.862	10.24***	33.892	33.859	8.12***
Longitude	−84.354	−84.358	0.94	−84.351	−84.355	1.08	−84.373	−84.361	−2.26**
Pool	97.295	96.088	2.14**	97.442	96.357	2.08**	97.473	95.744	2.54**
Covered Parking	25.654	11.379	10.34***	26.357	10.237	12.32***	26.330	8.747	10.41***
Laundry	94.590	89.719	5.96***	93.178	89.428	4.47***	98.936	90.483	12.91***
Fitness Center	68.150	60.879	4.51***	69.070	58.963	6.82***	73.138	56.300	9.08***
Social Facility	68.499	69.656	−0.75	69.225	69.200	0.02	71.277	66.588	2.46**
Business Center	22.339	24.451	−1.48	24.031	24.519	−0.36	15.957	23.995	−5.19***
Playground	33.595	51.193	−11.03***	34.031	51.945	−11.81***	31.383	55.932	−12.77***

Exhibit 2 | (continued)

A Comparison of REIT and Non-REIT Properties

	One-Bedroom Units			Two-Bedroom Units			Three-Bedroom Units		
Variable	REIT	Non-REIT	*t*-stat.	REIT	Non-REIT	*t*-stat.	REIT	Non-REIT	*t*-stat.
Gated/Controlled Access	25.218	18.344	4.86***	26.279	17.546	6.46***	21.010	16.086	3.02***
In-Unit Alarms	10.820	15.291	−4.17***	11.938	15.244	−3.15***	12.367	12.232	0.10
Both Security Measures	21.204	17.438	2.81***	21.240	17.546	2.90***	27.527	14.075	7.69***
# of Observations	1,146	4,192		1,290	4,474		752	2,984	

Notes: Exhibit 2 displays the summary statistics once the sample is differentiated by REIT and Non-REIT properties as well as property unit type. The apartment unit type samples are derived from 470 apartment complexes of more than 150 units in the Atlanta MSA. There are twenty quarters of data. The last quarter of data is from the first quarter of 2001. *Branded*, *Local Control*, *Local Management*, *Pool*, *Covered Parking*, *Laundry*, *Fitness Center*, *Social Facility*, *Business Center*, *Playground*, *Gated/Controlled Access*, *In-Unit Alarms*, and *Both Security Measures* are indicator variables equaling one if the apartment unit has the given characteristic, otherwise zero. The aforementioned variables plus *Occupancy Rate* are reported in percentage form. The units for the remaining variables are listed in the exhibit. *t*-statistics are for differences in means for the variables.

* Significant at the 1% level.

** Significant at the 5% level.

*** Significant at the 10% level.

units in complex variable comparisons. The unit size variables show that the REIT-owned properties have slightly smaller one-bedroom and three-bedroom units and slightly larger two bedroom units. REIT-owned properties are managed and controlled by scale operators and have a slightly smaller percentage of local management than non-REIT properties. REIT-owned properties are more likely to use a branding strategy and are also more likely to have a higher level amenity package than non-REIT properties as differences in means for the variables are statistically significant and positive. REIT-owned properties are less likely to provide playground amenities and typically offer more sophisticated access and security amenities than non-REIT properties. These relationships are formally evaluated using the probit model results presented in Exhibit 3.

Exhibit 3 provides the results from the probit model with classification as a REIT as the dependent variable. The reported Z-statistics are calculated with robust standard errors. Overall, the results are robust across the unit property type models and the three location models. The three location models include different controls for location effects. Models One, Two, and Three use longitude and latitude coordinates, county indicator variables, and sub-markets indicator variables, respectively.[4] Using a branding strategy and controlling a large number of properties are positively and statistically significantly (at the 1%, 5%, and 10% levels) associated with REIT ownership. As might be expected given that REIT headquarters are geographically disbursed and not centered in Atlanta, being locally controlled and managed is negatively related to REIT ownership at the 1% level. REIT-owned properties are newer than non-REIT properties as the age variable is negative and statistically significant at the 1% level across all models. REIT ownership is positively associated with larger apartment complexes and negatively associated with unit size. The pool amenity variable is positive and statistically significant across the one-bedroom and two-bedroom models. The playground variable is negatively signed and statistically significant at either the 5% or 1% level across the models. Similar patterns are found for the in-unit alarm and having both in-unit alarms and controlled access variables. The coefficients on the both security measure variable for each model, however, tend to be positive and statistically significant at the 1%, 5%, or 10% level. This last hedonic variable is demonstrative of an integrated security system. In the three location models, there is evidence of a spatial differentiation in the location of REIT properties. The use of the three different models using different measures of location provides robustness to the overall results. Overall, REIT-owned properties can be segmented by both organizational and hedonic characteristics.

The results for the SURs of occupancy and the per unit log of rent are provided in Exhibits 4–6. The exhibits provide the results from the three location models. The appropriateness of the SUR methodology for these data is tested using a Breusch-Pagan (1980) LM test. For the one-bedroom models in Exhibit 4, the calculated test statistic has a *p*-value of 0.0481, indicating that the SUR methodology will produce more precise estimates than that estimated by ordinary least squares.[5] The adjusted R^2 ranges from 0.645 to 0.683 for the log of rent

Exhibit 3 | Probit Model Used to Estimate Factors Associated with REIT Status

	Location Model One			Location Model Two			Location Model Three		
Variable	1 Bedroom	2 Bedroom	3 Bedroom	1 Bedroom	2 Bedroom	3 Bedroom	1 Bedroom	2 Bedroom	3 Bedroom
Intercept	−35.483**	−31.174*	−73.232***	−1.848***	−0.570**	2.363***	−2.557***	−1.033***	2.646***
Branded	0.179**	0.241***	0.501***	0.151*	0.229***	0.511***	0.176**	0.194**	0.653***
Age (years)	−0.039***	−0.043***	−0.045***	−0.043***	−0.048***	−0.055***	−0.053***	−0.060***	−0.075***
# of Units	0.001***	0.001***	−0.000*	0.001***	0.001***	−0.000	0.001***	0.001***	0.000
Ave Unit Size (sf.)	−0.001***	−0.000	−0.002***	−0.001**	−0.000	−0.002***	−0.000	0.000	−0.002***
Local Control	−0.234***	−0.357***	−0.768***	−0.207***	−0.341***	−0.774***	−0.192**	−0.376***	−0.970***
Number Controlled	0.116***	0.126***	0.120***	0.115***	0.125***	0.117***	0.113***	0.126***	0.119***
Local Management	−0.682***	−0.698***	−0.600***	−0.763***	−0.779***	−0.695***	−0.836***	−0.869***	−0.817***
Number Managed	−0.015***	−0.012***	−0.011**	−0.014***	−0.012***	−0.012**	−0.009*	−0.007	−0.007
Latitude	0.618***	0.473**	1.068***						
Longitude	−0.152	−0.173	−0.465**						
Pool	0.429***	0.436***	0.000	0.551***	0.579***	0.194	0.405***	0.484***	0.065
Covered Parking	−0.075	0.029	0.498***	−0.096	−0.004	0.440***	−0.061	−0.006	0.417***
Laundry	0.286***	0.191**	1.285***	0.261***	0.146*	1.135***	0.343***	0.125	1.152***
Fitness Center	−0.097*	−0.132**	−0.014	−0.107**	−0.139***	−0.049	−0.114**	−0.193***	−0.146*
Social Facility	−0.129**	−0.108**	−0.152**	−0.116**	−0.106**	−0.203***	−0.060	−0.020	−0.096
Business Center	−0.024	−0.071	−0.350***	−0.023	−0.069	−0.366***	−0.037	−0.068	−0.363***
Playground	−0.116**	−0.124***	−0.537***	−0.123**	−0.139***	−0.537***	−0.115**	−0.117**	−0.614***
Gated/Controlled Access	−0.334***	−0.259***	−0.221**	−0.323***	−0.264***	−0.117	−0.421***	−0.337***	−0.207*

Exhibit 3 | (continued)

Probit Model Used to Estimate Factors Associated with REIT Status

	Location Model One			Location Model Two			Location Model Three		
Variable	1 Bedroom	2 Bedroom	3 Bedroom	1 Bedroom	2 Bedroom	3 Bedroom	1 Bedroom	2 Bedroom	3 Bedroom
In-Unit Alarms	−0.144**	−0.083	0.140	−0.124*	−0.084	0.153	−0.248***	−0.110	0.320***
Both Security Measures	0.132*	0.149**	0.236***	0.123*	0.156**	0.257***	−0.044	0.039	0.223**
N	5,338	5,764	3,736	5,338	5,764	3,736	5,338	5,764	3,736
Log-Likelihood	−1,697.182	−1,823.235	−1,049.897	−1,686.763	−1,804.158	−1,036.003	−1,577.731	−1,699.102	−908.573
Psuedo R2	0.389	0.405	0.440	0.392	0.411	0.448	0.432	0.445	0.515

Notes: The dependent variable, *REIT*, is a binary variable equaling one if the firm-year observation has elected REIT status, otherwise zero. *Branded*, *Local Control*, *Local Management*, *Pool*, *Covered Parking*, *Laundry*, *Fitness Center*, *Social Facility*, *Business Center*, *Playground*, *Gated/Controlled Access*, *In-Unit Alarms*, *Both Security Measures* are indicator variables equaling one if the apartment unit has the given characteristic, otherwise zero. The units for the remaining variables are defined as before. The probit equation is estimated separately for one, two, and three bedroom units. Three models are presented: location effects controlled with *Latitude* and *Longitude;* location effects using indicator variables by county (the variables are unreported, but consistent); and, location effects using indicator variables for twenty-one submarkets (the variables are unreported, but consistent). Each model includes annual indicator variables. The Z-statistics are calculated with robust standard errors.

* Significant at the 1% level.

** Significant at the 5% level.

*** Significant at the 10% level.

Exhibit 4 | Location Model 1: SUR Results

	1 Bedroom		2 Bedroom		3 Bedroom	
	Occupancy	*Ln_Rent*	Occupancy	*Ln_Rent*	Occupancy	*Ln_Rent*
Intercept	1.151**	−5.132***	1.112**	−8.736***	−0.209	−9.034***
REIT	0.006***	0.052***	0.006***	0.057***	0.004	0.098***
Branded	0.002	0.073***	0.002	0.051***	0.003	0.086***
Age (years)	−0.000	−0.011***	−0.000***	−0.012***	−0.001***	−0.012***
# of Units (100's)	−0.003***	−0.007***	−0.003***	−0.003**	−0.005***	−0.003
Unit Size (1,000s sf)	−0.029***	0.038***	−0.031***	0.395***	−0.039***	0.154***
Local Control	−0.001	−0.061***	−0.000	−0.071***	−0.005	−0.074***
Number Controlled	−0.000	0.005***	−0.000	0.008***	0.000	0.007***
Latitude	−0.010	0.394***	−0.011*	0.407***	−0.006	0.529***
Longitude	−0.002	0.023*	−0.002	−0.014	−0.017**	0.027
Pool	0.018***	0.040***	0.017***	0.049***	0.022***	0.023*
Covered Parking	0.002	0.007	0.003	0.018***	0.006*	0.049***
Laundry	0.002	−0.022***	0.002	−0.007	0.003	0.086***
Fitness Center	0.005***	0.015***	0.000	0.018***	0.002	0.034***
Social Facility	−0.002	−0.010**	−0.000	−0.017***	−0.002	−0.026***
Business Center	−0.001	0.012***	0.000	0.003	−0.002	0.019***
Playground	0.004***	−0.029***	0.004***	−0.040***	0.002	−0.075***
Gated/Cont. Access	0.002	−0.017***	0.002	−0.014***	0.001	0.018**
In-Unit Alarms	0.001	−0.036***	0.000	−0.038***	−0.008**	−0.013

Exhibit 4 | (continued)

Location Model 1: SUR Results

	1 Bedroom		2 Bedroom		3 Bedroom	
	Occupancy	*Ln_Rent*	Occupancy	*Ln_Rent*	Occupancy	*Ln_Rent*
Both Sec. Measures	−0.001	−0.003	−0.000	−0.000	0.005*	0.019***
Inverse Mill's Ratio	−0.002	0.047***	−0.000	0.071***	0.005	0.063***
Adj. R^2	0.034	0.645	0.037	0.683	0.041	0.654

Notes: The log of rent and complex occupancy rate are the dependent variables. Each property unit type is modeled separately. The temporal quarterly dummy control variables which show an upward trend for the period are not reported. The model used to estimate the results controls for location effects using *Latitude* and *Longitude*. For the 1 Bedroom, $N = 5{,}338$; for the 2 Bedroom, $N = 5{,}764$; and for the 3 Bedroom, $N = 3{,}736$.

* Significant at the 1% level.

** Significant at the 5% level.

*** Significant at the 10% level.

Exhibit 5 | Location Model 2: SUR Results

	1 Bedroom		2 Bedroom		3 Bedroom	
	Occupancy	*Ln_Rent*	Occupancy	*Ln_Rent*	Occupancy	*Ln_Rent*
Intercept	0.969***	6.304***	0.982***	6.330***	0.999***	6.634***
REIT	0.006***	0.052***	0.007***	0.057***	0.005	0.100***
Branded	0.003	0.060***	0.002	0.043***	0.002	0.083***
Age (years)	−0.000	−0.011***	−0.000***	−0.014***	−0.001***	−0.013***
# of Units (100's)	−0.003***	−0.005***	−0.003***	−0.001	−0.005***	0.001
Unit Size (1,000s sf)	−0.035***	0.367***	−0.032***	0.372***	−0.044***	0.179***
Local Control	−0.002	−0.056***	−0.002	−0.072***	−0.007**	−0.069***
Number Controlled	0.000	0.004***	0.000	0.007***	0.001**	0.006***
Pool	0.017***	0.044***	0.015***	0.057***	0.020***	0.017
Covered Parking	0.002	0.004	0.003	0.013***	0.006*	0.036***
Laundry	0.004	−0.027***	0.004	−0.013**	0.006	0.061***
Fitness Center	0.005***	0.016***	0.003*	0.020***	0.004	0.039***
Social Facility	−0.003*	−0.010***	−0.001	−0.020***	−0.003	−0.037***
Business Center	−0.000	0.015***	0.001	0.007*	−0.002	0.022***
Playground	0.004**	−0.030***	0.004**	−0.041***	0.002	−0.063***

Exhibit 5 | (continued)

Location Model 2: SUR Results

	1 Bedroom		2 Bedroom		3 Bedroom	
	Occupancy	*Ln_Rent*	Occupancy	*Ln_Rent*	Occupancy	*Ln_Rent*
Gated/Cont. Access	0.000	−0.005	0.002	−0.008*	0.002	0.043***
In-Unit Alarms	0.000	−0.032***	0.000	−0.042***	−0.008**	−0.025***
Both Sec. Measures	−0.001	−0.005	−0.000	0.001	0.005	0.020***
Inverse Mill's Ratio	0.001	0.037***	0.001	0.066***	0.008**	0.059***
Adj. R^2	0.042	0.668	0.042	0.700	0.048	0.658

Notes: The log of rent and complex occupancy rate are the dependent variables. Each property unit type is modeled separately. The temporal quarterly dummy control variables which show an upward trend for the period are not reported. They show a statistically significant upward trend in rents for the period studied. Model 2 controls for location effects using indicator variables for county, although they are unreported. Data from six counties are used. For the 1 Bedroom, $N = 5{,}338$; for the 2 Bedroom, $N = 5{,}764$; and for the 3 Bedroom, $N = 3{,}736$.

* Significant at the 1% level.

** Significant at the 5% level.

*** Significant at the 10% level.

Exhibit 6 | Location Model 3: SUR Results

	1 Bedroom		2 Bedroom		3 Bedroom	
	Occupancy	*Ln_Rent*	Occupancy	*Ln_Rent*	Occupancy	*Ln_Rent*
Intercept	0.990***	6.169***	0.999***	6.244***	1.024***	6.492***
REIT	0.006***	0.039***	0.008***	0.044***	0.007**	0.065***
Branded	0.002	0.062***	0.005*	0.046***	−0.001	0.095***
Age (years)	0.000*	−0.010***	0.000	−0.013***	−0.000	−0.014***
# of Units (100's)	−0.003***	−0.004***	−0.003***	0.003**	−0.005***	0.007***
Unit Size (1,000s sf)	−0.040***	0.377***	−0.033***	0.353***	−0.040***	0.155***
Local Control	−0.001	−0.048***	−0.001	−0.065***	−0.006	−0.077***
# Controlled	−0.000	0.002***	−0.000	0.005***	0.000	0.005***
Pool	−0.006	0.030***	−0.005	0.021**	−0.002	0.006
Covered Parking	0.000	0.013***	0.001	0.019***	0.002	0.041***
Laundry	0.004	−0.035***	0.004*	−0.019***	−0.001	0.057***
Fitness Center	0.007***	0.006*	0.004***	0.005	0.003	0.015**
Social Facility	−0.002	0.003	0.001	0.001	0.001	−0.002
Business Center	0.002	0.015***	0.002	0.007**	0.001	0.019***
Playground	0.005***	−0.026***	0.005***	−0.036***	0.004	−0.068***

Exhibit 6 | (continued)

Location Model 3: SUR Results

	1 Bedroom		2 Bedroom		3 Bedroom	
	Occupancy	*Ln_Rent*	Occupancy	*Ln_Rent*	Occupancy	*Ln_Rent*
Gated/Cont. Access	0.002	−0.010**	0.003	−0.011**	0.003	0.011*
In-Unit Alarms	0.003	−0.034***	0.003	−0.039***	−0.006*	−0.047***
Both Sec. Measures	−0.000	−0.007*	0.000	−0.004	0.006**	0.010
Inverse Mill's Ratio	−0.002	0.017***	−0.001	0.038***	0.003	0.047***
Adj. R^2	0.075	0.715	0.071	0.757	0.080	0.731

Notes: The log of rent and complex occupancy rate are the dependent variables. Each property unit type is modeled separately. The temporal quarterly dummy control variables which show an upward trend for the period are not reported. They show a statistically significant upward trend in rents for the period studied. Model 3 controls for location using data from twenty-one submarkets, although they are unreported. Data from six counties are used. For the 1 Bedroom, $N = 5{,}338$; for the 2 Bedroom, $N = 5{,}764$; and for the 3 Bedroom, $N = 3{,}736$.

* Significant at the 1% level.

** Significant at the 5% level.

*** Significant at the 10% level.

models and ranges from 0.034 to 0.041 for the occupancy rate models, which indicates that the occupancy models are not as well specified as the log of rent models.

The primary variable of interest is the REIT variable, which is statistically significant at the 1% level and positive in the per unit log of rent models across all three unit types. The REIT variable is also positive and generally statistically significant in the occupancy models. For the Model 1 results using latitude and longitude coordinates as controls for location or geographical effects, the coefficient on the REIT variable ranges from 0.052 for the one-bedroom equation to 0.098 for the three-bedroom equation. As was shown in Benjamin, Chinloy, and Hardin (2006), the branding variable is positive and statistically significant, indicating that strategic management can impact operating performance by increasing effective gross income. The local control and number controlled variable results are intuitive. The benefit to local control goes to larger operators. Small local operators do not benefit just for being local. This property unit type has greater variability in amenities and age than the other property unit types and is less typical in the market. The Inverse Mills Ratio is positive and statistically significant at the 1% level in all the log of rent models.

The hedonic determinants of occupancy and rent are as generally expected. Per unit log of rent is positively correlated at the 1% level of significance with unit size in all rent models. In the occupancy models, there is a negative relationship with size. Age, which is a proxy for depreciation and obsolescence, is negative and significant at the 1% level across the three rent models. The playground variable is negative and significant across the rent models at the 1% level. In two of the three occupancy models, the variable is positive and significant at the 1% level. Apartment complexes that provide playground facilities may signal the need to extend the market for their properties to non-traditional users. Both of these are negative signals to the market. The other hedonic variables are in line with expectations.

The results from the additional location models shown in Exhibits 5 and 6 are similar to those found in Exhibit 4. These additional models provide a robustness check of the initial model. The REIT variable coefficients are as expected as are the ownership and hedonic variables. The location models based on the 21 sub-market model (Exhibit 6) have the highest adjusted R^2 measures of any of the location models. The adjusted R^2 measure for the occupancy models improves to between 0.071 and 0.080 and the adjusted R^2 measure for the log of rent models improves to between 0.715 and 0.757. The REIT variable remains statistically significant (at the 1% and 5% levels) across the occupancy and rent models, but the REIT variable coefficients are smaller than in the prior models. The estimated REIT coefficients are 0.039, 0.044, and 0.065 for the one-, two-, and three-bedroom models, respectively.

The empirical results support the postulate that REIT-owned apartments will generate higher effective gross income. While the results differ from Brady and

Conlin's (2004) study of REIT-owned lodging properties, the results from both studies are not mutually exclusive. The management structure for lodging properties, which emphasizes national third party property management firms, likely minimizes the organizational structure benefits that are attributable to REIT-owned properties. By developing operating scale in local markets and developing property level specialization and knowledge, operating results can be improved. The REIT ownership structure provides an environment for this type of improvement. Organizational structure characteristics and hedonic characteristics impact operating performance.

Conclusion

The ownership and management structures associated with real estate are shown to impact property performance. For the multifamily rental property type, REIT-owned properties exhibit slightly better operating performance when compared to non-REIT-owned properties. This improved performance remains after controlling for operating scale and branding effects. This increased operating performance provides another reason that REITs are willing to acquire properties at slight premiums to the prices paid by other investor groups. As an investment vehicle, REITs can benefit from increases in effective rent at the property level, as well as previously documented cost or scale efficiencies. In a general sense, the REIT ownership structure represents diversified scale operators with property management skills. The benefits are not only cost-related scale economies, but also include revenue enhancements due to the ability to better assess market and sub-market supply and demand and make adjustments in rent. The results imply that the structure of property ownership impacts property performance.

Additional support is provided for the hypothesis that both organizational structure and property-specific hedonic characteristics affect property performance. When this research is assessed relative to other existing studies on investor clienteles, there is an important implied additional component to the real estate investment decision. The market players involved in a transaction may be just as important as the location and hedonic characteristics in the determination of property rents and cash flow. Implications are related to the scale of real estate ownership, real estate portfolio construction, property valuation, and the structure of real estate investments.

Finally, one must be cognizant that the results from this study, similar to the results of Brady and Conlin (2004), are from a single market. It is imperative that more studies from additional geographic markets and property types and over different time periods are conducted. While the existing studies provide initial support for the effect of ownership and management structure on property performance and returns, more research in this area is needed to confirm the general application of these constructs.

Endnotes

[1] Other examples of participant price impacts include corporate-owned residential properties and the disposition of foreclosed properties. The focus in this case is with owners who purchase properties for similar investment-oriented reasons.

[2] The variables *Local Management* and *Number Managed* are used as exclusion restrictions when adding the Inverse Mill's Ratio to the SUR models. That is, *Local Management* and *Number Managed* are used to estimate the likelihood of obtaining REIT status but are dropped when estimating *Occupancy Rate* and *LnRent*.

[3] The data are segmented by unit type as Wolverton, Hardin, and Cheng (1999) show that the market for these unit types is a disaggregated market.

[4] The sub-market indicator variables reflect local broker and investor definitions of the cities various sub-markets.

[5] Breusch-Pagan (1980) LM test statistics for the other models produce similar results. That is, the SUR framework is appropriate for this dataset.

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