Market Microstructure and Real Estate Returns

Ko Wang, * John Erickson,* George Gau** and Su Han Chan*

This paper examines the Real Estate Investment Trust (REIT) market microstructure and its relationship to stock returns. When compared with the general stock market, REIT stocks tend to have a lower level of institutional investor participation and are followed by fewer security analysts. In addition, REIT stocks that have a higher percentage of institutional investors or are followed by more security analysts tend to perform better than other REIT stocks. Our results seem to confirm Jensen’s (1993, p. 868) proposition that ownership structure (that is, who owns the firm’s securities) affects the value of the firm. Our findings also have implications about the well documented phenomenon that the financial performance of Commingled Real Estate Funds (CREFs) is better than that of REITs.

The financial performance of real estate assets has been a very important, but unsettled issue in the real estate literature. On one hand, Brueggeman, Chan and Thibodeau (1984), among others, show that unsecuritized real estate assets [Commingled Real Estate Funds (CREFs) and the Frank Russell Company return index (FRC)] outperform other financial assets on a risk-adjusted basis. On the other hand, more recent studies report that the stocks of securitized real estate assets [Real Estate Investment Trusts (REITs)] perform comparable to or worse than the stock market.¹

The markedly different financial performances of securitized and unsecuritized real estate assets seem to contradict market efficiency. Geltner (1991), using an assumed appraisal process, suggests that the superior return of CREFs might be caused by the use of appraised values in constructing the return index. Quan and Quigley (1991, p. 141), however, indicate that it is equally easy to specify an

*California State University-Fullerton, Fullerton, CA 92634
**University of Texas-Austin, Austin, TX 78712

¹ See, for example, Chan, Hendershott and Sanders (1990) and Han (1990) for the first type of evidence and Goebel and Kim (1989), Howe and Shilling (1990) and Martin and Cook (1991) for the second type of evidence.
appraisal process that results in a higher variance in the appraisal return series. Whether the appraisal process assumed by Geltner (or others) resembles the process appraisers use in the day-to-day appraisal assignments is still open for debate (also see Giaccotto and Clapp 1992; and Webb, Miles and Guitkey 1992).

An alternative explanation deals with the difference in the market microstructures of securitized and unsecuritized markets (Liu, Grissom and Hartzell 1990). Because the stock market provides liquidity and more readily accessible pricing information regarding the value of traded REIT stocks, the required return on securitized assets should be lower than that of unsecuritized assets in equilibrium. While this explanation seems reasonable, it cannot explain why certain types of REITs under-perform the stock market.

Recently, some practitioners have observed that the lack of institutional investor interest might affect REIT returns. For example, Rudnitsky (1992) observed that Trammell Crow forgave $6.5 million in management fees for its Trammell Crow Equity Partners 1 Fund (a CREF with mostly institutional investors) when the fund performed worse than expected. The company, however, still collects fees from its Trammell Crow Real Estate Investors REIT (most of the 2,900 investors in the trust are individual investors), even though the REIT's stock price dropped from $15 per share in 1985 to approximately $2 per share in 1991. Wang (1992) also observes that money managers serving institutional investors levy advisory fees that are about 20% lower than the fees for typical fund sponsors. It should be noted that a lower advisory fee could improve the financial performance of the fund.

Rudnitsky (1992) and Wang (1992) are not alone in their observations. Wang, Chan and Gau (1992) also report that REIT initial public offerings (IPOs), underwritten by less prestigious underwriters or purchased by predominantly individual investors, are significantly overpriced. In contrast, REIT shares are not overpriced if the shares are underwritten by prestigious underwriters or if some of the shares are sold to institutional investors. Ross and Zisler (1991), using the Goldman Sachs equity REIT index, report that the aggregate REIT return is almost twice that of the unsecuritized FRC and Evaluation Associates index (EAFPI) series. Given the empirical finding that REITs perform comparable to or worse than the stock market, it is obvious that those REITs in the Goldman Sachs equity REIT index must outperform other REITs in the stock market. The Goldman Sachs equity REIT index includes 33 equity REITs and is an index that an investor could actually hold.

Based on the evidence, it seems that certain neglected REITs tend to underperform other more noticeable REITs. The purpose of this study is to examine this issue empirically. Specifically, we are interested in the following two
questions: (1) does the stock market provide the same level of services (such as information dissemination and monitoring mechanism) for REIT stocks as it does for other stocks in the market; and (2) does the market microstructure of REITs affect their returns? Our results have implications for whether the superior performance of CREFs is caused by differences between the market microstructures of REITs and CREFs.

The next section examines the number of security analysts and the percentage of institutional investors that follow REIT stocks. Section three analyzes REIT returns in relation to the number of security analysts that follow REIT stocks and the percentage of institutional investors holding REIT stocks. The last section contains our conclusions.

**Market Microstructure of REITs and the Stock Market**

**Number of Financial Analysts**

Brennan and Hughes (1991) suggest that the broker/analyst is the investors' information source, and that investors will buy securities followed by their brokers/analysts. In other words, security analysts act as information intermediaries affecting investors' holding decisions. Khoo, Hartzell and Hoesli (1993) and Best and Zhang (1993) also use the number of financial analysts to proxy for the level of information available to investors. To analyze whether security analysts, on average, follow REIT stocks as closely as they do other stocks, we gathered information on the number of security analysts following each stock (REITs and all other stocks in the market). To do this, we obtained a list of REITs and all other stocks from pages 3–47 of Appendix B of the 1989 Compustat Industrial Manual (published by Standard and Poor's Corporation). This manual reports the names and SIC codes for a total of 7,235 companies, from which 134 firms are classified as REITs.

Using this list and the Dow Jones News Retrieval (DJNR) database interactively, we obtained the number of security analysts for each company in the manual. The DJNR database reports information provided by Zacks Investment Research Inc. We find that 79.9% of REITs listed on Compustat are not fol-

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1 Zacks Investment Research Inc. is on a mailing list of approximately 185 brokerage firms who provide continuous estimates of earnings for selected firms. The estimates of earnings that Zacks provides to DJNR service are averages of the total number of analysts’ estimates of earnings received by Zacks. The number of analysts on DJNR is the number of analysts reporting estimates to Zacks on the firm for the period. Conversation with Zacks’s staff indicates that the number of financial analysts following individual firms tends to be relatively constant over time. When there is a major event, however, the number of financial analysts may increase.
ollowed by any security analyst. By comparison, only 66.6% of the other stocks listed on Compustat are not followed by any analyst. The gap is even wider if we examine only the stocks traded on the New York Stock Exchange (NYSE) and the American Stock Exchange (AMEX). On these two exchanges, 69.6% of the REITs are not followed by any analyst while 39.4% of other stocks are not followed by any analyst. We also notice that the maximum number of security analysts that follow a particular REIT, is three. For other stocks in the market, approximately 10% of the companies are followed by more than three security analysts (the maximum number of security analysts is 43).

We also analyzed the average number of security analysts for each industrial group (based on Ritter’s (1991) classification). The means of the number of security analysts for REITs and for all other stocks are 0.3 and 2.64, respectively. Except for real estate related businesses (the average number of security analysts is 0.42), all the other groups have an average number of security analysts that is much higher (ranging from 1.35 to 7.00) than that of REITs. The evidence reinforces the finding that security analysts pay less attention to REIT stocks.

**Percentage of Institutional Holdings**

Academic research has long viewed institutional investors as being more informed than individual investors (Lee, Shleifer and Thaler 1991). To analyze whether institutional investors, on average, follow REIT stocks as closely as they do other stocks, we obtained the percentage of institutional holdings for each REIT from Spectrum 3: 13(f) Institutional Stock Holding Reports. We gathered the quarterly institutional holding information for a REIT if: (1) the beginning trading day of the REIT stock was available; and (2) the REIT had at least one institutional investor during the 1979–1990 period. Based on these two criteria, we obtained quarterly holding information for 100 REITs for this period. These holdings were averaged to obtain the annual institutional holding percentage.

We find that the average percentage of institutional holdings of REIT stocks increases from 6.7% in 1979 to 16.2% in 1989. This finding indicates a grow-

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4 Spectrum 3: 13(f) is a quarterly report published after 1975. The survey includes institutions (such as banks, insurance companies, investment companies, pension funds and foundations) with combined equity assets exceeding $100 million. All NYSE and AMEX stocks along with approximately 3,000 OTC stocks are included in the report. For each quarter, the survey also reports the average percentage of institutional holdings of all the stocks in the market.
ing interest among institutional investors in REIT stocks. However, even with this growing interest, the institutional ownership of REIT stocks is still far below that of other stocks. The average institutional holdings for all stocks (including REITs) range from 33.6% to 39.6% during the 1979–1990 period and, on average, is approximately 3.8 times the average holding of REIT stocks. Based on this evidence, we believe that institutional investors have less interest in holding REIT stocks when compared to other stocks.

Size and Property Type

It is possible that the level of institutional holdings and analysts’ attention are correlated with firm size. Colwell and Park (1990) present some evidence to support a reverse small-firm effect using REIT return data during the 1964–1986 period. The type of REIT holding might also affect REIT return behavior; empirical evidence from previous REIT studies indicates that equity REITs might behave differently from mortgage REITs. Given the evidence, there seems to be a need to examine the relationship between the number of security analysts (and the percentage of institutional holdings) and the size and type of REIT.

To calculate the size of individual REITs, we use the market value (calculated as the end of year closing price times the number of shares outstanding) of REIT stocks to proxy for firm size. Since a significant number of REITs in our sample begin to have return and size information after 1985, we only examine the data in the 1985–1989 period. The firm size variable used in the analysis represents the average firm size during this five-year period. To identify the REIT property type, we examined the 1985 and 1986 REIT Fact Books, The State and Course of the 1987 Real Estate Investment Trust Industry, REIT Facts: A Statistical Profile of the REIT Industry in 1988 and the 1989 REIT Sourcebook. It should be noted that REIT property types occasionally change during the period. In such cases, we identified the REIT using its predominant REIT type during the period. One hundred REITs have complete information on all the four variables (percentage of institutional holdings, number of financial analysts, size and REIT type) used in our analysis.

We find that equity REITs have a significantly higher mean number of financial analysts, as well as a higher percentage of institutional investors, when com-

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5 See, for example, Colwell and Park (1990), Wang, Chan and Gau (1992) and Wang, Erickson and Gau (1993). However, for a counter example, see Nelling et al. (1992).

6 The change normally occurs between the mortgage REIT type and the hybrid REIT type or between the equity REIT type and the hybrid REIT type.
pared to mortgage REITs. The mean number of financial analysts for equity REITs is 0.49 while that for mortgage REITs is 0.16 (the \( T-\text{Stat} \) on the difference in means = 2.1). The percentage of institutional investors for equity REITs and mortgage REITs is 16.9% and 7.7%, respectively (the \( T-\text{Stat} \) on the difference in means = 3.2).\(^7\)

We also find that, when the REITs are evenly subdivided into five groups based on their sizes, larger firms tend to have a higher number of financial analysts, as well as a larger percentage of institutional investors. The mean number of financial analysts is a monotonically increasing function of REIT size. The largest REIT group ($144–774 million) has a mean number of financial analysts that is significantly higher than that of all the other four groups \((T-\text{Stat} = 2.7, 3.9, 4.2 \text{ and } 4.7, \text{ respectively})\). The second largest group ($80–142 million) has a significantly larger mean number of financial analysts than that of the fourth group ($20–48 million) and the fifth group \([($1–20 \text{ million}) (T-\text{Stat} = 2.0 \text{ and } 3.0, \text{ respectively})]\). The third group ($50–79 million) also has a mean number of financial analysts higher than that of the fifth group \([($1–20 \text{ million}) (T-\text{Stat} = 1.8)]\).

The larger REITs also tend to have a larger percentage of institutional investors. The largest REIT group ($144–774 million) has an average percentage of institutional investors that is significantly higher than all the other four groups \((T-\text{Stat} = 2.5, 2.1, 6.12 \text{ and } 4.0, \text{ respectively})\). The average percentage of institutional investors of the second largest group ($80–142 million) and the third group ($50–79 million) are significantly higher than that of the fourth group \([($20–48 \text{ million}) (T-\text{Stat} = 2.8 \text{ and } 2.5, \text{ respectively})]\).

To examine whether the number of financial analysts and the percentage of institutional investors are correlated, we separate the REITs into two groups. The first group consists of 25 REITs that are followed by one or more financial analysts, while the second group consists of the remaining 75 REITs that are not followed by any financial analyst. We find that the mean institutional holdings for the first group is 23.1% and 10.3% for the second group \((T-\text{Stat} \text{ for the difference in means } = 4.5)\). We also regress the number of financial analysts on the percentage of institutional holdings using the 100 REITs. The

\(^7\)The reason why more financial analysts follow equity REITs could be due to the difficulty in forecasting their earnings estimates. Howe and Shilling (1988) propose that the future cash flows and the risk level of mortgage REITs are relatively easy to forecast because mortgages are typically created with fixed coupon payments and are secured by real properties; however, it is much harder to forecast expected rents and vacancies of real property investments.
coefficient of the number of financial analysts is a significant 7.3 (T-Stat = 4.2). Our evidence indicates that financial analysts tend to follow REIT stocks with higher institutional holdings. This finding makes intuitive sense; financial analysts have an incentive to follow firms with large institutional holdings because the demand for their services largely comes from institutional clients.

**REIT Market Microstructure and Stock Performance**

In the previous section, we report that there are fewer institutional investors holding REIT stocks. We also find that there are fewer security analysts following REIT stocks. This section investigates whether these factors affect individual REIT returns. We calculate the monthly stock return using the ending stock price and dividend information provided in the 1989 Compustat Price, Dividends and Earnings (PDE) tapes. To be included in the REIT return sample, a REIT must have at least 36 continuous monthly returns and transaction data. Ninety-four REITs on the Compustat tapes have complete information for the analysis. Following Chan, Hendershott and Sanders (1990), we also analyze REIT returns using different sub-periods. The 1970–1989, 1980–1989 and 1985–1989 periods are used for our analysis.

The four performance measures used to measure REIT returns are: (1) Jensen’s measure (adjusted for systematic risk); (2) the market-adjusted return (not adjusted for risk); (3) the excess return (the risk premium); and (4) Sharpe’s measure (adjusted for total risk). The NYSE equally-weighted return (obtained from the CRSP NYSE/AMEX tape) is used as a proxy for market return. The monthly return on 30-day Treasury bills (obtained from the CRSP U.S. Government Bond file) is used as a proxy for the risk-free rate. Using simple regression, each of the four performance measures is regressed separately on the number of security analysts or the average percentage of institutional holdings. These three regressions are repeated for each of the three periods (1970–1989, 1980–1989 and 1985–1989) examined. The number of observations (monthly returns) for each REIT varies depending on the maturity of the company and on data availability. However, most REITs in the 1985–1989 period have a similar number of observations (60 months).

Panel A of Table 1 reports the regression results when the Jensen’s alpha is used as the dependent variable for the regressions. For each period, we ran two separate equations. Equation 1 uses the number of security analysts as the independent variable and equation 2 uses the percentage of institutional investors as the independent variable. For each regression equation, we report

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* The names of these 94 REITs are available, from the authors, upon request.
Table 1  ▫ Regression results using various stock performance measures (× 1000) of 94 REITs as dependent variables and using the number of financial analysts and the percentage of institutional investors as independent variables in 1970–1989, 1980–1989 and 1985–1989 periods.*

<table>
<thead>
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<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>1</td>
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<tr>
<td># of financial analysts</td>
<td>5.9</td>
<td>.2</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td>(3.8)**</td>
<td>(2.3)**</td>
<td>(3.8)**</td>
</tr>
<tr>
<td>% of institutional investors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.2</td>
<td>.02</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>(2.3)**</td>
<td>(2.3)**</td>
<td>(2.4)**</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.13</td>
<td>.06</td>
<td>.14</td>
</tr>
</tbody>
</table>

Panel A: Using Jensen’s measure as the dependent variable*

| # of financial analysts | 5.9  | 6.0  | 5.6  |
|                        | (3.8)** | (3.8)** | (3.1)** |
| % of institutional investors | 0.2  | 0.2  | 0.3  |
|                        | (2.3)** | (2.4)** | (2.9)** |
| $R^2$       | .13  | .14  | .10  |

Panel B: Using market-adjusted return as the dependent variable*

| # of financial analysts | 5.9  | 6.1  | 5.8  |
|                        | (3.6)** | (3.7)** | (3.1)** |
| % of institutional investors | 0.2  | 0.2  | 0.2  |
|                        | (1.9) | (2.1)** | (2.9)** |
| $R^2$       | .12  | .13  | .10  |

Panel C: Using excess return as the dependent variable*
<table>
<thead>
<tr>
<th>Equation</th>
<th>1970–89 period&lt;sup&gt;b&lt;/sup&gt;</th>
<th>1980–89 period&lt;sup&gt;c&lt;/sup&gt;</th>
<th>1985–89 period&lt;sup&gt;d&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>1</td>
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<tr>
<td>Panel D: Using Sharpe's measure as the dependent variable&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
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<tr>
<td># of financial analysts</td>
<td>86.5</td>
<td>92.2</td>
<td>78.7</td>
</tr>
<tr>
<td></td>
<td>(4.9)**</td>
<td>(5.1)**</td>
<td>(3.9)**</td>
</tr>
<tr>
<td>% of institutional investors</td>
<td>3.1</td>
<td>3.3</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>(2.7)**</td>
<td>(2.8)**</td>
<td>(3.9)**</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.21</td>
<td>.07</td>
<td>.22</td>
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<td></td>
<td></td>
<td>.08</td>
<td>.15</td>
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<td></td>
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<td>.15</td>
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</tbody>
</table>

<sup>a</sup> Monthly volume and return data are derived from the 1989 Compustat PDE tapes. Each REIT has at least 36 monthly return. $T$-Statistics are reported in parentheses.

<sup>b</sup> The number of observations is 94.

<sup>c</sup> The number of observations is 93.

<sup>d</sup> The number of observations is 90.

<sup>e</sup> Jensen's measure is the alpha when the excess return is regressed on the risk premium. The NYSE equally-weighted return is the market return.

<sup>f</sup> The market-adjusted return is the mean REIT return minus the mean market return. The NYSE equally-weighted return is used as the market return.

<sup>s</sup> The excess return is the mean REIT return minus the mean risk-free rate. The one-month treasury bill return is used as the risk-free rate.

<sup>n</sup> Sharpe's measure is the excess return divided by the standard deviation of the REIT return.

* Significant at the 5% level.

** Significant at the 1% level.
the slope coefficient, the $T$-Stat of the independent variable and the $R$-square of the equation. Panels B, C and D report similar information, except that the dependent variables are the market-adjusted return, the excess return and Sharpe’s measure, respectively. The regression results are interesting. For all three periods examined, both the number of security analysts and the percentage of institutional holdings are positively correlated with the stock performance of REITs. The result is very strong: most of the coefficients are significant at the 1% level. The positive relationships hold regardless of whether and how we adjust for the risk in the stock returns.

To check the robustness of our findings, we perform similar analyses using REIT portfolio returns. To do this, we first subdivide the REITs into portfolios categorized by the number of financial analysts and the percentage of institutional holdings. For the number of financial analysts category, we construct three portfolios using REITs with two or more financial analysts, one financial analyst and no financial analysts. For the percentage of institutional holdings category, we evenly divide the REIT sample into three portfolios based on the ranking of the percentage of institutional holdings.\textsuperscript{9} We calculate the Jensen’s alphas for these six portfolios (three for the financial analysts category and three for the percentage of institutional holdings category) for each of the three periods (1970–1989, 1980–1989 and 1985–1989). We then use the Chow test to test for the difference in the Jensen’s alphas, between those portfolios, for each of the three periods.

For all three periods, the Jensen’s alphas are significantly different between the two-and-three financial analysts group and the no financial analysts group. The $F$-ratio for the 1970–1989, the 1980–1989 and the 1985–1989 periods is 3.3, 6.8 and 10.6, respectively. For the percentage of institutional holdings category, the Jensen’s alpha of the highest percentage group is significantly different from the lowest percentage group for the 1980–1989 and the 1985–1989 periods ($F$-statistics = 3.3 and 6.1, respectively). Our analysis using REIT portfolio returns supports our findings using individual REIT returns.

Given the evidence that larger REITs and equity REITs tend to have a larger financial analysts following, as well as a higher percentage of institutional holdings, we examine whether property type and REIT size affect our findings. Because of data limitations, the traditional portfolio rebalancing strategy (to rebalance the portfolio every year based on individual REIT size) is not feasible. Given the constraint, we have to categorize REITs by their size at the

\textsuperscript{9} It should be noted that fewer REITs are available in the initial periods to calculate portfolio returns.
beginning of the return series and assume that the relative size of the REITs does not change much over the return period. Because of the need to align the REIT return series using the REIT size at the beginning of the return period, we only analyze the REIT returns using the 1985–1989 period.

Table 2 reports the regression results using various stock performance measures (panel A to panel D) as dependent variables and using REIT type, size, the number of financial analysts and the percentage of institutional investors as independent variables. Equation 1 regresses REIT returns on property type and the number of financial analysts. Equation 2 regresses REIT returns on REIT size and the number of financial analysts. Equation 3 regresses REIT returns on property type, size and the number of financial analysts. Equation 4 regresses REIT returns on property type and the percentage of institutional investors. Equation 5 regresses REIT returns on REIT size and the percentage of institutional investors. Equation 6 regresses REIT returns on property type, size and the percentage of institutional investors. Again, the overall results confirm the finding that REITs are followed by more financial analysts and REITs with a higher percentage of institutional investors tend to perform better regardless of the return measure used in the analysis. The coefficients of the number of financial analysts and the percentage of institutional holding variables are mostly positive and significant at the 5% level after we hold REIT size and REIT property type constant. It should be noted that some of the coefficients of the size variables in the equations are positive and marginally significant. This result provides some support to Colwell and Park’s (1990) finding that a reverse size effect for REIT returns exists in many months during the year.

Our finding that the more neglected (by security analysts and institutional investors) REIT stocks tend to under-perform the more noticeable REIT stocks seems to contradict the prediction of an equilibrium model. In an equilibrium model, a REIT with less available information (from security analysts) and less monitoring activity (by institutional investors) should command a higher return to compensate for increased risk. Interestingly, however, our result might be quite consistent (in spirit) with Howe and Shilling’s (1990) empirical finding and Jensen’s (1993) proposition that ownership structure affects the value of the firm.

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10 We cannot use the average size, or the size at the end of the return series, as a proxy for firm size because it will bias the result. This bias arises because size is a function of the stock price over time. Ceteris paribus, a firm with a higher stock price might show a higher stock price appreciation during the return period.

11 Interestingly, Nelling et al. (1992) also suggests that the low liquidity of small REITs does not appear to be compensated for by superior performance (see their footnote 5).
Table 2 □ Regression results using various stock performance measures (×1000) of 90 REITs as dependent variables and using the REIT type, size, the number of financial analysts, and the percentage of institutional investors as independent variables in the 1985–1989 period. T-Statistics are reported in parenthesis.

<table>
<thead>
<tr>
<th>Equation</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<tbody>
<tr>
<td>Panel A: Using Jensen’s measure as the dependent variable*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equity REIT</td>
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<td>2.6</td>
<td>2.0</td>
<td>2.2</td>
<td>(0.8)</td>
<td>(0.9)</td>
</tr>
<tr>
<td>Size</td>
<td>2.1</td>
<td>2.1</td>
<td>2.3</td>
<td>2.3</td>
<td>(1.5)</td>
<td>(1.5)</td>
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<tr>
<td>Number of financial analysis</td>
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<td>4.5</td>
<td>4.1</td>
<td>(2.7)**</td>
<td>(2.1)*</td>
<td>(1.9)</td>
</tr>
<tr>
<td>Percentage of institutional investors</td>
<td>0.3</td>
<td>0.2</td>
<td>0.2</td>
<td>(2.5)*</td>
<td>(2.0)*</td>
<td>(1.7)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.10</td>
<td>.11</td>
<td>.12</td>
<td>.08</td>
<td>.11</td>
<td>.11</td>
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<tr>
<td>Panel B: Using market-adjusted return as the dependent variable*</td>
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<tr>
<td>Equity REIT</td>
<td>2.4</td>
<td>2.5</td>
<td>1.9</td>
<td>2.2</td>
<td>(0.9)</td>
<td>(0.9)</td>
</tr>
<tr>
<td>Size</td>
<td>2.1</td>
<td>2.2</td>
<td>2.3</td>
<td>2.3</td>
<td>(1.7)</td>
<td>(1.7)</td>
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<tr>
<td>Number of financial analysts</td>
<td>5.3</td>
<td>4.3</td>
<td>3.9</td>
<td>(2.8)**</td>
<td>(2.2)*</td>
<td>(2.0)*</td>
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<tr>
<td>Percentage of institutional investors</td>
<td>0.3</td>
<td>0.2</td>
<td>0.2</td>
<td>(2.6)**</td>
<td>(2.1)*</td>
<td>(1.8)</td>
</tr>
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<td>$R^2$</td>
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<td>.13</td>
<td>.09</td>
<td>.12</td>
<td>.13</td>
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<td>Panel C: Using excess return as the dependent variable*</td>
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<td>Equity REIT</td>
<td>2.5</td>
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<td>2.1</td>
<td>2.4</td>
<td>(0.9)</td>
<td>(1.0)</td>
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<td>2.3</td>
<td>2.4</td>
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<td>(1.7)</td>
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<tr>
<td>Number of financial analysts</td>
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<td>4.0</td>
<td>(2.8)**</td>
<td>(2.2)*</td>
<td>(2.0)*</td>
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<tr>
<td>Percentage of institutional investors</td>
<td>0.3</td>
<td>0.2</td>
<td>0.2</td>
<td>(2.6)**</td>
<td>(2.1)*</td>
<td>(1.8)</td>
</tr>
<tr>
<td>$R^2$</td>
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<td>.13</td>
<td>.13</td>
<td>.09</td>
<td>.12</td>
<td>.13</td>
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### Table 2 (continued)

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<td><strong>Panel D: Using Sharpe’s measure as the dependent variable</strong>&lt;sup&gt;d&lt;/sup&gt;</td>
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<tr>
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<td>(1.4)</td>
<td>(1.5)</td>
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<td>(3.5)**</td>
<td>(3.1)**</td>
<td>(2.7)**</td>
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<tr>
<td>Percentage of</td>
<td>4.1</td>
<td>3.9</td>
<td>3.4</td>
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<td>institutional investors</td>
<td>(3.4)**</td>
<td>(3.1)**</td>
<td>(2.7)**</td>
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<td>$R^2$</td>
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<td>.17</td>
<td>.19</td>
<td>.16</td>
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<td>.19</td>
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* Jensen’s measure is the alpha when excess return is regressed on the risk premium. The NYSE equally-weighted return is the market return.

b The market-adjusted return is the mean REIT return minus the mean market return. The NYSE equally-weighted return is used as the market return.

c The excess return is the mean REIT return minus the mean risk-free rate. The one-month treasury bill return is used as the risk-free rate.

d Sharpe’s measure is the excess return divided by the standard deviation of the REIT return.

* Significant at the 5% level.

** Significant at the 1% level.

Howe and Shilling report (in their Table 1) that, among the seven advisor groups, the Jensen’s measures are lower for REITs advised by "Not Known," "Individual" and "Mortgage Banker" groups and are higher for REITs advised by "Insurance Company," "Real Estate Advisor" and "Other" groups. It is quite reasonable to infer that REITs advised by the "Not Known" and the "Individual" groups might be less noticeable in the REIT stock market than those REITs advised by the "Insurance Company" and "Real Estate Advisor" groups.

Jensen (1993) proposes that active investors (pension funds, insurance companies, mutual funds, banks and money managers) are important for a firm to establish a well-functioning governance system because active investors have the financial interest and the ability to monitor the firm’s management and
policies. (The definition of Jensen's active investors is very similar to the
definition of institutional investors used by Spectrum 3:13(f).) Indeed, when
a firm is monitored by a group of active investors, it is more likely that the
firm will correct its management problems. Our result provides some support
for Jensen's proposition that the ownership structure of the firm affects its
organizational efficiency, cash flow and value.

Our findings have implications for the puzzle of why CREFs outperform
REITs. It should be noted that buyers of CREFs are predominately institutional
investors. The widely publicized Russell-NCREIF property index (formerly the
Frank Russell Company property index) provides a readily available benchmark
for institutional investors to compare the performances of fund managers.
Given Rudnitsky's (1992) finding that Trammell Crow provides management
fee relief to its real estate commingled fund (comprised mostly of institutional
investors), but not to its real estate investment trust (comprised mostly of
individual investors), it is quite possible that the differing financial perform-
ances of securitized and unsecuritized real estate assets are caused by differ-
ences in their clienteles and the monitoring ability of their investors.

Conclusion

This paper examines REIT market microstructure and its relationship to REIT
stock returns. When compared to the rest of the stock market, we find that
REIT stocks, on average, have a lower level of institutional investor partici-
pation and are followed by fewer security analysts. This result indicates that
REIT stocks may not enjoy the full benefits of securitization as we have pre-
viously believed. We further find that the stock performance of each individual
REIT is positively correlated with the number of security analysts following
the REIT stock and with the level of institutional participation. In other words,
a REIT tends to perform better if there is more information (from security
analysts) about the security and if there are more informed stockholders (in-
stitutional investors) monitoring the performance of its stock. This result seems
to confirm Jensen's (1993, p. 868) proposition that the ownership structure
(that is, who owns the firm's securities) affects the value of the firm.

We suspect that the under-performance of REITs could be caused by the
agency problems prevailing in the real estate security market.12 Weiss (1989)
contends that closed-end fund shares at the IPO stage are aggressively sold to
(not bought by) individual investors. Wang, Chan and Gau (1992) also report

12 For a good discussion of agency issues and how real estate securities are aggressively
sold to individual investors, see Bernstein (Business Week, February 1990).
that overpriced REIT IPO shares are sold primarily to individual investors and that the overpriced securities are underwritten by less prestigious underwriters. Indeed, if an overpriced security is aggressively sold to uninformed investors who have little information about the true value of the security at the initial offering stage (see Elton, Gruber and Rentzler 1989), the security price inevitably falls when the true financial performances of the firms are revealed to the market at a later stage. If this argument is true, the under-performance of REIT stocks could be caused by fads in the initial public offering and early aftermarket trading stages (Ritter 1991).

Given current empirical evidence, it is difficult to judge whether the agency cost and fad explanations describe reality. However, our findings that REIT market microstructure is unique and that a REIT's return is correlated with its market microstructure point out new dimensions that researchers may consider when modeling real estate asset returns. More interestingly, the finding that the stock performance is better for better-known REITs seems to support Jensen’s (1993) proposition that ownership structure affects the value of the firm. Our results might also have implications for the long-standing puzzle on why CREFs outperform REIT stocks.

We acknowledge helpful comments from Tsong-Yue Lai, Yuming Li, K.C. Ma, John Martin, Laura Starks, Dogan Tirtiroglu, Sheridan Titman, Joseph Williams and participants in the University of British Columbia workshop. We would like to express our special thanks to two anonymous referees and the editor James Shilling who provided specific comments that improved the paper. Earlier versions of this paper were presented at the 1993 American Real Estate and Urban Economics Association Meetings and the 1993 FMA Meetings. The research assistance of Vladislav Chernyshev, Greg Hallman and Jaafar Salwani is greatly appreciated.

References


Han, J. 1990. Did REITs Really Outperform the Stock Market Portfolio? Working Paper. MIT.


