Insider Ownership and Firm Value: Evidence from Real Estate Investment Trusts

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Abstract Real estate investment trust (REIT) provides a unique laboratory to study the relation between insider ownership and firm value. One, a REIT has to satisfy special regulations which weaken alternative mechanisms to control agency problems. Empirically, I find a significant and robust nonlinear relation between Tobin's Q and REIT insider ownership that is consistent with the trade-off between the incentive alignment and the entrenchment effect of insider ownership. Two, many REITs are Umbrella Partnership REITs (UPREITs) which have dual ownership structure. They have both common shares and Operating Partnership Units (OP units). Property owners can contribute their properties to the UPREIT in exchange for OP units. Their capital gains taxes remain deferred as long as they hold onto their OP units and the UPREIT does not sell the properties they contributed. OP units owners are locked in with the firm and have incentive to monitor firm management, but their interests diverge from the common shareholders because their tax bases are much lower. Consistent with the trade-off between positive monitoring effect of OP units and tax-induced agency costs, I find that UPREIT's firm value increases with the fraction of OP units, but the effect is significantly weaker for the UPREITs where insiders hold OP units.

Keywords REITs · UPREITs · Ownership structure · Firm value · Tax · Conflict of interests

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Introduction

The separation of ownership and control, as illustrated by the dispersed ownership structure in most modern American corporations, gives managers opportunities to pursue their own interests at shareholders expense. Agency problems arise within a

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firm whenever managers have incentives to engage in non-value-maximizing activities such as "perquisite-taking" and "empire building." One way to reduce this agency cost is through managerial equity ownership. Berle and Means (1932) first proposed that firm's performance may depend on the distribution of shareholders among managers and outside shareholder.

More equity ownership by the manager means better alignment of the monetary incentives between manager and other equity owners (see, e.g., Jensen and Meckling, 1976). This implies a positive relation between firm value and managerial ownership. However, there might be unintended side effects of high insider ownership. For example, increased insider ownership permits managerial consumption of perquisites, which reduces firm value (e.g., Fama and Jensen, 1983; Barclay and Holderness, 1989). Morck et al. (1988) argue that managers respond to these two opposing forces, which leads to a hump-shaped relation between managerial ownership and firm performance. On the other hand, Demsetz (1983) argues that there should be no relationship between ownership structure and profitability, since the ownership structure of the firm is an endogenous outcome of competitive selection in which various cost advantages and disadvantages are balanced to arrive at an equilibrium organization of the firm.

Empirically, Demsetz and Lehn (1985) do not find any significant correlation between performance and ownership by large shareholders by running *linear* regressions. In contrast, Morck et al. (1988), Wruck (1989), McConnell and Servaes (1990), and Hermalin and Weisbach (1991) all find a significant *nonlinear* relationship between firm performance and insider or managerial ownership. Recent studies also reach mixed results. The relation between firm value and insider ownership is still being debated.[1]

This paper examines the relation between insider ownership and firm value using panel data on real estate investment trusts (REITs). The REITs data provide a unique laboratory to study this issue. One reason is that REITs have to satisfy several special regulations which weaken or render ineffective alternative mechanisms to control agency problems (see Section 2.1 for details). Thus, the incentive effects of managerial ownership is likely to have a more important effect on the value of REITs. Another interesting aspect of the REIT data is the existence of a special form of REIT, the Umbrella Partnership REIT (UPREIT). The UPREITs have two forms of ownership: common shares and Operating Partnership Units (OP units). This dual ownership structure enables me to conduct additional tests on the relation between firm value and ownership.

The UPREIT corporate structure enables property owners to contribute properties, on a tax-free basis, in exchange for OP units. The capital gains taxes of the unit holders remain deferred as long as they hold onto their OP units and the UPREIT does not sell the properties they contributed. This implies two opposing effects of OP units on UPREIT's firm value. On the one hand, in order to defer recognizing capital gains taxes, unit holders would hold onto their OP units for as long as possible. The OP unit owners are thus locked-in with the firm. They have both the incentive and the expertise to monitor the firm management. In addition, OP units in the hands of managers can better align their interests with shareholders

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[1] See, e.g., Loderer and Martin, 1997; Cho, 1998; Himmelberg et al., 1999; Demsetz and Villalonga, 2001.

than common shares, since shares can be sold quickly if firm performance turns bad. On the other hand, potential conflicts of interests exist between common share-holders and unit holders. The unit holders have much lower tax bases than the common shareholders. They may oppose a taxable sale of properties even if the sale would enhance shareholder wealth since the sale would trigger a large capital gains tax for them. Therefore, OP units also have a negative effect on firm value due to this tax-induced conflicts of interests, especially when the unit holders serve as top managers or board directors.

Empirically, for both regular REITs and UPREITs, I find a significant and robust nonlinear relation between insider ownership and Tobin's Q. This is consistent with the trade-off between the incentive alignment and the entrenchment effect of insider ownership. In addition, I find that UPREIT's firm value generally increases with the fraction of OP units, but the effect is substantially weaker for the UPREITs where insiders hold OP units. For these firms, the relation between firm value and insider ownership is more positive at low levels but weaker at high levels of insider ownership compared to the same relation for the UPREITs where insiders do not hold any OP units. These results are consistent with the additional trade-off between the positive monitoring effect of OP units and the tax-induced agency costs in UPREITs.

The rest of the paper is organized as follows. Section 2 describes institutional details of REITs and Umbrella Partnership REITs that are relevant to my study. Section 3 describes the data and conducts preliminary analysis. Section 4 presents the main empirical results. Section 5 concludes the paper.

Institutional Characteristics

REITs

A REIT is a corporation or business trust that invests in large-scale, income-producing commercial real estate, mortgages or real estate-related securities. The main benefit of being a REIT is one level of taxation. REITs are pass-through entities that distribute income and capital gains from investments to their shareholders untaxed. To maintain their tax-exempt status, a REIT must invest at least 75% of its total assets in real estate assets and derive at least 75% of its gross income from real estate rents or interest on mortgages on real property. It must have a minimum of 100 shareholders and no more than 50% of the shares can be held by five or fewer individuals during the last half of each taxable year, directly or indirectly (the "five or fewer" rule). In addition, REITs must pay out at least 95% (reduced to 90% as of January 2001) of their taxable income, excluding net capital gain, as dividends to their shareholders annually.

These regulations that REITs have to satisfy have important implications for corporate governance in REITs. Below, I argue that these regulations may weaken or even render ineffective typical mechanisms (except insider ownership) to control agency problems. Thus, I expect that there is a stronger relation between firm value and insider ownership for REITs than for non-REIT stocks.

The restrictions on sources of income and asset structure limit takeovers to be intra-industry, primarily among similar firms, and discourages hostile takeovers. It

also limits REIT managers' experience to be primarily real estate related. The restricted labor market might induce REIT managers to insulate themselves from hostile takeover threats, and reduce their incentives to exert themselves to greater performance. Campbell et al. (2001) provide supporting evidence for this view. They find no hostile takeovers in a sample of 85 REIT mergers and combinations. Chan et al. (2003) suggest that the lack of hostile takeover activity in the REIT sector is because many REITs use the so-called excess shareholder provision, making it difficult to acquire a large equity position in REITs.

In the absence of disciplinary takeovers, monitoring mechanisms become critical to REIT performance. However, monitoring real estate transactions of REITs are inherently difficult, since commercial real properties are illiquid and heterogeneous in many dimensions, such as geography and property type. Effective monitoring requires a keen understanding of general and local economic trends, conditions of competing properties, financing arrangements and other specialized knowledge or even inside information. Theoretically, internal monitoring by independent directors can help reduce agency problem. However, Ghosh and Sirmans (2003) find that compared to outside directors, REIT CEO exerts a greater influence both on board composition and REIT performance. The effect of monitoring by outside board members is weak at best and inadequate.

The five or fewer rule makes it difficult for large blockholders to exist in REITs. Friday et al. (1999) find no support for monitoring benefits by outside blockholders for REITs. Ghosh and Sirmans (2003) find that institutional ownership fails to serve as an alternate disciplining mechanism, although their presence seems to enhance performance. Institutions tend to vote with their feet: sell the stock if they are unhappy with management (e.g., Brickley et al., 1988). If they are not active investors in REITs, their role in firm governance is minor.

Finally, while the distribution requirement may limit the availability of free cash to managers, REIT managers still retain much discretion over the use of funds. The 90% pay out rule is not as stringent as it first appears. By a special tax exception, REITs are allowed to write off a percentage of the value of the real estate as depreciation. Depreciation decreases the amount of taxable earnings, but it does not reduce cash flow. REIT managers can pay out dividends from depreciation as well as from earnings. The depreciation expense turns out to be quite big for REITs.[2]

UPREITs

The real-estate debacle of the late 1980s and early 1990s left many debt-ridden developers dependent on the public equity markets for cash. Since they already had taken huge depreciation expenses on their property, selling a stake to a REIT, which is an "investment company" for tax purposes, would trigger big capital-gains tax. The UPREIT structure was first developed in 1992 as a mechanism to enable property owners to defer recognition of capital gains on properties while divesting themselves of the ownership of the properties.

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[2] Bradley et al. (1998) find that depreciation expense is about as big as reported net income for a sample of 75 REITs during the 1980s. For my sample of REITs between 1994 to 2000, the median ratio of depreciation expense to net income is 0.5269 for REITs and 0.8695 for the UPREITs.

An UPREIT is a real estate investment trust, whose assets are interests in a partnership that holds title, directly or indirectly, to the real estate. A typical UPREIT begins with the formation of a limited partnership by "sponsors" who transfer properties to the limited partnership in exchange for limited partnership interests characterized as Operating Partnership Units (OP units). Simultaneously, a REIT issues shares and contributes capital to the limited partnership in return for a general partnership interest. After the REIT acquires the interest in the limited partnership, it is referred to as an UPREIT. After formation, UPREITs can acquire properties by issuing additional OP units.

The unit holders may convert their OP units either into cash or UPREIT shares after a designated lock-up period (usually one or two years). Their capital gains taxes remain deferred as long as they hold onto their OP units and the UPREIT does not sell the properties they originally contributed. In fact, if the OP units end up in the owner's estate, the ultimate recipients of the units will receive a stepped-up basis. In this case, the inherent gain resulting from the UPREIT transaction will not be subject to capital gains or income tax.

OP units have two opposing effects on UPREIT's corporate value. Since disposal of OP units triggers capital gains tax for the unit holders, they are likely to hold onto their units for a long horizon.[3] OP units are typically a substantial portion of the UPREITs. With large economic interests at stake, the unit holders have incentive to actively monitor firm management. Being property developers and owners themselves, they also have the expertise to do so.[4] The positive monitoring effect of OP units increases firm value.

On the other hand, there are potential conflicts of interests between OP unit holders and common shareholders concerning governance of the UPREIT and over taxable sales of properties due to their differing tax positions. Because of long holding periods and substantial appreciation in property values, unit holders typically have very low tax bases in the properties they contributed to the UPREIT relative to the market values of these properties, which serve as the tax bases for the common shares. Unit holders' desire to maximize the tax deferral benefits and to maintain the ability to time the recognition of their capital gains tax drives a wedge between their objectives and those of the common shareholders. If the UPREIT is offered an attractive price for some properties, the common shareholders might desire to sell the properties. However, the unit holders would oppose the sale if it triggers a large tax bill for them. As a consequence, UPREITs have less flexibility in the disposition of properties. This tax-induced conflict of interests reduces firm value.

The net effect of OP units on UPREIT's firm value depends on the balance of power between common shareholders and unit holders. Although cash distributions made on each OP unit mirror the cash distributions made on each common share, they usually do not have the same control rights. For most UPREITs, the OP units have less voting rights than common stocks or do not have any voting power unless

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[3] There is also little need for the unit holders to dispose of their units. By exchanging properties for OP units of an UPREIT, property owners already achieve diversification of their holdings. Moreover, OP Units can be pledged as collateral to borrow funds.

[4] Bhide (1993) also emphasizes that active long-term stockholders can better monitor and evaluate a firm's management than outside shareholders, analysts, and takeover specialists.

converted to common stocks.[5] This implies that in general, OP units may not be able to influence firm management. Thus, I expect that overall, the positive monitoring effect of OP units dominates, so that firm value increases with the fraction of OP units in UPREITs. However, when the OP units have managerial or board representations, the tax-induced conflicts of interests can be expected to be much more severe and costly. For UPREITs where top managers and/or board directors hold OP units, the tax-induced agency costs may be big enough to overwhelm the positive monitoring effect when the fraction of OP units is high. If that is the case, then there would be a hump-shaped relation between firm value and the fraction of OP units. Even if the relation remains monotonically increasing, it should be weaker than the same relation for the UPREITs where insiders do not hold OP units.

Data and Preliminary Analysis

My empirical study uses panel data of publicly traded equity real estate investment trusts between 1994 and 2000. The primary source of data is the SNL REIT DataSource (2001 version CD ROM) produced by the SNL Financial, the leading information and research provider on the real estate industries. This database has been used in several recent papers, such as Ambrose and Linneman (2001), Ghosh and Sirmans (2003) and Sinai and Gyourko (2000). Most financial and accounting information about REITs are obtained from the SNL REIT DataSource. I also use CRSP, COMPUSTAT as well as firms' proxy statements (DEF 14A) to compute some variables used in my analysis (Table 1).

To use panel regression technique, I follow Himmelberg et al.(1999) and include only firms with three-years or more data. This gives me a total of 156 firms, mostly listed on the NYSE. Among them, there are 100 UPREITs. By the end of 2000, they have a combined equity market capitalization exceeding $155 billion and average daily dollar volume reaching over $260 million. Including the partnership units, the total market capitalization is about $285 billion. Within the whole universe of common stocks, my firms are mostly small to medium in size. For example, at the end of 2000, the mean market capitalization for REITs is 0.55 billion dollars. As the UPREIT corporate structure facilitates its acquisition of properties, UPREITs are generally larger, with an average market capitalization (including the OP units) of 1.22 million dollars. They are also relatively young firms, especially the UPREITs. By 2000, the median years in business is 12 years for REITs and 6 years for UPREITs. At the end of 2000, the average share ownership by institutional investors is 22.8% for REITs, and 43.9% of the UPREITs. The average ownership by the largest institutional investor is 6.23%, and the average ownership by the 5th largest institutional investor is 1.85%.

Following many previous studies,[6] I measure insider ownership for regular REITs as the ratio of the number of common shares owned by all directors and executive

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Table 1 Variable description

INOWN: Insider ownership. For a REIT, the insider ownership variable is measured as common shares owned by all directors and executive officers as a group (both directly and beneficially owned, also includes ownership by family members) divided by the total common shares outstanding. For an UPREIT, the insider ownership variable is the sum of common shares and OP units owned by all directors and executive officers as a group divided by the sum of total common shares outstanding and total OP units. Common shares outstanding is the number of shares issued less treasury stock, adjusted for stock dividends and stock splits.

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\begin{aligned}
INOWN1 \ &= INOWN, \text{ if } INOWN < 5\% \\
&= 5\%, \text{ if } INOWN \geq 5\%; \\
INOWN2 \ &= 0, \text{ if } INOWN < 5\%, \\
&= INOWN - 5\%, \text{ if } 5\% < INOWN < 25\%, \\
&= 20\%, \text{ if } INOWN \geq 25\%; \\
INOWN3 \ &= 0, \text{ if } INOWN < 25\%, \\
&= INOWN - 25\%, \text{ if } INOWN \geq 25\%
\end{aligned}
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Tobin's Q: the sum of REIT market capitalization, book value of long-term debt, book value of short-term debt and book value of prefered securities divided by the book value of total assets.

OPRATIO: total number of OP units divided by the sum of total number of OP units and total number of common shares outstanding. It is defined for UPREITs only.

Size: natural logarithm of book value of total asset (measured in thousands of dollars).

Leverage: book value of total debt divided by book value of total asset.

Asset Growth: annual growth rate in total asset.

NOI/Rev: the ratio of net operating income (earned from both real estate rental and operating activities) to total revenue. The net operating income excludes depreciation and amortization and the total revenue is gross of interest expense.

K/Rev: the ratio of total tangible asset to total revenue.

Sigma: annualized standard deviation of the stock return calculated using past one year's trading data.

officers (both directly and beneficially owned, including ownership by family members) to the number of total shares outstanding. For UPREITs, insider ownership is calculated as the ratio of all common shares and OP units held by the insiders to the sum of total shares outstanding and total OP units. I verify that my results are largely unchanged when I use only the CEO ownership in computing the insider ownership (see Section 4.2 and Table 7). Panel C of Table 2 shows that the mean insider ownership in 1994 is 13.1% for REITs and 17.5% for UPREITs. By comparison, the mean insider ownership is 10.6% for a sample of Fortune 500 firms used by Morck et al. (1988), and about 13.9% for the sample of McConnell and Servaes (1990).

For the UPREITs, I define a new variable "OP-ratio" which is computed as the ratio of the number of OP units to the sum of OP units and total common shares outstanding. Panel E of Table 2 shows that on average, the unit holders own a significant portion of the UPREITs, although there is a wide cross-sectional variation. At first sight, there also appears to be a trend in the OP-ratio variable. For example, the mean (median) OP-ratio in 1994 is 27% (22%). By year 2000, the mean (median) OP-ratio declines to 14% (10.2%). However, I verify that this is mostly driven by an increase in the number of common shares rather than the conversion of OP units.

Next I turn to firm value. Lang and Stulz (1994) advocate Tobin's Q as the metric to compare firm valuation. Tobin's Q is high when the firm has valuable intangible

Table 2 Summary statistics

Panel A: Tobin's Q by year

Year	REITs					UPREITs				
	Mean	Std. Dev	Percentile			Mean	Std. Dev	Percentile		
			25%	50%	75%			25%	50%	75%
1994	1.201	0.446	0.925	1.111	1.341	1.368	0.330	1.150	1.281	1.564
1995	1.195	0.431	0.914	1.111	1.395	1.289	0.216	1.128	1.263	1.449
1996	1.359	0.472	1.055	1.261	1.548	1.391	0.247	1.242	1.361	1.473
1997	1.367	0.386	1.192	1.295	1.506	1.360	0.205	1.239	1.316	1.468
1998	1.174	0.431	0.921	1.074	1.321	1.115	0.197	0.984	1.070	1.213
1999	1.045	0.373	0.844	0.994	1.148	1.027	0.171	0.918	1.011	1.094
2000	1.033	0.323	0.796	0.994	1.176	1.077	0.196	0.957	1.059	1.180

Panel B: Tobin's Q by insider ownership

Insider ownership	REITs			UPREITs		
	No. of Obs	Mean	Std. Dev	No. of Obs	Mean	Std.
0–1%	9	1.366	0.350	7	1.138	0.176
1–5%	90	1.206	0.290	72	1.142	0.216
5–10%	69	1.175	0.256	124	1.137	0.203
10–15%	40	1.177	0.325	83	1.194	0.209
15–20%	19	1.367	0.446	65	1.204	0.267
20–25%	8	1.121	0.502	31	1.291	0.344
25–30%	25	1.614	0.755	30	1.268	0.396
30–35%	4	1.157	0.559	15	1.218	0.173
35–40%	8	1.528	0.904	9	1.225	0.195
40–50%	9	0.888	0.086	12	0.992	0.207
50–60%	19	0.758	0.204	4	1.132	0.140
60–75%	11	0.783	0.180	7	0.931	0.161

Panel C: Insider ownership

Year	REITs					UPREITs				
	Mean	Std. Dev	Percentile			Mean	Std. Dev	Percentile		
			25%	50%	75%			25%	50%	75%
1994	0.131	0.127	0.026	0.089	0.208	0.175	0.105	0.084	0.175	0.226
1995	0.145	0.154	0.034	0.069	0.210	0.167	0.101	0.089	0.161	0.220
1996	0.142	0.162	0.031	0.078	0.185	0.135	0.086	0.066	0.119	0.187
1997	0.129	0.161	0.030	0.059	0.140	0.119	0.091	0.052	0.098	0.158
1998	0.191	0.214	0.043	0.096	0.275	0.146	0.137	0.059	0.099	0.182
1999	0.197	0.212	0.056	0.107	0.269	0.160	0.145	0.066	0.120	0.201
2000	0.209	0.212	0.065	0.112	0.284	0.158	0.131	0.074	0.120	0.200

Table 2 (continued)

Panel D: Relative proportion of OP units for UPREITs

Year	Mean	Std. Dev	Percentile		
			25%	50%	75%
1994	0.270	0.165	0.143	0.220	0.401
1995	0.204	0.131	0.104	0.189	0.318
1996	0.180	0.134	0.087	0.154	0.264
1997	0.149	0.111	0.081	0.123	0.182
1998	0.152	0.146	0.046	0.111	0.188
1999	0.153	0.142	0.050	0.105	0.233
2000	0.140	0.131	0.046	0.102	0.205

Panel E: Control variables

Year	REITs					UPREITs				
	Mean	Std. Dev	Percentile			Mean	Std. Dev	Percentile		
			25%	50%	75%			25%	50%	75%
Size	12.689	1.447	11.867	12.966	13.626	13.732	1.091	13.178	13.655	14.442
Leverage	0.438	0.193	0.279	0.401	0.596	0.440	0.127	0.353	0.431	0.530
Asset Growth	0.298	0.795	0.012	0.155	0.321	0.445	0.902	0.036	0.163	0.515
NOI/Rev	0.685	0.230	0.557	0.659	0.881	0.711	0.124	0.638	0.689	0.763
K/Rev	6.704	2.240	5.356	6.588	8.123	7.427	2.646	6.077	7.013	8.192
Sigma	0.232	0.143	0.145	0.200	0.272	0.211	0.112	0.153	0.193	0.237

This table reports some summary statistics for various variables used in the empirical study, including Tobin's Q, insider ownership, opratio and several control variables. See Table 1 for their definitions. Our sample consists of 156 publicly traded equity real estate investment trusts from 1994–2000. Insider ownership data are obtained from firm's proxy statement (Def 14A). Stock return data from CRSP are used to compute stock volatility. All other data are obtained from SNL DataSource.

assets in addition to physical capital, such as good management team and governance structure.[7] I adopt the Perfect and Wiles (1994) measure of Tobin's Q, computed as the sum of market value of common stocks (including OP units in the case of UPREITs), book value of long-term debt, book value of short-term debt and book value of preferred securities, divided by the book value of total assets. This measure is easier to compute and it maximizes usable data within my panel data. Further, Perfect and Wiles report that this measure of Q has a correlation of 0.93 with that estimated using the Lindenberg and Ross (1981) approach which requires many years of data in order to estimate replacement costs of assets.

Panel A of Table 2 presents some summary statistics for Tobin's Q by year. The average Tobin's Q for REITs is significantly higher than 1 during 1994–1997, but it

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[7] Alternatively, Tobin's Q may also proxy for growth opportunities. However, since all firms in my sample operate in a single industry, they face similar growth opportunities. Moreover, I control for asset growth and include property type dummies in pooled OLS regressions. I also use firm fixed-effects estimator. These techniques control for potential cross-sectional heterogeneity in the growth opportunities of REITs.

drops to barely above 1 by year 2000. On average, the UPREITs have higher Tobin's Q than the regular REITs before 1997. This difference is statistically significant. However, there is little difference between the Tobin's Q for the two groups after 1997. This is consistent with the finding of Sinai and Gyourko (2000) that the capital gains tax cut under the Taxpayer Relief Act of 1997 reduces the benefit of being an UPREIT. Panel B of Table 2 presents some summary statistics for Tobin's Q by insider ownership. It clearly reveals a nonlinear relation between Tobin's Q and insider ownership, which is generally positive at low levels of insider ownership but turns negative beyond about 25%.

Empirical Results

Below, I use multivariate regressions to examine the relation between Tobin's Q and insider ownership, separately for the regular REITs and for the UPREITs. Year dummies are included in all regressions to control for the time effect (such as differences in Tobin's Q across years). In Section 4.3, I focus on the UPREITs and include OP-ratio as an additional regressor to examine the relation between Tobin's Q and OP units. I also study how the relations between firm value and ownership structure depend on whether the UPREIT insiders hold OP units.

Methodology

To capture the nonlinear relation between Tobin's Q and insider ownership that the preliminary analysis suggests, I regress Tobin's Q on a piecewise linear function of insider ownership. Following Morck et al. (1988), two changes in the slope coefficient on insider ownership are allowed in the piecewise-linear regression. For a given pair of breakpoints, $0 < a_1 < a_2 < 1$, I define three regressors that differentiate the influence of insider ownership on Tobin's Q at three regions:

INOWN1	$= m$, if $m < a_1$
	$= a_1$, if $m \geq a_1$;
INOWN2	$= 0$, if $m < a_1$,
	$= m - a_1$, if $a_1 < m < a_2$,
	$= a_2 - a_1$, if $m \geq a_2$;
INOWN3	$= 0$, if $m < a_2$,
	$= m - a_2$, if $m \geq a_2$

I use the standard choice of breakpoints in the literature: $a_1 = 5\%$, and $a_2 = 25\%$ [see, e.g., Morck et al. (1988)]. The 5% level is a focal stake by the SEC as a point of mandatory public disclosure of ownership. The breakpoint at 25% can be motivated by Weston (1979) who suggests 20–30% as the ownership range beyond which a hostile bid for the firm cannot succeed. I verify that the piecewise linear regression results are robust to the choice of alternative breakpoints within reasonable ranges.

An alternative way to capture the curvilinear relation between Tobin's Q and insider ownership is to run a quadratic regression which includes the square of insider

ownership as an additional regressor [see, e.g., McConnell and Servaes (1990)]. One advantage of this quadratic specification is that by looking at the regression co-efficients, the data will tell us not only whether there is a humped relation but also the locus of the optimal inflection point.

To deal with the possibility that a variety of factors can jointly affect insider ownership and Q and thus induce a spurious correlation between them, I control for several observable firm characteristics in the regressions. It is possible that Q and insider ownership are related through the size of the firm. It may be easier for insiders to own a larger piece of a smaller firm, and size and Q may be negatively correlated. To capture potential nonlinear effect of size on firm value, I include both size and square of size as regressors in the Tobin's Q regressions. I measure size as the logarithm of REIT's total asset value. Alternative measure for size such as loga-rithm of total market cap or total real estate revenues does not alter my results much.

I include asset growth rate as a regressor to control for growth opportunities. There is a fair amount of time-series and cross-sectional variations in REIT asset growth rate, as can be seen from the standard deviation and different percentiles reported in Panel E of Table 2. I also control for REIT's leverage ratio in the Tobin's Q regression. The use of debt can reduce free cash flow by making interest payment mandatory and mitigate agency problems (e.g., Jensen 1986). In addition, following previous studies such as Himmelberg et al. (1999), I control for ratio of net operating income to total revenues (NOI/Rev) and the ratio of book value of tangible assets to total revenues (K/Rev). Finally, I control for firm volatility, computed using the daily return over the past one year. Demsetz and Lehn (1985) use stock price volatility as a proxy for "control potential." Higher volatility makes it more difficult to monitor managers' decisions, leaving more room for managerial discretion, and thus increases equilibrium managerial ownership level. Panel E of Table 2 reports descriptive statistics for the above control variables.

A well-known problem in the study of firm value and insider ownership is that insider ownership may be endogenous.[8] I address the endogeneity problem in two ways. One is the simultaneous equation approach. I estimate the regression models using two-stage-least-squares. Himmelberg et al. (1999) provide arguments for omitting firm size and stock price volatility from the Q regression. Following their work, I use stock price volatility, firm size and its square as the instruments for insider ownership variables in the Tobin's Q regressions.

The second approach I use to address the endogeneity problem is the firm fixed-effects estimator which takes advantage of the panel data. In a prior version of this paper, I find that unobserved firm heterogeneity are important determi-nants for optimal managerial ownership and the unobservable sources of firm heterogeneity appear to be constant through time.[9] Similar results are obtained by

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[8] For example, rather than share ownership motivates managers to do well, it could be that shares are awarded to the managers after good firm performance. Note that this is not an issue with OP units in the UPREITs, as OP units can not be awarded to the managers. They hold OP units only when they have contributed properties to the UPREITs. The fact that part of UPREIT insider ownership is the OP units that insiders hold also mitigates the possible endogeneity of insider ownership in UPREITs.

[9] Pooled OLS regressions with insider ownership as the dependent variable show that observable firm characteristics have only limited power explaining the cross-sectional and time-series variation of insider ownership. However, the adjusted R^2 increases dramatically once firm-level fixed effects model is used.

Palia (2001) for non-REIT stocks. He shows that the fixed-effects model is unbiased and dominates both pooled OLS regressions and the random-effects model. Both Himmelberg et al. (1999) and Palia (2001) recommend using firm fixed-effects estimator to study the relation between firm value and insider ownership. To facilitate comparison to many earlier studies, I also report the results of pooled OLS regressions.

Tobin's Q and Insider Ownership

Table 3 reports the results of Tobin's Q-insider ownership regressions for both piecewise linear and quadratic specifications, run separately for the regular REITs and the UPREITs. I estimate all models using three methods: pooled OLS, firm fixed-effects estimator and two-stage-least-squares. The t-statistics of the parameter estimates are computed using the White (1980) heteroscedasticity-consistent standard errors.

I find that for both regular REITs and UPREITs, insider ownership is a significant determinant of firm value. This holds for all three econometric methods and two specifications. In particular, although the fixed-effects estimator makes it hard to detect any relation between ownership and performance (see e.g., Zhou, 2001), I still find a significant nonlinear relation between firm value and insider ownership for the real estate investment trusts using the firm fixed-effects estimator. This relation is also stronger and more robust than that for the non-REIT stocks. For example, Himmelberg et al. (1999) find that for their sample of non-REIT stocks, the significant statistical relationship between insider ownership and Tobin's Q found using pooled OLS regression largely disappears once firm fixed-effects model is used.

In the case of regular REITs, the estimated coefficient in the fixed-effects model for INOWN1 is significantly positive. Other things equal, Tobin's Q will increase by 0.13 when insider ownership increases from 0% to 5%. The estimated coefficient for INOWN2 is also significantly positive, but it is smaller in magnitude. On the other hand, the relation between Q and insider ownership above 25% turns negative, although not significantly so. Quadratic specification also reveals a significant humped relation between Q and insider ownership that is positive at low levels and negative at high levels of insider ownership. These results are similar to previous studies.[10] They are consistent with a trade-off between the incentive alignment and entrenchment effect of insider ownership.

Using REIT data for 1980's and early 1990's, Friday et al. (1999) find that the relationship between market-to-book ratio and insider ownership is positive up to 5% and turns negative after that. In comparison, for REITs in my 1994–2000 sample, Tobin's Q is positively related to insider ownership up to 25%. The difference is consistent with reduction in agency costs in modern REITs brought by several recent important changes. A new era for modern REITs began in 1993 when REIT investment barriers to pension funds were eliminated, resulting in the large-scale

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[10] For example, McConnell and Servaes (1990) document a positive effect of insider ownership on Q up to 40% to 50% level of insider ownership, which turns mildly negative after that. Hermalin and Weisbach (1991) report that the relationship between Q and managerial stock ownership is positive between 0% and 1%, negative between 1% and 5%, positive between 5% and 20%, and negative after that.

Table 3 Tobin's Q and insider ownership

Variable	Regular REITs			UPREITs		
	Pooled	Firm effects	2SLS	Pooled	Firm effects	2SLS
Panel A: Piecewise linear specification						
INOWN1	−2.609	2.671	54.162	−1.151	0.009	14.405
	(−2.182)	(3.288)	(2.119)	(−0.911)	(0.011)	(0.442)
INOWN2	2.092	0.391	−8.570	0.811	0.352	6.174
	(4.481)	(1.830)	(−1.344)	(4.490)	(2.281)	(1.858)
INOWN3	−1.031	−0.150	4.373	−0.431	−0.141	−5.111
	(−3.593)	(−0.605)	(0.542)	(−3.168)	(−1.543)	(−1.931)
Size	0.777	0.719	–	0.022	0.316	–
	(3.498)	(2.798)	–	(0.240)	(1.749)	–
Size^2	−0.029	−0.027	–	−0.001	−0.016	–
	(−3.241)	(−2.530)	–	(−0.244)	(−2.338)	–
Leverage	0.255	−0.348	−1.503	0.393	−0.189	−1.183
	(1.798)	(−1.932)	(−2.669)	(4.363)	(−1.321)	(−4.029)
Asset Growth	0.055	−0.011	0.096	0.054	0.012	−0.058
	(1.513)	(−1.508)	(0.963)	(2.017)	(0.805)	(−0.715)
NOI/Rev	0.530	0.387	1.214	0.061	−0.049	0.098
	(2.980)	(4.003)	(1.114)	(0.452)	(−0.469)	(0.251)
K/Rev	−0.094	−0.003	−0.192	−0.030	−0.005	−0.035
	(−5.666)	(−0.359)	(−1.204)	(−2.666)	(−1.380)	(−0.987)
Sigma	−0.475	−0.035	–	−0.138	−0.145	–
	(−3.402)	(−0.679)	–	(−1.853)	(−2.376)	–
Adjusted R^2	0.523	0.944		0.444	0.887	
Panel B: Quadratic specification						
INOWN	1.894	0.819	6.092	0.894	0.396	7.937
	(4.481)	(3.382)	(0.792)	(4.410)	(2.228)	(2.257)
INOWN^2	−2.765	−1.072	−14.756	−1.254	−0.485	−12.628
	(−4.696)	(−2.336)	(−0.905)	(−4.166)	(−2.469)	(−2.287)
Size	0.705	0.665	–	−0.008	0.295	–
	(3.338)	(2.614)	–	(−0.088)	(1.641)	–
Size^2	−0.026	−0.025	–	0.000	−0.015	–
	(−3.085)	(−2.360)	–	(0.107)	(−2.252)	–
Leverage	0.206	−0.329	−0.810	0.406	−0.199	−1.171
	(1.354)	(−2.438)	(−2.508)	(4.401)	(−1.452)	(−4.380)
Asset Growth	0.053	−0.010	−0.028	0.057	0.013	−0.014
	(1.518)	(−1.521)	(−0.230)	(2.070)	(0.821)	(−0.238)
NOI/Rev	0.520	0.410	−0.993	0.088	−0.058	0.166
	(2.886)	(4.212)	(−0.691)	(0.640)	(−0.555)	(0.957)
K/Rev	−0.097	−0.003	0.063	−0.032	−0.005	0.009
	(−5.830)	(−0.399)	(0.386)	(−2.817)	(−1.462)	(0.388)
Sigma	−0.454	−0.041	–	−0.160	−0.152	–
	(−3.229)	(−0.782)	–	(−2.228)	(−2.490)	–
Adjusted R^2	0.513	0.944		0.436	0.887	

This table reports the results of regression model which specifies Tobin's Q as a piecewise linear or quadratic function of its insider ownership (INOWN) controlling for other variables. Size is the logarithm of firm's total asset value (measured in thousands of dollars). NOI/Rev is the ratio of net operating income to total revenue. K/Rev is the ratio of total tangible asset to total revenue. Sigma is annualized stock return volatility. Regressions are run separately for REITs and UPREITs. There are 311 observations for the REITs and 459 observations for the UPREITs. Intercept terms and year dummies are included for all regressions, but not reported. Firm fixed-effects are included where indicated, but not reported. Standard errors are adjusted for heteroscedasticity according to White (1980) and the t-statistics are reported in parentheses below the coefficients.

entry of Wall Street and the public sector as sources of capital for real estate.[11] For example, Chan et al. (1998) find that after 1994, REITs attract more institutional investors than comparable non-REIT stocks, but they were neglected before. Another change in the REIT industry that lowers agency costs concerns how REITs are managed. Prior to the 1986 Tax Reform Act, REITs were not allowed to manage their own properties, forcing them to contract out the operations to third parties, whose economic interests might diverge from those of the shareholders. For example, the external advisors can affect the decisions on who will be awarded REIT's contracts or business. But the advisors or an affiliated entity of the advisor can also be a participant in the deal, and might receive favorable terms. Such self-dealing hurts the shareholders of REIT.[12] In contrast, 92% of UPREITs and 71% of REITs in my sample are self-advised and self-managed. When I add a dummy for externally advised REITs in the pooled OLS regressions reported in Table 3, it is not significant.

I also find a significant nonlinear relation between insider ownership and Tobin's Q for the UPREITs. For example, in the case of quadratic specification, Panel B of Table 3 shows that the estimated coefficient is positive for insider ownership and negative for its square. Both coefficients are statistically significant using all three econometric estimation methods. The optimal insider ownership (inflection point) implied by the regression coefficients ranges from about 33% to 40% In other words, Tobin's Q increases with insider ownership, but at a decreasing rate, so that at a level higher than the inflection point, more insider ownership distracts from firm value. The only difference between the results for REITs and UPREITs is that for the UPREITs, there is no significant relation between Q and insider ownership below 5% in the piecewise linear specification, although insider ownership between 5% and 25% are significantly and positively related to UPREIT's firm value.

The relation between firm value and leverage deserves some comments. For REITs, the benefits of debt are of limited relevance: REITs do not pay corporate tax. Howe and Shilling (1988) argue that it is not good for REITs to use debt since they are at a comparative disadvantage. Tax-paying firms can afford to pay higher interest rate because they enjoy tax savings by issuing debt. Further, the potential bankruptcy costs associated with high amount of debt is particularly relevant for REITs because of cyclical nature of the real estate market and the high operating leverage of most equity REITs. Consistent with these arguments, I find that the coefficient for leverage in the Tobin's Q regression is significantly negative, for both regular REITs and UPREITs, using the firm fixed-effects as well as the two-stage-least-squares estimator. This suggests that use of debt imposes costs on REIT shareholders.

Next, I investigate whether the relationship between insider ownership and firm value documented above is affected by REIT institutional ownership. Chan et al. (1998) find that a relatively small group of institutional investors have rather high

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[11] The five or fewer rule was relaxed for financial institutions such as pension funds through the enactment of the Omnibus Budget Reconciliation Act of 1993. This modification allows each institutional beneficiary such as a pension plan beneficiary, rather than the pension fund itself, to be considered an individual REIT shareholder.

[12] Among others, Howe and Shilling (1990) and Hsieh and Sirmans (1991) document under-performance of externally managed REITs using pre-1992 data. Capozza and Seguin (2000) argue that this is largely due to excessive use of debt and abnormally high interest rate paid by externally advised REIT. Ambrose and Linneman (2001) find that after controlling for firm size and property-sector effects, any advantage enjoyed by internally advised REITs is minor.

holdings in REITs. I define a dummy variable that takes value 1 for a REIT if its largest institutional ownership is over 10%. The 10% holding limit triggers restriction on short-term trading by Section 16(b) of the Securities Exchange Act of 1934. With reduced liquidity, institution investors with more than 10% stake have more incentives to monitor and influence the firm management rather than "vote with their feet." Their presence should reduce agency cost in REITs and may dampen the humped relation between insider ownership and firm value.

I find some evidence supporting this hypothesis for the regular REITs. Table 4 shows that there is still a significant and humped relation between insider ownership and Tobin's Q for those REITs where no institutions hold more than 10% of the firm. But for those REITs whose largest institutional investors hold more than 10% of the firm, Tobin's Q is positively related to insider ownership, even at high levels of insider ownership. For these REITs, it seem that their institutional ownership are active and powerful enough to reduce the agency costs sufficiently so that the incentive alignment effect of insider ownership dominates the entrenchment effect.

Tobin's Q and OP Units for UPREITs

This section focuses on the UPREITs. I conduct further analysis on the determinant of UPREIT's firm value to answer the following questions. One, is there any

Table 4 Tobin's Q and ownership: the effect of institutional ownership

Variable	REITs			UPREITs		
	Inst. own		Difference	Inst. own		Difference
	Passive	Active		Passive	Active	
Panel A: Piecewise linear specification						
INOWN1	3.045	2.019	−1.027	−0.559	0.510	1.069
	(2.587)	(1.938)	(−0.644)	(−0.449)	(0.446)	(0.622)
INOWN2	0.576	0.184	−0.393	0.379	0.332	−0.047
	(2.277)	(0.555)	(−1.013)	(1.794)	(1.488)	(−0.154)
INOWN3	−0.385	0.485	0.870	0.447	−0.203	−0.651
	(−1.458)	(1.824)	(2.318)	(1.001)	(−2.083)	(−1.381)
Panel B: Quadratic specification						
INOWN	1.206	0.155	−1.051	0.083	0.350	0.267
	(4.022)	(0.496)	(−2.651)	(0.254)	(1.420)	(0.679)
INOWN^2	−1.805	0.457	2.262	0.774	−0.490	−1.264
	(−3.332)	(1.160)	(3.468)	(0.926)	(−1.960)	(−1.470)

This table reports the results for Q-insider ownership regressions that allow the relationship between Q and insider ownership to be different across REITs with and without large ownership by institutional investors. I define a dummy variable that takes value 1 for a REIT if the largest institutional investor holds more than 10% of the firm (I call such a REIT as having "active" institutional investors). Independent variables in the regressions are insider ownership variables, their interactions with the dummy for active institutional investors, as well as the same set of control variables as in Table 3 (not reported) and year dummies (not reported). All results here are obtained using the firm fixed-effects estimator. Regressions are run separately for regular REITs and UPREITs. There are 311 observations for the regular REITs and 459 observations for the UPREITs. Standard errors are adjusted for heteroscedasticity according to White (1980) and the t-statistics are reported in parentheses below the coefficients.

significant relation between firm value and the fraction of OP units in UPREITs? Is this relation humped or monotonic? Two, does the presence of OP units affect the relation between insider ownership and firm value for UPREITs documented in Section 4.2? Third, do the answers to the first two questions depend on whether the insiders hold OP units?

I add the "OP-ratio" variable (as well as its square in some cases) to the regressions, keeping the insider ownership variables and other control variables used before. Table 5 presents the result from firm fixed effect regressions. It shows that UPREIT's Q increases with its OP-ratio, or the amount of OP units relative to common shares. This positive relation is statistically significant and there is no evidence that it turns negative at high levels of OP-ratio. It suggests that among all UPREITs, those with higher proportion of OP units tend to have higher valuation. This result complements Hartzell et al. (2005) who find that among all real estate investment trusts, UPREITs have significantly higher market valuations at the time of IPO, as well as significantly higher operating performance during the first year after IPO.

In addition, Table 5 shows that the significant relation between UPREIT's firm value and OP-ratio affects the estimated relation between firm value and insider ownership. This happens because UPREIT's insider ownership is significantly and positively correlated with OP-ratio.[13] In the presence of OP-ratio, while there is still a significant nonlinear relation between insider ownership and firm value under the pooled OLS regression approach, the humped relation becomes insignificant under the firm fixed-effects estimator. For example, the estimated coefficient for insider ownership at the intermediate level (INOWN2) is reduced from 0.352 in Table 3 Panel A (when OP-ratio is absent) to 0.156 in Table 5 (in the presence of OP-ratio), and is no longer statistically significant. After controlling for the positive effect of the OP-ratio variable, only the negative relation between firm value and insider ownership above 25% remains significant.

These results are consistent with the idea that the unit holders are long-term investors and their monitoring increases firm value. In Section 2.2, I also argue that differences in tax bases drive a wedge between the interests of OP units owners and common shareholders. The results above suggest that overall, the cost of this conflict of interests is smaller than the monitoring benefits even at high levels of OP units. Since the tax-induced conflict of interests is property-specific when it occurs, in most cases the unit holders being affected by a taxable sale of properties may not be powerful enough to influence firm's decision, especially when OP units have less voting power than common stocks. Of course, when top managers or board directors themselves hold OP units, this conflict of interests can be expected to cause more damage to firm value.

Now I investigate how the trade-off between the positive monitoring effect of OP units and the tax-induced conflicts of interest varies across UPREITs with and without OP units ownership by the insiders. In my sample, insiders at 44 of the 100 UPREITs hold OP units. Not surprisingly, insiders at UPREITs that have higher fraction of OP units are more likely to own OP units. For example, insiders at 30 of the 50 UPREITs whose OP-ratio is higher than the cross-sectional median hold OP

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[13] I find that the cross-sectional correlation between insider ownership and OP-ratio ranges from 0.44 to 0.64 for different year sub-sample.

Table 5 Tobin's Q and OP units for UPREITs

Variable	Pooled OLS			Firm fixed effects		
	(1)	(2)	(3)	(1)	(2)	(3)
OPRATIO	0.589	0.779	0.632	0.564	−0.197	0.553
	(9.131)	(4.499)	(8.610)	(4.086)	(−0.974)	(3.803)
OPRATIO^2	–	−0.375	–	–	1.383	–
	–	(−1.182)	–	–	(3.174)	–
INOWN1	–	–	−1.082	–	–	−0.006
	–	–	(−0.809)	–	–	(−0.007)
INOWN2	–	–	0.306	–	–	0.156
	–	–	(1.985)	–	–	(0.982)
INOWN3	–	–	−0.638	–	–	−0.186
	–	–	(−4.585)	–	–	(−1.823)
Size	0.256	0.221	0.210	0.161	0.177	0.183
	(2.090)	(1.748)	(1.741)	(0.954)	(1.144)	(1.018)
Size^2	−0.009	−0.008	−0.007	−0.010	−0.011	−0.011
	(−1.976)	(−1.672)	(−1.688)	(−1.596)	(−1.871)	(−1.601)
Leverage	0.313	0.345	0.280	−0.281	−0.292	−0.258
	(3.318)	(3.531)	(2.904)	(−3.133)	(−3.302)	(−2.751)
Asset Growth	0.065	0.063	0.055	0.013	0.016	0.012
	(4.333)	(4.171)	(3.706)	(0.798)	(0.959)	(0.777)
NOI/Rev	0.130	0.123	0.073	−0.063	−0.068	−0.050
	(1.680)	(1.581)	(0.954)	(−0.603)	(−0.723)	(−0.467)
K/Rev	−0.035	−0.034	−0.031	−0.007	−0.008	−0.007
	(−6.990)	(−6.516)	(−6.049)	(−1.814)	(−2.146)	(−1.705)
Sigma	−0.145	−0.131	−0.093	−0.052	−0.035	−0.048
	(−1.718)	(−1.536)	(−1.113)	(−0.592)	(−0.376)	(−0.524)

This table reports the results for regressing Tobin's Q of UPREITs on opratio and its square, with or without insider ownership variables. Opratio is defined as total number of OP units held by the property owners divided by the sum of the number of these OP units and total number of common shares outstanding. Insider ownership is the sum of common shares and OP units owned by all directors and executive officers divided by the sum of total common shares outstanding and total OP units. There are 459 observations for all regressions, which also include intercept and year dummies (not reported). Firm fixed-effects are included where indicated, but not reported. Standard errors are adjusted for heteroscedasticity according to White (1980) and the *t*-statistics are reported in parentheses below the coefficients.

units. In contrast, among the 50 UPREITs whose OP-ratio is lower than the cross-sectional median of OP-ratio, only 14 have insiders holding OP units. I construct a dummy variable that takes value 1 if UPREIT insiders hold OP units. Then I include this dummy as well as its interactions with the insider ownership variables and OP-ratio as additional regressors in the Tobin's Q regression. The results are reported in Table 6.

Table 6 shows that whether insiders hold OP units matters for the relation between UPREIT's firm value and insider ownership or OP-ratio. For those UPREITs where the insiders do not hold any OP units, the effect of OP units on Tobin's Q is significantly positive and stronger than the same relation for the whole sample of UPREITs reported in Table 5. The estimated coefficient of OP-ratio for the UPREITs where insider hold OP units is only about half in magnitude as the

Table 6 Tobin's Q and ownership structure: does it matter whether insiders hold OP units?

Variable	Pooled OLS			Firm fixed effects		
	Insider units		Difference	Insider units		Difference
	No	Yes		No	Yes	
Intercept	0.411	0.338	−0.073			
	(0.562)	(0.462)	(−0.696)			
INOWN1	−1.699	1.238	2.937	−0.855	1.977	2.833
	(−0.906)	(0.768)	(1.238)	(−0.722)	(2.094)	(1.816)
INOWN2	0.489	0.378	−0.112	0.309	0.035	−0.274
	(1.926)	(1.738)	(−0.333)	(1.939)	(0.145)	(−0.858)
INOWN3	−0.661	−0.263	0.398	−0.239	−0.153	0.086
	(−2.912)	(−1.202)	(1.287)	(−1.688)	(−0.924)	(0.393)
OPRATIO	0.865	0.212	−0.653	0.643	0.383	−0.260
	(7.633)	(1.482)	(−3.646)	(3.193)	(3.522)	(−1.149)
Size	0.149			0.231		
	(1.390)			(1.214)		
Size^2	−0.005			−0.012		
	(−1.355)			(−1.771)		
Leverage	0.254			−0.270		
	(2.613)			(−2.060)		
Asset Growth	0.055			0.014		
	(2.199)			(0.884)		
NOI/Rev	0.000			−0.001		
	(0.325)			(−0.541)		
K/Rev	−0.027			−0.007		
	(−2.869)			(−1.806)		
Sigma	−0.128			−0.036		
	(−1.200)			(−0.371)		

This table reports the results of Tobin's Q regressions that allow the relationship between Q and insider ownership as well as opratio to depend on whether the board directors and executive officers hold OP units or not. Insiders at 44 out of the 100 UPREITs hold OP units. Both regressions have 459 observations. Intercept terms and year dummies are included for all regressions, but not reported. Firm fixed effects are included where indicated, but not reported. Standard errors are adjusted for heteroscedasticity according to White (1980) and the t-statistics are reported in parentheses below the coefficients.

coefficient of OP-ratio for the UPREITs where insiders do not hold OP units. This is consistent with higher tax-induced agency costs in the UPREITs where insiders own OP units. For these UPREITs, the relation between firm value and insider ownership is more positive at low levels but weaker at high levels of insider ownership compared to the corresponding relations for the UPREITs where insiders do not hold any OP units. These comparisons hold for both pooled OLS and firm fixed-effects estimators.

Additional Robustness Checks

Previous results on the relation between firm value and insider ownership, established using panel data on real estate investment trusts, are robust to econometric

estimation methods (pooled OLS, firm fixed-effects, simultaneous equations) and
specifications (piecewise linear or quadratic in insider ownership). Table 7 reports
some additional robustness checks for these results using the year 2000 data (the last
year in my sample). In all of the regressions reported in Table 7, I include two proxies
for the effectiveness of board monitoring as additional regressors. "CEODUAL" is a
dummy that takes value 1 for firms where the CEO also serves as the Chairman of the

Table 7 Tobin's Q and ownership structure: robustness checks

Variable	Piecewise linear		Quadratic	
	Insider	CEO	Insider	CEO
Panel A: Regular REITs				
OWN_1	−5.150	1.907	–	–
	(−1.131)	(0.578)	–	–
OWN_2	2.574	2.417	2.583	3.438
	(2.866)	(2.110)	(3.311)	(1.947)
OWN_3	−1.275	−1.905	−3.767	−6.132
	(−2.131)	(−1.843)	(−3.687)	(−1.863)
Size	0.012	0.009	0.015	0.013
	(0.333)	(0.327)	(0.447)	(0.435)
Leverage	−1.318	−1.193	−1.446	−1.188
	(−4.930)	(−3.731)	(−6.038)	(−3.940)
Asset Growth	0.062	−0.118	0.095	−0.096
	(0.223)	(−0.331)	(0.393)	(−0.275)
CEODUAL	−0.038	−0.056	−0.035	−0.089
	(−2.638)	(−2.133)	(−2.987)	(−2.135)
OUTDIR	0.030	0.039	0.031	0.070
	(1.848)	(1.579)	(2.269)	(1.876)
Adjusted R^2	0.432	0.351	0.464	0.359
Panel B: UPREITs				
	(1)	(2)	(3)	(4)
OWN_1	−1.509	−2.293	–	–
	(−0.794)	(−1.287)	–	–
OWN_2	0.813	0.622	0.841	0.683
	(2.134)	(1.745)	(2.258)	(1.781)
OWN_3	−0.668	−0.604	−1.478	−1.266
	(−2.868)	(−2.516)	(−2.956)	(−2.631)
OPRATIO	–	0.740	–	0.589
	–	(2.975)	–	(2.283)
$OPRATIO * InsiderOP$	–	−0.574	–	−0.488
	–	(−2.218)	–	(−1.814)
Size	−0.013	−0.013	−0.006	−0.003
	(−0.688)	(−0.697)	(−0.331)	(−0.161)
Leverage	−0.486	−0.623	−0.288	−0.337
	(−2.489)	(−3.432)	(−1.731)	(−1.811)
Asset Growth	0.279	0.230	0.319	0.291
	(1.850)	(1.590)	(2.029)	(1.859)

Table 7 (continued)

Variable	Piecewise linear		Quadratic	
	Insider	CEO	Insider	CEO
CEODUAL	−0.050	−0.058	−0.059	−0.040
	(−1.392)	(−1.609)	(−1.583)	(−1.476)
OUTDIR	0.029	0.037	0.160	0.096
	(1.080)	(1.042)	(0.708)	(1.035)
Adjusted R^2	0.183	0.262	0.135	0.186

This table presents several robustness checks on the the relation between firm value and ownership variables reported in the previous tables. Panel A is for the regular REITs. It includes two proxies for the effectiveness of board monitoring as regressors in addition to the insider ownership variables and other control variates. "CEODUAL" is a dummy that takes value 1 for firms where the CEO serves as the Chairman of the Board. "OUTDIR" is the ratio of the number of outside (independent) directors to the total number of directors on the Board. Two measures of insider ownership are used in the regressions. One includes the share ownership of all directors and executive officers (corresponding to the columns labelled by "Insider"). In the columns labelled "CEO," I only use CEO share ownership to compute insider ownership. For the piecewise linear specification, OWN_1, OWN_2 and OWN_3 are the three piecewise linear insider ownership variables defined in Table 1. For the quadratic specification, OWN_2 is the insider ownership, and OWN_3 is the square of insider ownership. Panel B applies to UPREITs. InsiderOP is a dummy variable that takes value 1 for the UPREITs where the insiders hold OP units. All regressions in this table use the year 2000 data. Standard errors are adjusted for heteroscedasticity according to White (1980) and the t-statistics are reported in parentheses below the coefficients.

Board.[14] "OUTDIR" is a proxy for board independence, defined as the ratio of the number of outside directors to the total number of directors on the Board. Outside directors are defined as those that are not officers of the firm or its affiliates such as investment advisor. In the regressions labelled by "CEO," I use CEO ownership rather than the total ownership of all directors and executive officers.

Table 7 shows that other things equal, REITs where the CEO controls the Board tend to have lower valuation, and REITs with more independent board tend to have higher valuation. The coefficients for "CEODUAL" and "OUTDIR" are significant for the regular REITs, but not for the UPREITs. These results are consistent with Ghosh and Sirmans (2003) who find that outside directors on REIT boards weakly enhance performance, and when CEO doubles as the Chairman of the Board, REIT performance is adversely affected. Friday and Sirmans (1998) find that increased outsider representation on the board of directors leads to higher firm value up to a point. As outside representation becomes too large, firm value is decreasing in the proportion of outside directors.

More importantly, Table 7 shows for both regular REITs and UPREITs, the significant and nonlinear relation between Tobin's Q and insider ownership documented before persists after I control for board monitoring. Using CEO ownership does not change the results either. In addition, Panel B of Table 7 shows that after controlling for board monitoring, UPREIT's firm value is still significantly positively related to the fraction of OP units. Further, this positive relation is still significantly

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[14] For some firms, the CEO and the Chairman of the Board are two different persons, but belong to the same family (e.g., Simon Property Group, Weingarten Realty Investors, Reckson Associates Realty Corp, Winston Hotels Inc). In these cases, I assign a value of 1 for the CEODUAL dummy.

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weaker for the UPREITs where insiders hold OP units. None of the results on the relation between firm value and insider ownership or OP units change when I control for board monitoring.

Conclusions

The relationship between insider ownership and firm value is an important but unresolved issue. I contribute to the understanding of this issue by examining panel data on real estate investment trusts (REITs). For REITs, insider ownership is expected to play a crucial role in controlling agency problem because REITs have to satisfy special regulations which weaken or render ineffective alternative mechanisms. Empirically, I find a significant and robust nonlinear relationship between REIT insider ownership and Tobin's Q that is positive at low levels but turns negative at high levels of insider ownership. This is consistent with the trade-off between the incentive alignment and the entrenchment effect of insider ownership.

I conduct additional tests on the relation between firm value and ownership taking advantage of the fact that many modern REITs have the Umbrella Partnership corporate structure. The UPREITs have dual ownership structure: common stocks and Operating Partnership Units (OP units). The unit holders are property owners who have contributed their properties to the UPREITs in exchange for OP units. Their capital gains taxes remain deferred as long as they hold onto their OP units and the UPREIT does not sell the properties they contributed. The unit holders are "locked-in." They have both the incentive and the expertise to monitor the firm management. Consistent with this positive monitoring effect of the OP units, I find that UPREIT's firm value increases with the fraction of OP units.

On the other hand, UPREITs may suffer from additional agency problems, especially when the original property owners stay as executive officers or directors. The tax bases of the property owners are much lower than the common shareholders. This gives rise to a conflict of interests between the two groups concerning a taxable sale of properties. Empirically, I find that the relation between firm value and insider ownership is more positive at low levels but weaker at high levels of insider ownership for the UPREITs where insiders hold OP units. For these UPREITs, the positive relation between firm value and the fraction of OP units is also significantly weaker. These results are consistent with the additional trade-off between the positive monitoring effect of OP units and the tax-induced agency costs in UPREITs.

The results in this paper confirm that REIT ownership structure has important impact on corporate value. My findings contribute to a better understanding of the REIT valuations. They should be of interest to investors and portfolio managers in making their asset allocation decisions, and help REIT managers in making corporate structure decisions.

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