Network Connections in REIT Markets

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Abstract
Relationships play a central role across the spectrum of real estate transactions. To better understand the role of relationships in real estate markets, we examine how the connectedness of REIT directors is associated with deal making, growth, and profitability. We find strong evidence that REIT connections are positively associated with both deal making and accounting-based measures of profitability; however, those relationships do not translate into better market returns or higher valuations. One explanation of these somewhat contradictory results is that connections also increase firm risk. Preliminary support for this conjecture is found through our examination of each firm's implied cost of equity capital. Specifically, we find increasing connectedness is associated with a higher cost of equity capital. Thus, connections appear to offer both advantages and disadvantages to REIT managers and shareholders.

Real estate is a business of relationships. One critical avenue through which strong relationships may materially influence firm operations and enterprise value is through enhanced deal making opportunities. While "deal making" is often narrowly defined within the context of real property acquisition and disposition decisions, we examine "deals" from a broader perspective. Specifically, we posit that negotiating the purchase of a new property, raising capital with banks and other creditors, interacting with local governments and communities regarding the development or redevelopment of properties, and the acquisition and disposition of properties all represent various forms of deal making. Across each of these dimensions, a firm's connections might offer a comparative advantage, and may thus have the potential to add value to the firm.

Social and economic connections are a central feature of virtually all economic activities (Larker, So, and Wang, 2011), and most individuals have anecdotal evidence of the adage that "who you know" is as important as "what you know." For example, connections can facilitate information flow, which helps to mitigate information asymmetries between counterparties. This, in turn, can lead to better deals that enhance firm value. On the other hand, deal making just for the sake of doing a deal could be detrimental to firm value. If increased connectedness allows executives to empire build and invest in suboptimal projects, then well-connected firms might exhibit worse performance. As a result, the role connectedness plays in the real estate investment trust (REIT) market remains an open empirical question in need of further examination.

In this paper, we begin that process by examining how REIT connections are associated with deal making, growth, and profitability. As noted by prior researchers, real estate markets can be characterized as complex, illiquid, and uncertain, with high information asymmetry, high asset specificity, and incomplete contracting (e.g., Vosselman and van der Meer-Kooistra, 2006; Greenberg, Greenberg, and Antonucci, 2008; Freybote and Gibler, 2011). Thus, real estate markets offer a natural setting in which to examine the role of connectedness. A well-connected real estate firm may perform better because its managers learn about properties, potential deals, and/or tenant desires before their competitors. Similarly, having strong relationships with bankers and other funding sources also has clear advantages when developing or purchasing real estate, as enhanced access to capital may facilitate project acquisition and/or completion. Thus, connections that allow access to better or more timely information could easily translate into better deal making and performance. Alternatively, as mentioned above, connections may facilitate empire building, as enhanced access to capital may lead real estate firms to purchase or invest in suboptimal properties to increase the size of their firm.

Throughout the current investigation, we focus our analysis on two primary questions. First, are REIT connections beneficial to the deal making process? Although we cannot directly measure each of the individual deals evaluated, rejected, and completed by REITs, we employ several proxies for deal making activity and firm structures that are conducive to such actions. More specifically, we examine whether the firm participates in the actual physical development of properties (as opposed to simply operating and managing existing structures) and the dollar values associated with that development, whether the firm is organized as an umbrella partnership or UPREIT (which facilitates tax advantaged property acquisitions by the organization), and the lines of credit available to the firm (as lines of credit are often used as a temporary funding source for real property acquisitions until permanent financing can be arranged). Previewing our results along this dimension, we find that connectedness exerts a positive influence on REIT deal making, as firms with more connections develop more properties, have higher lines of credit, and are more likely to be organized as an UPREIT.

The second question we address is: Does the positive relation between deal making and connectedness lead to better performance? While we find no evidence of a positive relation between funds from operations (FFO) and REIT connections, we do find that REITs with more connections have better performance as measured by both net operating income (NOI) and gains on real estate sales. At the same time, although REIT connections appear to be associated with accounting performance measures, we fail to find any evidence that connections are linked to enhanced market performance.

While the opacity of the deal making process makes it difficult to disentangle the effects of connections on performance, these seemingly paradoxical results may well be driven by our final finding. Specifically, we find evidence that the cost of equity capital (estimated at the firm level) is positively related to connectedness. That is, our results suggest REIT connections enhance deal making opportunities and accounting profitability, but these benefits appear to be offset by higher capital costs for well-connected entities. The net effect of no influence on market performance may well

be indicative of concerns about managerial empire building and/or increased risk-taking.

Understanding the role that connectedness plays in REIT deal making and performance is an important step toward a better understanding of how managers add value in real estate markets. The relation between connectedness, deal making, and performance is also important to boards of directors who monitor and advise management, and ultimately deliver value to shareholders.

The remainder of the paper is organized as follows. We review the relevant literature on the linkages between social networks, board connections, and firm performance across non-REIT firms. We then outline the data and methodology we employ to examine these relations within real estate markets. The results are then presented, followed by a summary of our main findings. The paper closes with our concluding remarks.

LITERATURE REVIEW

The role and importance of social networks and professional connections in corporations has been examined from a variety of viewpoints. For example, Larker, So, and Wang (2011) find firms with boards that are centrally located within the network of firm boards and directors earn superior risk-adjusted stock returns. In their study, connections lead to informational advantages, as connected directors are privy to more information as well as inside views of trends, market conditions, and possible regulatory changes, all of which lead to superior performance. They argue that performance may also be enhanced through connections by reducing information asymmetry when contracting, and through the spread of best practices between firms.[1]

Others have examined the spread of information through corporate networks. Chiu, Teoh, and Tian (2010) find the probability that a firm engages in earnings management doubles when the firm shares a director with another firm that engages in earnings management. Similarly, Bizjak, Lemmon, and Whitby (2009) provide evidence that option backdating spreads through director connections. While these two papers demonstrate the potential negative impacts of connections on a firm, Fracassi and Tate (2012) find that more connected firms tend to have better performance.

Related work includes studies focusing on the role of firm connections and structure in corporate governance (Anglin, Edelstein, Gao, and Tsang, 2001; Coles and Hoi, 2003; Fich and Shivdasani, 2007; Ertimur, Ferri, and Stubben, 2010; Striewe, Rottke, and Zietz, 2013), the impact of CEOs serving as outside directors on each other's board (interlocks) on CEO compensation (Hallock, 1997; Barnea and Guedj, 2009; Hwang and Kim, 2009), the role of school connections on information gathering (Cohen, Frazzini, and Malloy, 2010; Fracassi and Tate, 2012), and how director connections affect labor market outcomes (Engelberg, Gao, and Parsons, 2010; Cashman, Gillan, and Whitby, 2013).

Somewhat surprisingly, given the importance of relationships in complex and illiquid asset markets, there has been limited work directly examining the role of connections

in either the REIT or broader real estate markets. To summarize the findings of these limited existing studies, Garmaise and Moskowitz (2003) find commercial real estate property brokers' informal networks with lenders facilitate client access to bank loans, while Freybote and Gibler (2011) argue that trust is critical in the monitoring and outsourcing of corporate real estate functions (such as location and site selection, lease negotiation, and property management).[2] Focusing on general board structure and governance, Ghosh and Sirmans (2003) find independent directors have a positive, but weak, impact on firm performance, while finally, Hartzell, Sun, and Titman (2006) report that better governed REITs make better investment choices.

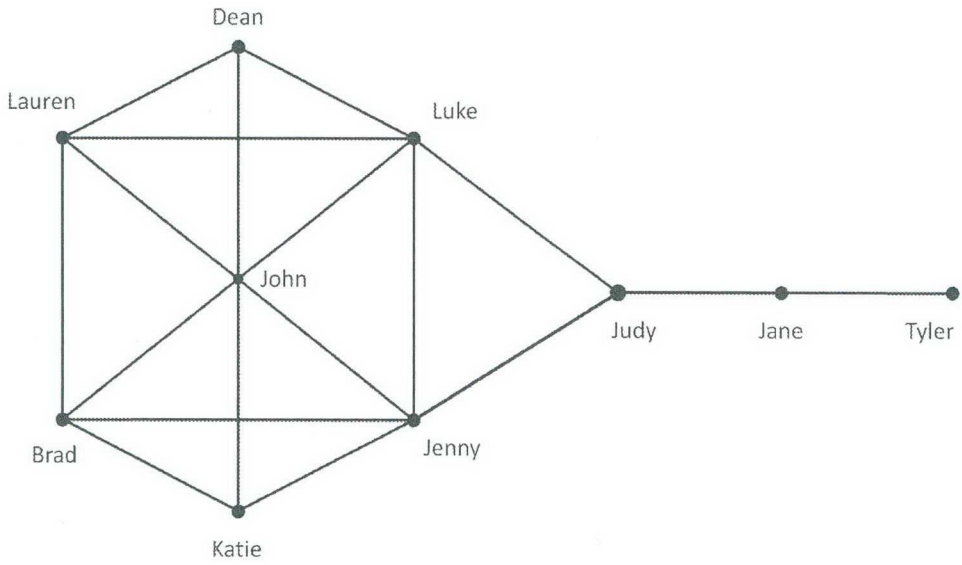
While researchers are only beginning to examine the role of connections, the popular press provides examples of how connections facilitate deal making. For example, an article in *The Wall Street Journal* entitled "The Art of Closing the Deal," (October 22, 2012) detailed how ". . . with a deadline looming, Mr. Siffin didn't have the approximately $400 million he needed to close the deal. Running out of extensions to the closing deadline, Mr. Siffin was introduced to Howard Michaels, chairman of the Carlton Group, through his lender, Jay Sugarman, chairman and chief executive of iStar Financial Inc. This timely introduction resulted in the deal being closed in the weeks to come." Given the relative importance of relationships and connections in real estate markets, further analysis of these issues is clearly warranted.

DATA AND METHODS

The data for this analysis come primarily from two main sources: BoardEx and SNL Financial. BoardEx tracks corporate directors and employees and retains information pertaining to gender, citizenship, employment history, and non-profit affiliations. While BoardEx begins coverage of individuals in 1999, some individuals have backfilled information as far back as 1926. BoardEx reports each director's current board appointments, as well as their cumulative time on each board. We use the BoardEx data to determine how connected each director is within each network.

To determine each director's level of connectedness, we construct an annual network of directors based on board appointments, education, and non-profit affiliations. Following prior work by Sabidussi (1966) and Freeman (1977), we extract three measures of connectedness from the network for each director: degree, closeness, and betweeness. Exhibit 1, developed by Krackhardt (1990), depicts the differences between the network measures we use. Degree is simply the number of direct connections an individual has within the network. Examining Exhibit 1, John has the most direct connections and the highest degree value of 6. *Closeness* is formally defined as the normalized reciprocal of the sum of geodesic distances from a given director to all other directors (Sabidussi, 1966), and measures how central a director is in a network by analyzing the length of the paths between a given director and all other directors in the network. The geodesic distance between two members of the network is the shortest number of steps it takes to get from one to the other, so returning to our example the geodesic distance between Brad and Judy is two. Similarly, Luke and Jenny have the highest *Closeness* scores as they can reach members in the network through the fewest steps. *Betweeness* is formally defined as

Exhibit 1
Connectedness Illustration



the normalized number of geodesic paths that pass through a director (Freeman, 1977). *Betweeness* measures the extent to which an individual acts as a conduit to others in the network. For example, the only way for most members of the network depicted in Exhibit 1 to connect with Jane is through Judy. Thus, Judy is "between" Jane and most other members of the network and would have the highest *Betweeness* score.

Interpretation of the various network measures is not always straightforward. For example, while varying measures of closeness can be rank ordered to see which individual is more central in the network, understanding the impact of small changes in closeness through time is challenging. Additionally, while each variable has a distinct interpretation, they are highly correlated, which further complicates the interpretation. Thus, we use a principal components analysis to reduce the social network variables into a single "connectedness" measure for each director in each network each year.[3] As demonstrated in Exhibit 2, the typical REIT connections score ranges from a nearly negative 2 to a positive 5.5. The typical director also serves on two or three boards, with an average tenure of just over seven and a half years in each position.

While BoardEx provides director level information, SNL provides REIT financial and operational details. Specifically, for each firm within our sample, we collect information on their market capitalization, available lines of credit and similar credit facilities, UPREIT status, whether the REIT engages in the physical development of properties, and the dollar value of any such development activities. As noted above, lines of credit are often used as a funding source for real property acquisitions. With regard to UPREIT status, Sinai and Gyourko (2004) argue that the tax advantaged nature of real property contributions to this organizational structure supports REIT

Exhibit 2
Descriptive Statistics

Variable	Mean	Median	Min.	Max.
Accounting Performance				
FFO/Lagged T. Assets	0.061	0.060	−0.155	0.189
NOI/Lagged T. Assets	0.102	0.099	0.003	0.289
Deprec./Lagged T. Assets	0.169	0.148	0	0.916
Gains/Lagged T. Assets	0.210	0.186	−0.037	1.019
Board Attributes				
Connections	0.278	0.102	−1.991	5.476
Time on Board	7.515	7.217	0.500	26.063
Number of Boards	2.571	2.375	1	9.200
Board Size	10.088	10.000	4	23.00
Firm Structure				
LOC Available	0.148	0.136	0	0.793
UPREIT	0.772	1.000	0	1
Development	0.666	1.000	0	1
Development ($)	0.256	0.022	0	3.369
Market-based Metrics				
Market Cap	2,081,902	1,157,225	3,375	22,428,750
Leverage	0.476	0.476	0	0.987
Lagged Return	0.163	0.168	−0.680	1.545
Property Type Focus				
Office	0.175	0	0	1
Other	0.306	0	0	1
Hotel	0.107	0	0	1
Industrial	0.048	0	0	1
Retail	0.242	0	0	1

Notes: This table provides basic descriptive statistics (sample size, mean, standard deviation, minimum, and maximum) for the variables. The Appendix provides a detailed description of how each variable is defined. There are 850 observations.

growth and expansion activities. Finally, development activities require deal making with third parties to acquire land, and coordination with local governments and agencies to acquire the proper permits, zoning approvals, and variances, etc. Thus, we expect connections to be uniquely important to REITs with active development pipelines relative to those which simply own and/or operate existing structures.

We also identify each REIT's property type focus, and capture various dimensions of firm performance including funds from operations (FFO), net operating income (NOI), depreciation allowances, gains (losses) on the sale/disposition of real property assets, and capital market returns. Additionally, we calculate each REIT's leverage (as total debt divided by total debt plus equity market capitalization) and market-to-book (as total debt plus equity market capitalization divided by total assets). Lastly, we match our sample to the Center for Research in Security Prices (CRSP) database to control for the REIT's prior year market return.

Descriptive statistics for each of these attributes are presented in Exhibit 2. Highlighting a few key metrics, our sample includes 850 firm-year observations from 1993 to 2010 and is comprised of 146 unique REITs.[4] The typical REIT in our sample is characterized by a total market capitalization of slightly over $2 billion, with equity values ranging from a low of $3 million in 2008 for HMG/Courtland Properties, Inc. to a high of more than $22 billion in 2006 for Simon Property Group, Inc.[5] Consistent with the findings of Feng, Ghosh, and Sirmans (2007), Boudry, Kallberg, and Liu (2010), and Harrison, Panasian, and Seiler (2011), sample REITs have high debt utilization ratios relative to their non-REIT counterparts, with market leverage ratios approaching 50% on average. Despite these high debt ratios, sample firms appear to retain significant financial flexibility with available lines of credit averaging nearly 15% of total assets. At the same time, these REITs have been robustly profitable over the past decade, with average accounting-based returns exceeding 6% (FFO/Total Assets) to 10% (NOI/Total Assets). More than 77% of the REITs in our sample are UPREITs, while two-thirds of our sample firm-year observations come from firms with active property development pipelines. A breakdown of REITs by property type is also included in Exhibit 2, with the majority categorized as Office, Other (which includes both diversified and specialty REITs), or Retail.

RESULTS

To examine the associations between connectedness, deal making, and performance, we begin our analysis with a univariate comparison between the most connected REITs and the least connected REITs. For each year, we group REITs into terciles based on their level of connectedness and report univariate statistics and tests of differences between the upper and lower terciles. The results of these comparisons are presented in Exhibit 3. Panel A contains univariate comparisons based upon means tests, while Panel B contains a parallel analysis based upon comparisons of medians. As the underlying results are quite similar, we limit our textual discussion to the comparisons of means. We find that REITs in the most connected tercile are characterized by higher values for each of our deal making proxies than REITs in the least connected tercile. More specifically, highly connected REITs have significantly larger lines of credit available (which are commonly used to fund new acquisitions), with a mean of 15.9% of total assets for well-connected REITs compared to a mean of only 13.7% for less connected REITs. Highly connected REITs are also more likely to be organized as an UPREIT (86% vs. 67%), have an active property development pipeline (75% of highly connected REITs participate in development activities compared to only 57% of less connected REITs), and have more dollars directly invested in real property development activities. Each of these differences are both economically and statistically significant. Furthermore, these findings are all consistent with the notion that firm connections are associated with firm structure and enhanced deal making activities and/or opportunities.

When examining our accounting performance metrics, we find funds from operations (FFO), traditionally the most commonly analyzed REIT accounting performance

Exhibit 3
Univariate Tests

Variable	Most Connected Tercile Obs.	Most Connected Tercile Mean	Least Connected Tercile Obs.	Least Connected Tercile Mean	Satterthwaite *T*-test of Differences
Panel A: Means					
Accounting Performance					
FFO/Lagged T. Assets	283	0.062	264	0.062	−0.31
NOI/Lagged T. Assets	283	0.106	264	0.097	2.98***
Deprec./Lagged T. Assets	283	0.190	264	0.162	3.10***
Gains/Lagged T. Assets	283	0.234	264	0.196	3.69***
Board Attributes					
Connections	283	1.150	264	−0.629	27.18***
Time on Board	283	7.440	264	8.049	−1.95*
Number of Boards	283	3.054	264	2.287	7.51***
Firm Structure					
LOC Available	283	0.159	264	0.137	2.37**
UPREIT	283	0.855	264	0.671	5.16***
Development	283	0.753	264	0.572	4.53***
Development ($)	283	0.397	264	0.139	5.86***
Market-based Metrics					
Market Cap	283	2,702,593	264	1,421,240	6.11***
Leverage	283	0.468	264	0.489	−1.26
Lagged Return	283	0.149	264	0.152	−0.15
Property Type Focus					
Office	283	0.187	264	0.216	−0.83
Other	283	0.269	264	0.314	−1.18
Hotel	283	0.085	264	0.152	−2.41**
Industrial	283	0.067	264	0.014	3.43***
Retail	283	0.226	264	0.224	0.07
Panel B: Medians					
Accounting Performance					
FFO/Lagged T. Assets	283	0.060	264	0.060	−1.024
NOI/Lagged T. Assets	283	0.099	264	0.099	1.510
Deprec./Lagged T. Assets	283	0.171	264	0.139	3.662***
Gains/Lagged T. Assets	283	0.209	264	0.176	3.840***
Board Attributes					
Connections	283	1.037	264	−0.343	20.078***
Time on Board	283	7.190	264	7.654	−1.892*
Number of Boards	283	2.867	264	2.000	10.176***
Accounting Performance	283	12.000	264	8.000	9.940***
Firm Structure					
LOC Available	283	0.137	264	0.133	2.001**
UPREIT	283	1.000	264	1.000	5.093***
Development	283	1.000	264	1.000	4.471***
Development ($)	283	0.121	264	0.002	6.982***

Exhibit 3 (continued)
Univariate Tests

Variable	Most Connected Tercile		Least Connected Tercile		Satterthwaite *T*-test of Differences
	Obs.	Mean	Obs.	Mean	
Market-based Metrics					
Market Cap	283	1,777,402	264	655,266	8.635***
Leverage	283	0.470	264	0.486	−1.747*
Lagged Return	283	0.177	264	0.129	0.541
Property Type Focus					
Office	283	0	264	0	−0.834
Other	283	0	264	0	−1.179
Hotel	283	0	264	0	−2.423**
Industrial	283	0	264	0	3.315***
Retail	283	0	264	0	0.074

Note: Panel A (Panel B) provides mean (median) values and univariate tests of differences in means (medians) for all key variables employed, disaggregated by the firm's relative level of connectedness.
* Statistically significant at the 10% level.
** Statistically significant at the 5% level.
*** Statistically significant at the 1% level.

metric, does not appear to vary systematically with connections. However, each of the component pieces that comprise the generic FFO calculation are related to a firm's connections.[6] More specifically, consistent with the view that connections provide valuable information, which enhances firm operating performance, NOI appears to be positively related to our connectedness measure in these univariate comparisons. Similarly, we find that highly connected REITs have higher depreciation allowances. While not causal in nature, this finding is consistent with connections enhancing deal making, as increased expansion and acquisition activities should increase the size of REIT property investment portfolios and thus increase annual depreciation allowances. Finally, we find that firm connections are positively related to recognized gains on the disposition of real property assets, again suggestive of connections potentially adding value. Taken together, our univariate results provide support for the view that connections are associated with enhanced firm level (accounting) performance across multiple dimensions.

Turning to the board attributes in Exhibit 3, not surprisingly, we again find significant differences across the two samples. Given that we condition on connectedness, the observed differential is positive by construction. The fact that the two sample means differ statistically suggests firms exhibit substantial variation along this dimension and provides further justification for studying the link between variation in connectedness, firm structure, and performance outcomes.

Finally, with respect to variation in connections across property type investment focus, industrial REITs appear to have well connected boards, while hotel/lodging properties

appear to be relatively less connected. We offer no explanation for these apparent differences, and leave further examination of this topic to future research. That said, given the potentially disparate role of firm connections across alternative property type segments, property type fixed effects are included throughout our multivariate analyses.

While these univariate comparisons are informative, we recognize the need to control for all factors that may materially influence REIT deal making and performance, to fully understand the role and importance of connections in real estate markets. We therefore estimate multivariate regressions, using our pooled REIT sample, which include each of our board attributes, firm structure characteristics, and market metrics.[7] Our multivariate analysis results on the relation between organizational structure dimensions of deal making and REIT connectedness are reported in Exhibit 4.

In Model 1 of Exhibit 4, we focus on the lines of credit available (*LOC*) as the dependent variable. Given that one of the primary uses of LOCs in REIT markets is to secure new investment properties, having a large credit line is consistent with enhanced deal making opportunities and/or activities. Consistent with our univariate results, we observe that the coefficient on connections is positive (0.017) and significant at the 1% level. Models 2–4 present similar results for additional aspects of organizational structure that are likely related to deal making activity. In Model 2, we focus on the likelihood that enhanced REIT connections increase the probability that the organization will elect an UPREIT structure. The significant positive relation we observe is entirely consistent with both our univariate evidence and the arguments of Sinai and Gyourko (2004) that UPREIT structures foster and support REIT growth and expansion activities. Thus, firm level connections once again appear to be positively related to potential deal making activity. Similarly, when focusing on development activity using an indicator variable in Model 3, or the dollar amount in Model 4, we find that connections are again positively related to our proxies for deal making and significant at the 1% level. While we cannot determine whether connectedness leads to more development, or whether firms with strategies of development appoint more connected directors, it is clear that the choice of a REIT to grow through development is associated with the connectedness of its board of directors.

Controls for size, leverage, board experience, and prior performance are included across all four model specifications, as are fixed effects for the property type focus of the firm's investment activities. In general, these control variables conform to ex ante expectations. Specifically, larger firms are more likely to be organized as UPREITs and to engage and invest more heavily in the property development process. Similarly, consistent with well-established capital structure arguments, larger firms should benefit from enhanced capital market access, and thus, have less need for revolving, temporary credit facilities. Turning to leverage results, lines of credit appear to be a partial substitute for more traditional sources of debt with respect to REIT capital structure decisions. More specifically, highly levered firms appear unable or unwilling to secure such financing arrangements with the same relative magnitude as their more strongly capitalized counterparts. Lastly, board tenure appears to be positively related to firm level participation and investment in development activities,

Exhibit 4
REIT Deal Making and Connectedness

	LOC Available	UPREIT	Development	Development ($000,000's)
	(1)	(2)	(3)	(4)
Intercept	0.292***	0.643	−3.270***	−0.128
	(12.01)	(0.81)	(−4.24)	(−1.08)
Board Attributes				
Connections	0.017***	0.525***	0.485***	0.140***
	(4.10)	(4.04)	(3.97)	(6.02)
Time on Board	−0.002**	−0.117***	0.102***	0.022***
	(−2.07)	(−4.33)	(4.03)	(4.63)
Number of Boards	0.010	−0.398	−0.149	−0.093*
	(0.95)	(−1.13)	(−0.42)	(−1.89)
Boards^2	−0.001	−0.025	−0.056	0.002
	(−1.03)	(−0.52)	(−1.05)	(0.32)
Board Size	−0.000	0.127***	0.102***	0.020***
	(−0.04)	(3.03)	(3.09)	(3.08)
Firm Structure				
LOC Available		−4.171***	2.554**	0.649***
		(−3.88)	(2.44)	(3.90)
UPREIT	−0.034***		0.657***	0.146***
	(−3.85)		(2.97)	(3.06)
Development	0.017**	0.540**		
	(2.19)	(2.38)		
Market-based Metrics				
Market Cap	−0.011***	0.284***	0.309***	0.108***
	(−8.22)	(3.49)	(4.72)	(12.90)
Leverage	−0.194***	4.035***	2.843***	0.568***
	(−9.35)	(5.65)	(4.45)	(4.87)
Lagged Return	−0.000	0.544	−0.311	−0.060
	(−0.04)	(1.32)	(−0.88)	(−1.04)
Prob. Develop				−0.953***
				(−4.82)
Property Type Controls	Yes	Yes	Yes	Yes
Adj. R^2	0.177			0.396
Pseudo R^2		0.279	0.249	

Notes: This table presents the results of our regressions investigating how connectedness influences REIT deal making. In Model 1, we use OLS to examine how connections influence the amount of revolving credit the REIT has access to. In Model 2, we use logistic analysis to examine how connections influence the decision to organize as an UPREIT. In Model 3, we use logistic analysis to examine how connections influence the REIT's decision to engage in development activities. In Model 4, we use OLS to examine how connections influence the dollar amount the REIT invests in development activities. For Models 2 and 3, the intercept represents the probability that a firm will choose an UPREIT organizational form or engage in development activities, respectively, when all dichotomous variables are set equal to zero and all continuous variables are set at their mean. The coefficients reported for the dichotomous variables represent the

Exhibit 4 (continued)
REIT Deal Making and Connectedness

incremental change in the probable choice when the dichotomous variable changes from zero to one, leaving all other variables unchanged. In the case of the continuous explanatory variables, the reported coefficients represent the change in the probability implied by a two standard deviation increase from the mean. There are 850 observations.
* Statistically significant at the 10% level.
** Statistically significant at the 5% level.
*** Statistically significant at the 1% level.

and negatively related to UPREIT status. These findings are perhaps due, at least in part, to the length of the development process for commercial and industrial properties. From this perspective, consistency amongst senior management and executive level decision makers would appear to be a valuable component to the efficient completion of such development activities. With respect to the negative relation between board tenure and UPREIT status, one of the primary advantages of such an organizational structure is the tax advantaged nature of real property contributions to the trust. As new "partners" contribute significant assets to the firm, they may well desire/demand a seat at the table to monitor their investments. Thus, the negative coefficient is consistent with our expectations, and it is not surprising that UPREITs are characterized by shorter average board tenures than their non-UPREIT counterparts.

So far, the evidence appears to support the view that firm connectedness is significantly positively associated with deal making. We next examine whether the relation between connectedness and deal making translates into better performance. While our univariate findings are consistent with higher performance for firms with more connections, we again recognize the need to control for potential correlations across factors that may influence this relation. Specifically, when examining the relation between connectedness and performance, we need to control for the level of deal making by the firm. Exhibit 5 presents the results of regressions where measures of firm performance serve as the dependent variables.

Each of the performance measures is scaled by the prior year's total assets. Column 1 begins our multivariate analysis by examining funds from operations (FFO). As with our univariate results, the coefficient estimate on our connections metric for funds from operations (FFO) in Model 1 exhibits an unexpected negative sign. On the surface, this result suggests that REIT board connections impair firm performance. Within the context of our analysis, this result is likely driven by one of two factors. First, our previous findings suggest that connections enhance deal making activity. It is entirely possible these connections also facilitate empire building by top management rather than value creation for shareholders.[8] Alternatively, as noted in our univariate results, it is also possible that the aggregate nature of reported FFO numbers obscures important insights regarding the true nature of the association between connections and performance.

The results for Models 2–4 provide support for this latter contention. Specifically, for Model 2, REIT connections are positively related to firm profitability as measured by

Exhibit 5
REIT Accounting Performance and Connectedness

	FFO/Lag T Assets	NOI/Lag T Assets	Depreciation/ Lag T Assets	Gains/ Lag T Assets
	(1)	(2)	(3)	(4)
Intercept	0.077***	0.098***	0.058**	0.080***
	(11.06)	(12.25)	(2.25)	(2.72)
Board Attributes				
Connections	−0.004***	0.002*	0.013***	0.019***
	(−3.68)	(1.76)	(3.11)	(4.08)
Time on Board	0.000**	−0.000	0.008***	0.007***
	(2.11)	(−1.49)	(9.30)	(7.28)
Number of Boards	−0.003	0.002	0.020*	0.024**
	(−0.89)	(0.71)	(1.82)	(2.00)
Boards^2	0.001*	−0.000	−0.002	−0.003*
	(1.84)	(−0.44)	(−1.55)	(−1.91)
Board Size	0.001**	0.002***	0.003**	0.004***
	(2.47)	(4.59)	(2.41)	(2.80)
Firm Structure				
LOC Available	0.040***	0.048***	0.119***	0.127***
	(4.40)	(4.60)	(3.49)	(3.28)
UPREIT	0.000	0.004	−0.001	0.003
	(0.14)	(1.61)	(−0.13)	(0.28)
Development	−0.003	−0.013***	−0.009	−0.019**
	(−1.61)	(−5.68)	(−1.15)	(−2.18)
Market-based Metrics				
Market Cap	0.000	−0.001***	−0.002	−0.003**
	(0.64)	(−2.98)	(−1.40)	(−2.20)
Leverage	−0.073***	−0.053***	−0.078***	−0.058**
	(−12.75)	(−7.93)	(−3.62)	(−2.36)
Lagged Return	0.004	0.011***	0.017	0.024*
	(1.32)	(2.89)	(1.33)	(1.65)
Property Type Controls	Yes	Yes	Yes	Yes
Adj. R^2	0.339	0.252	0.233	0.196

Notes: This table presents the results of our regressions investigating how connectedness influences REIT accounting performance. Specifically, we examine funds from operations (FFO) and its components. In Model 1, we examine how connections influence a firm's FFO. In Model 2, we examine how connections influence the firm's net operating income (NOI). In Model 3, we examine how connections influence annual depreciation expenses/allowances. In Model 4, we examine how connections influence gains on the disposition of real property assets. There are 850 observations.

* Statistically significant at the 10% level.

** Statistically significant at the 5% level.

*** Statistically significant at the 1% level.

net operating income (NOI). That is, connections appear to enhance the ability of firms to efficiently lease, manage, and operate their facilities. Additionally, for Model 3, connections are positively related to firm depreciation allowances, suggesting connections may well be related to firm size and/or growth and expansion activities.[9] Lastly, for Model 4, we find gains from the disposition of real property assets are positively related to firm connections. Taken together, the results for Models 2–4 suggest firm level connections assist in the efficient operation of business lines, expedite firm growth and expansion activities, and facilitate the profitable liquidation of real property investments from the firm's portfolio. Each of these factors lead to enhanced accounting-based performance. Thus, the observed negative relation between FFO and connectedness is likely the by-product of the variable's aggregate nature that obscures underlying relations across FFO components.

Of course, while improved accounting performance is desirable, shareholders ultimately care about maximizing their wealth through enhanced market returns. Based on the preceding evidence that connections facilitate deal making and enhance accounting profits, we would anticipate a direct association between firm connections and market-based returns. Oddly, the evidence in Exhibit 6 fails to document such an association.[10] Specifically, we run a traditional one-factor CAPM (market) model of REIT returns against systematic risk (Model 1), capture the residuals, and then examine whether any of our REIT specific attributes are correlated with these market model residuals. To the extent that connections add value in the marketplace, we would anticipate a positive coefficient on our connections metric. Instead, the coefficient estimate is statistically insignificant. As noted in the investments literature, a wide range of potential limitations surround the simple one-factor (market) return model. In Models 2 and 3, we broaden our approach to encompass both the three-factor Fama-French characteristics and the four-factor Carhart momentum-based approaches to measuring abnormal returns.[11] In both instances, we again fail to find any evidence that the market rewards better connected firms with superior returns.[12]

Paradoxically, we are thus left with the conclusion that REIT firm/board connections facilitate deal making and enhance accounting profitability, yet are not explicitly recognized and rewarded in the marketplace. This somewhat unsatisfying result clearly demands further investigation. One potential explanation for such seemingly contradictory results lies in the area of risk analysis and management. For example, if external connections entice managers to participate in deal making activities that increase the overall riskiness and/or volatility of the firm, we would expect to observe the aforementioned pattern of increased deal making activity and accounting profitability without a commensurate increase in market valuations.

To further explore this possibility, we next estimate the implied cost of capital for each sample firm using a modified version of the Ohlson (1995) and Feltham and Ohlson (1995) models.[13] Conceptually, these models view the current market valuation of a firm as the present value of its existing book value plus expected future abnormal earnings. Employing clean surplus accounting and assuming zero future forecast error, the implied cost of equity capital can thus be imputed as the discount rate that equates the firm's current market capitalization to its current book value plus expected future abnormal earnings over a finite period. Following Bernard (1995), we employ

Exhibit 6
REIT Market Performance and Connectedness

	1-Factor Adj. Return	3-Factor Adj. Returns	4-Factor Adj. Returns	Cost of Capital
	(1)	(2)	(3)	(4)
Intercept	0.507***	0.384***	0.323***	0.066**
	(6.46)	(5.74)	(4.71)	(2.25)
Board Attributes				
Connections	−0.011	0.001	0.011	0.011**
	(−0.89)	(0.05)	(1.06)	(2.36)
Time on Board	−0.008***	−0.002	0.001	−0.002*
	(−2.91)	(−0.79)	(0.52)	(−1.69)
Number of Boards	0.003	−0.011	−0.014	−0.035***
	(0.11)	(−0.41)	(−0.51)	(−2.77)
Boards^2	−0.002	0.000	0.001	0.005***
	(−0.37)	(0.12)	(0.33)	(3.09)
Board Size	−0.003	−0.005	−0.005*	0.000
	(−0.81)	(−1.59)	(−1.74)	(0.06)
Firm Structure				
LOC Available	−0.175*	−0.103	−0.022	−0.005
	(−1.71)	(−1.19)	(−0.25)	(−0.14)
UPREIT	0.036	0.026	0.025	−0.007
	(1.39)	(1.18)	(1.11)	(−0.66)
Development	0.017	−0.002	0.009	−0.012
	(0.72)	(−0.12)	(0.44)	(−1.32)
Market-based Metrics				
Market Cap	−0.007*	0.002	0.003	−0.003**
	(−1.74)	(0.56)	(0.87)	(−1.98)
Leverage	−0.597***	−0.539***	−0.456***	0.251***
	(−9.72)	(−10.30)	(−8.50)	(10.53)
Property Type Controls	Yes	Yes	Yes	Yes
Observations	770	770	770	678
Adj. R^2	0.152	0.204	0.173	0.255

Notes: This table presents the results of our regressions investigating how connectedness influences REIT market performance. Specifically, we examine CAPM abnormal returns, Fama and French (1993) three-factor abnormal returns, and Carhart (1995) four-factor abnormal returns, as well as the firm's implied cost of equity capital.
* Statistically significant at the 10% level.
** Statistically significant at the 5% level.
*** Statistically significant at the 1% level.

a three period estimation interval and winsorize estimated values at 3% and 30%.[14] As shown in Exhibit 2, this process yields estimated equity capital costs of 12.4% on average. While it is reassuring that these estimated magnitudes are consistent with ex ante expectations, we are actually more concerned with the relative implied riskiness of each firm as opposed to the actual cardinal values provided by the estimation

procedure. Thus, to the extent our clean surplus accounting and/or perfect foresight assumptions introduce systematic biases into our cost of capital estimates, the resulting impact on our REIT connections metric and relations should be relatively minor.

Examining the results in Model 4 of Exhibit 6 provides interesting and compelling evidence of the relation between REIT connections and firm performance. While our control variables, unsurprisingly, suggest that the firm costs of equity capital are increasing in firm leverage and decreasing in firm size, our more interesting, focal connections variable reveals firm connections are associated with an increased cost of capital. This latter finding helps close the information loop. That is, connections appear to enhance firm deal making opportunities, but management may respond by taking on more, and riskier, projects. While these additional projects enhance accounting-based profitability metrics, the marketplace recognizes the offsetting effects of increased capital costs, resulting in relatively little to no net impact on the market valuation of the firm.[15]

Our findings, that connections are associated with increasing NOI, increased deal making, and with more and riskier projects being undertaken, are similar to the findings of Guner, Malmendier, and Tate (2008). They examine the impact of directors with financial expertise and find that financial expertise has both positive and negative consequences. Specifically, when commercial bankers join boards, external funding increases; however, this is concentrated in firms with good credit and poor investment opportunities. On the other hand, when investment bankers join the board, firms engage in larger debt issuances, but have lower acquisition performance. Both our findings and those of Guner, Malmendier, and Tate (2008) suggest board characteristics that help a firm in one area may have offsetting negative effects along alternative dimensions.

CONCLUSION

The art of the deal has always played an important role in real estate markets. While it is easy to focus attention on the final outcome, there are many factors that play into a real estate transaction coming to profitable fruition. Prices need to be negotiated, funding needs to be secured, zoning variances and permits need to be acquired, etc. Relationships are one factor that plays a central role across the spectrum of real estate deals and transactions. To further explore how relationships or connections influence REIT market transactions, we examine two key questions. First, are REIT connections beneficial to the deal making process? Second, does the observed positive relation between firm level connections and deal making activity lead to enhanced performance? We find robust evidence that firm connections are positively related to proxies for deal making activity. Moreover, after controlling for deal activity, firms with more connections exhibit superior accounting-based operating performance. On the other hand, we also provide evidence that firm connections are associated with an increased cost of equity capital, and that these increasing capital costs are sufficient to offset the observed accounting gains associated with increased deal making activity.

Taken together, our results are consistent with the idea that managers and directors use their connections to enhance deal making activity. While such activity increases

reported accounting profits, it may also lead to offsetting effects associated with empire building and/or suboptimal investment. The connectedness of directors and managers has come under significant scrutiny in recent years. At least for REITs, we find that there are both costs and benefits to having more connected directors as seen through increased access to deal making, better accounting performance, higher capital costs, and little to no net impact on overall market valuations.

APPENDIX

Variable	Description
LOC Available	The ratio of the amount of revolving lines of credit available to total assets, as reported by SNL.
UPREIT	An indicator variable set to 1 if the firm employs an UPREIT organizational structure, 0 otherwise.
Development	An indicator variable set to 1 if the firm engages in investment property development, construction programs, or has an active property development pipeline, 0 otherwise.
Development ($)	The dollar amount the firm has currently invested in the physical development of real property assets.
FFO/L T Assets	The ratio of funds from operations to lagged total assets, as reported by SNL.
NOI/L T Assets	The ratio of net operating income to lagged total assets, as reported by SNL.
Depreciation/L T Assets	The ratio of depreciation to lagged total assets, as reported by SNL.
Gains/L T Assets	The ratio of gains from property dispositions to lagged total assets, as reported by SNL.
Cost of Capital	The implied cost of equity capital derived from the Ohlson (1995) and Feltham and Ohlson (1995) models. For simplicity, we employ a three year estimation interval and assume zero analyst forecast error.
Connections	The aggregate value of the firm's director's social and professional connectedness measures. These metrics encompass three dimensions: degree, closeness, and betweeness.
Market Cap	The year-end market capitalization, as reported by SNL.
Leverage	The ratio of total debt to total debt plus market capitalization, as reported by SNL.
Time on Board	The cumulative number of years the firm's directors have served on the board.
Number of Boards	The cumulative number of directorships held by the firm's directors in the prior year.
Boards^2	The square of the cumulative number of directorships held by the firm's directors in the prior year.
Lagged Return	The firm's equity market return from the prior year.

ENDNOTES

1. We acknowledge the spread of some practices could also be detrimental to the firm (e.g., earnings management).

2. Kimbler and Rutherford (1993) and Gibler and Black (2004) also explore issues relating to corporate real estate outsourcing, although not from a connectivity perspective, while Liu and Liu (2013) examine the economic dependence and financial linkages between landlords and tenants within retail real estate. Lastly, Roulac (1999) investigates corporate headquarters location decisions. To the extent connections facilitate information flow and transfer across firms, they may provide an alternative basis, and further support, for agglomeration theory.
3. We note that using the individual connectedness measures in place of the PCA factors results in qualitatively similar results.
4. We note that our data represents an unbalanced panel. As such, we ensure that our results are not driven by differences between established REITs and new entrants, or failed REITs, by rerunning our analysis on various sub-samples of our data. These untabulated results are consistent with our reported results. Additionally, we note that we obtain similar results when we examine the pre- and post-SOX period.
5. The empirical results that follow are qualitatively robust to the exclusion of all micro-REITs with market capitalizations of less than $50 million.
6. Recall, FFO $\approx$ NOI + Depreciation − Gains on the Disposition of Real Property Assets.
7. We note that all of our test statistics are based on robust standard errors.
8. In unreported tests, we perform preliminary analysis of this possibility by examining the market reaction to the announcement of a capital offering by the firm, and find no evidence of a significant market reaction to these announcements. This is possibly the result of our inability to differentiate between the connected REITs "good" projects, and their empire building projects.
9. Again, we recognize these size and growth aspects of deal making could be either value enhancing or value destroying.
10. Due to data required for Exhibit 6, our sample has been reduced from 850 to 770 firm-year observations for this market-based return comparison. Note that performing our earlier analysis with this smaller sample yields qualitatively similar results.
11. See Fama and French (1993) and Carhart (1995) for additional background and details on these expected return models.
12. Alternative, untabulated results employing changes in (rather than levels of) REIT board connectedness similarly fail to provide evidence that changes in the firm's level of connectivity are rewarded (or penalized) by the market.
13. In unreported tests, we find no evidence of a relation between the cost of debt and connections. This is likely due to the higher levels of leverage employed by connected REITs, as connections could influence the cost of debt thorough two different channels, either by reducing the cost of debt or by increasing the availability of debt financing. Our results suggest that connections increase the amount of debt financing that is available to the firm.
14. While Bernard (1995) uses earnings forecasts for years $t + 1$, $t + 2$, and $t + (3 - 5)$, we employ actual earnings (FFO) for years $t + 1$, $t + 2$, and $t + 3$. For an example of this cost of capital estimation approach applied within REIT markets, see Danielsen, Harrison, Van Ness, and Warr (2014).
15. Note that additional data requirements associated with estimating the firm's cost of capital further reduce our available sample observations to 678 firm-year pairs. As before, performing our previous analysis on this more restrictive subset of the data yields qualitatively similar results.

REFERENCES

Anglin, P., R. Edelstein, Y. Gao, and D. Tsang. How Does Corporate Governance Affect the Quality of Investor Information? The Curious Case of REITs. *Journal of Real Estate Research*, 2011, 33:1, 1–23.

Barnea, A. and I. Guedj. Director Networks. Working paper, University of Texas at Austin.

Bernard, V.L. The Feltham-Ohlson Framework: Implications for Empiricists. *Contemporary Accounting Research*, 1995, 11:2, 733–47.

Bizjak, J.M., M.L. Lemmon, and R.J. Whitby. Option Backdating and Board Interlocks. *Review of Financial Studies*, 2009, 22, 4821–47.

Boudry, W.I., J.G. Kallberg, and C.H. Liu. An Analysis of REIT Security Issuance Decisions. *Real Estate Economics*, 2010, 38:1, 91–120.

Carhart, M.M. On Persistence in Mutual Fund Performance. *Journal of Finance*, 1995, 52:1, 57–82.

Cashman, G., S. Gillan, and R.J. Whitby. Human and Social Capital in the Labor Market for Directors. *Advances in Financial Economics*, 2013, 16, 137–64.

Chiu, P.C., S.H. Teoh, and F. Tian. Board Interlocks and Earnings Management Contagion. *The Accounting Review*, 2013, 88:3, 915–44.

Cohen, L., A. Frazzini, and C. Malloy. Sell-side School Ties. *Journal of Finance*, 2010, 65, 1409–37.

Coles, J.L. and C-K. Hoi. New Evidence on the Market for Directors: Board Membership and Pennsylvania Senate Bill 1310. *Journal of Finance*, 2003, 58, 197–230.

Danielsen, B.R., D.M. Harrison, R.A. Van Ness, and R.S. Warr. Liquidity, Accounting Transparency, and the Cost of Capital: Evidence from Real Estate Investment Trusts. *Journal of Real Estate Research*, 2014, 36:2, 221–51.

Engelberg, J., P. Gao, and C.A. Parsons. The Value of a Rolodex: CEO Personal Network and Compensation. *Review of Financial Studies*, 2013, 26:1, 79–114.

Ertimur, Y., F. Ferri, and S.R. Stubben. Board of Directors' Responsiveness to Shareholders: Evidence from Shareholder Proposals. *Journal of Corporate Finance*, 2010, 16:1, 53–72.

Fama, E.F. and K.R. French. Common Risk Factors in Returns on Stocks and Bonds. *Journal of Financial Economics*, 1993, 33:1, 3–56.

Feltham, G. and J. Ohlson. Valuation and Clean Surplus Accounting for Operating and Financial Activities. *Contemporary Accounting Research*, 1995, 11:2, 689–731.

Feng, Z., C. Ghosh, and C.F. Sirmans. On the Capital Structure of Real Estate Investment Trusts (REITs). *Journal of Real Estate Finance and Economics*, 2007, 34:1, 81–105.

Fich, E.M. and A. Shivdasani. Financial Fraud, Director Reputation, and Shareholder Wealth. *Journal of Financial Economics*, 2007, 86:2, 306–36.

Fracassi, C. and G. Tate. External Networking and Internal Firm Governance. *Journal of Finance*, 2012, 67:1, 153–94.

Freeman, L. A Set of Measures of Centrality Based upon Betweenness. *Sociometry*, 1977, 40, 35–41.

Freybote, J. and K.M. Gibler. Trust in Corporate Real Estate Management Outsourcing Relationships. *Journal of Property Research*, 2011, 28:4, 341–60.

Garmaise, M.J. and T.J. Moskowitz. Informal Financial Networks: Theory and Evidence. *Review of Financial Studies*, 2003, 16:4, 1007–40.

Ghosh, C. and C.F. Sirmans. Board Independence, Ownership Structure and Performance: Evidence from Real Estate Investment Trusts. *Journal of Real Estate Finance and Economics*, 2003, 26:2–3, 287–318.

Gibler, K.M. and R.T. Black. Agency Risks in Outsourcing Corporate Real Estate Functions. *Journal of Real Estate Research*, 2004, 26:2, 137–60.

Greenberg, P.S., R.H. Greenberg, and Y.L. Antonucci. The Role of Trust in the Governance of Business Process Outsourcing Relationships—A Transaction Cost Economics Approach. *Business Process*, 2008.

Guner, A.B., U. Malmendier, and G. Tate. Financial Expertise of Directors. *Journal of Financial Economics*, 2008, 83:2, 323–54.

Hallock, K. Reciprocally Interlocking Boards of Directors and Executive Compensation. *Journal of Financial and Quantitative Analysis*, 1997, 32, 331–44.

Harrison, D.M., C.A. Panasian, and M.J. Seiler. Further Evidence on the Capital Structure of REITs. *Real Estate Economics*, 2011, 39:1, 133–66.

Hartzell, J.C., L. Sun, and S. Titman. The Effect of Corporate Governance on Investment: Evidence from Real Estate Investment Trusts. *Real Estate Economics*, 2006, 34:3, 343–76.

Hwang, B.H. and S. Kim. It Pays to have Friends. *Journal of Financial Economics*, 2009, 93, 138–58.

Kimbler, L.B. and R.C. Rutherford. Corporate Real Estate Outsourcing: A Survey of the Issue. *Journal of Real Estate Research*, 1993, 8:4, 525–40.

Krackhardt, D. Assessing the Political Landscape: Structure, Cognition and Power in Organizations. *Administrative Science Quarterly*, 1990, 35, 342–69.

Larcker, D., E.S. So, and C.C.Y. Wang. Boardroom Centrality and Firm Performance. *Journal of Accounting and Economics*, 2013, 55, 225–50.

Liu, C. and P. Liu. Is What's Bad for the Goose (Tenant), Bad for the Gander (Landlord)? A Retail Real Estate Perspective. *Journal of Real Estate Research*, 2013, 35:3, 1–17.

Ohlson, J. Book Value and Dividends in Security Valuation. *Contemporary Accounting Research*, 1995, 11:2, 661–87.

Roulac, S.E. Real Estate Value Chain Connections: Tangible and Transparent. *Journal of Real Estate Research*, 1999, 17:3, 387–404.

Sabidussi, G. The Centrality Index of a Graph. *Psychometrika*, 1996, 31, 581–603.

Sinai, T. and J. Gyourko. The Asset Price Incidence of Capital Gains Taxes: Evidence from the Taxpayer Relief Act of 1997 and Publicly-traded Real Estate Firms. *Journal of Public Economics*, 2004, 88:7–8, 1543–65.

Striewe, N.C., N.B. Rottke, and J. Zietz. Corporate Governance and the Leverage of REITs: The Impact of the Advisor Structure. *Journal of Real Estate Research*, 2013, 35:1, 103–19.

Vosselman, E.G.J. and J. van der Meer-Kooistra. Changing the Boundaries of the Firm: Adopting and Designing Efficient Management Control Structures. *Journal of Organizational Change Management*, 2006, 19: 318–34.

WSJ Staff. Real Estate News: The Art of Closing the Deal. *The Wall Street Journal*, October 22, 2012.

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