

Real Estate Returns in Public and Private Markets

The NCREIF Property Index

understates the return

volatility of commercial

properties.

PRIOR TO THE 1990S, commercial real estate was undoubtedly the largest business sector in the country, perhaps the world, that raised almost none of its equity or debt capital in the public markets. In 1990, the stock market capitalization of all equity real estate investment trusts (REITs) was barely \$5 billion. And, less than \$15 billion of commercial mortgage-backed securities (CMBS) were issued throughout the 1980s, with just \$3.4 billion issued in 1990. Given that the size of the commercial property base was many trillions of dollars, CMBS and REITs represented a tiny fraction of the income-producing property market.

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At that time, there was no liquid exchange for transactions to provide investors with information on market prices and returns for commercial real estate. Given the increasing interest in real estate by institutional investors during the 1980s, researchers began to employ a variety of methods to estimate real property returns. These ranged from hedonic price estimates from a small sample of traded properties to impute values and returns on properties being held (but not traded) by institutional investors, to attempts to construct synthetic return series by applying cap rate data to the rental income flows on institutionally owned properties.

The most widely used appraisal-based return series in the real estate industry is compiled by the National Council of Real Estate Investment Fiduciaries (NCREIF). Since the first quarter of 1978, NCREIF has produced an index of quarterly returns on commercial properties held for tax-exempt institutional investors by members of that organization. The index is carefully compiled under consistent standards, and represents a large portfolio of properties held (or managed) by many of the leading institutional investors in the United States. As of the end of 2002, the NCREIF Property Index contained 3,680 properties across all property types and regions, with an appraised value of \$121.9 billion. Researchers have highlighted the extremely low volatility of returns on this series, as

well as the strong serial correlation of the data. While they have suggested ways to cleanse the returns of appraisal-induced smoothing, the fact remains that information from this series is not transactions-based, and as such, does not represent the true performance of arm's-length trading of properties.

The early studies of equity REIT returns, which are transactions-based, revealed no contemporaneous correlation with appraisal-based real estate returns. In fact, equity REIT returns more closely resembled the broader stock market than they did the NCREIF Property Index. This generated an extensive debate within the real estate industry about the true risk and return profile of commercial property. A 1992 *Journal of the American Real Estate and Urban Economics Association* article (of which I was co-author) showed that the NCREIF and equity REIT returns series reflected at least some of the same fundamentals, once one took into account the nature of the appraisal process. Specifically, since most institutionally owned properties are appraised only once a year, with the bulk of appraisals occurring in the fourth quarter of the calendar year, a strong appraisal lag exists. Because changing market information is immediately incorporated into traded real estate company values, but is incorporated only during fourth-quarter institutional appraisals, publicly traded real estate company returns

were found to predict future appraisal-based returns.

Not only is that research now a decade old, but many important changes in the real estate industry have occurred that warrant a reexamination of those results. From 58 relatively small firms with \$5.6 billion in aggregate equity market capitalization in 1990, the industry has grown to 149 equity REITs with \$151.3 billion of equity market capitalization in 2002. REITs today hold a widely diversified set of properties of comparable quality to those in the NCREIF index. Further, we have now experienced another full real estate cycle, with the 1991-1992 downturn being especially severe for the commercial property sector. Finally, the 1990s were very interesting times for both the equity and bond markets in general. One of the striking aspects of the early studies of equity REIT returns was the very high correlation with stock market returns generally, and small stock returns in particular. The past decade provides new data to study this characteristic of real estate returns, and hence evaluate the risks of real estate firms relative to those of other sectors.

The lead-lag relationship between equity REITs and the NCREIF series is shown to continue over the longer time period, with lagged equity REIT returns predicting current period appraisal-based returns. Moreover, there is no evidence

that the relationship weakened during the 1990s. While one might have thought there would be a stronger contemporaneous correlation between the two real estate series as investors scrutinized widely available public and private market information, this clearly is not the case. The infrequency of appraisals continues to prevent the timely impounding of changes in supply and demand fundamentals into recorded NCREIF returns. And there is no reason to believe that the returns registered by publicly and privately held real estate firms will become more contemporaneously correlated, absent much more frequent appraisals.

In contrast, there has been a sharp decline in the strength of the positive correlation of publicly traded real estate returns with those on both the broader market and small stocks. This is consistent with a heightened awareness of the underlying risk profile of commercial real estate. The very steep drop in this correlation with small stocks reflects the different risks faced by owners of diversified property portfolios, whose returns are driven primarily by fairly stable net rental flows, and those of most small stocks, for which capital gains (or losses) that are the dominant return component. Stated differently, commercial real estate landlords are not trying to bring a new technology, product, or business process to market; hence, their business risks are quite different from

those borne by the typical small public firm that either succeeds (and becomes a big firm) or fails. While one would expect some positive contemporaneous correlation between real estate and broader market indexes because the demand for space ultimately is derived from that of firms, the lower correlations found over the past decade are reasonable.

REAL ESTATE, STOCKS, AND BONDS

The two primary real estate series used in this research are the NCREIF Property Index and the NAREIT Equity REIT Index. The former is a widely known, appraisal-based series of quarterly returns beginning in 1978, which reports returns for a widely diversified set of properties held by institutional investors. These properties are considered “core,” or institutional grade real estate. All property types and regions of the country are represented. This series represents unleveraged returns, as if the properties were purchased on an all-cash basis. Total return, together with its capital gain and income components, are reported.

The National Association of Real Estate Investment Trusts’ (NAREIT) Equity REIT Index represents the total returns on all equity REITs. Real estate public equity markets have expanded

enormously over time. In 1978, there were 33 firms in NAREIT’s equity REIT index, and they were all relatively small; the aggregate equity market capitalization of the group was \$576 million. The number of firms has since expanded five-fold, with the equity market capitalization just exceeding \$150 billion (which is now greater than the combined appraised value of the properties in the NCREIF Property Index).

The small capitalization figure prior to the 1990s led some observers to argue that publicly traded REITs were not representative of the commercial property universe; that this was why equity REIT returns were not contemporaneously correlated with private core real estate returns. However, this argument is refuted by the fact that even after the dramatic expansion of publicly traded equity REITs, the correlation remains unchanged. It is not property fundamentals, but rather the appraisal process that accounts for the lack of contemporaneous correlation across these commercial real estate return series, with infrequent and seasonal appraisals generating a lead-lag relationship between the series.

Table I reports means and standard deviations for excess quarterly returns (measured net of the returns to 90-day Treasury bills) on the two commercial real estate return series, various stock and bond indexes, and the Freddie Mac Repeat Sales

Table I: Summary Statistics

| Quarterly Excess Returns on Real Estate, Stocks, and Bonds (Standard deviation of returns in parentheses) | | | |
|---|-----------------|-----------------|-----------------|
| | 1978-1991 | 1992-2002 | 1978-2002 |
| Equity REITs-NAREIT | 1.79 (7.11) | 1.77 (6.58) | 1.78 (6.85) |
| NCREIF Property Index | 0.46 (1.61) | 0.89 (1.30) | 0.65 (1.49) |
| S&P 500 | 2.05 (8.21) | 1.56 (8.15) | 1.84 (8.15) |
| Small Stocks | 2.57 (12.02) | 2.01 (11.60) | 2.33 (11.79) |
| 20-yr Gov't Bonds | 0.71 (7.44) | 1.35 (4.69) | 0.99 (6.36) |
| Freddie Mac Repeat Sales Home Price Index | -0.6 (1.15) | 0.16 (0.67) | -0.27 (1.06) |
| Treasury Bills | 2.08 (0.63) | 1.06 (0.32) | 1.63 (0.73) |
| Inflation | 1.44 (1.02) | 0.63 (0.49) | 1.07 (0.91) |
| NAREIT, NCREIF, S&P500, Small Stock, Long-Term Government Bond, and Freddie Mac returns are net of the 90-day Treasury Bill return; the Treasury Bill and Inflation series are unadjusted | | | |

Home Price Appreciation Index. Returns on short-term Treasuries and the growth in the Consumer Price Index are also provided for comparison purposes. This table also reports summary statistics for two sub-periods: 1978-1991 and 1992-2002, the latter generally being considered the modern REIT era.

With respect to the nature of commercial real estate returns and variances, there are no significant changes over time. The first row of Table I documents that excess equity REIT returns average just over 1.75 percent on a quarterly basis in both time periods. Privately held real estate returns, as represented by the NCREIF Property Index, are higher in the latter period. The

difference in mean returns across these two series is explained largely by the greater REIT leverage. It also is the case that equity REITs experience somewhat greater capital gains over time.

The stock and bond returns are well documented. The high returns, and high volatility, of small stocks over this time period are evident, as is the great bond market rally of the mid- to late-1990s. One should not be misled by the negative mean return on the Freddie Mac Repeat Sales Home Price Index for 1978-1991 and 1978-2002, as only the appreciation component of owner-occupied housing is measured. The implicit rent is a substantial component of return for

housing, and its inclusion would generate a positive return for housing. The fact that the Freddie Mac appreciation component has exceeded the return on 90-day Treasuries since 1992 reflects the housing price boom that occurred in the latter half of the 1990s.

The most important feature of this table is reflected in the very different volatilities in returns of the traded stock and bond series relative to the appraisal-based NCREIF Property Index. The standard deviation on the NCREIF series is barely above 1, while those for the NAREIT Equity REIT Index, S&P500 Index, the small stock index, and the long-term government bond series are at least four times as great. This lesser return volatility is also demonstrated by the fact that the interquartile range in excess quarterly returns on the NCREIF Property Index runs only from -0.11 percent to 1.48 percent. For equity REITs the analogous figures are -2.37 percent and 6.13 percent. There is a very similar range for the S&P500, while that for the small stock index is much wider (its 25th percentile excess quarterly return is -4.30 percent; its 75th percentile excess quarterly return is 10.78 percent). Even long-term government bonds have a relatively wide interquartile range of returns compared to the appraisal commercial properties indexes (-2.72 percent to 5.15 percent).

While we find no contemporaneous correlation between the NAREIT and NCREIF series over any time period, there are some interesting changes in how commercial real estate returns correlate with the broader stock markets. For example, the 1978-1991 period finds excess equity REIT returns very strongly correlated with both the S&P500 and small stock index returns. There still is a statistically significant correlation during 1992-2002, but much less so. The correlation of equity REITs with the bond market also has weakened considerably over time, while the relationship with housing appreciation has become negative in the past decade. These changes have potentially interesting implications for how perceived real estate risk in the public markets evolves.

THE ROLE OF THE APPRAISAL PROCESS

Previous research has shown that the lack of a contemporaneous correlation between the transactions-based returns (equity REITs) and the appraisal-based returns on properties held by many institutional investors (NCREIF) is misleading because the appraisal process causes the privately held property series to lag changes in property values, at least through 1990. While appraisals could be done frequently, they generally occur only once a year. After all,

Table II: Excess Quarterly Returns By Quarter Equity REITs and NCREIF 1978-2002

| | NCREIF Property Index | | NAREIT Equity REIT Index | |
|-------------|--------------------------|----------|-----------------------------|----------|
| | Mean | Variance | Mean | Variance |
| 1st Quarter | 0.64 | 1.00 | 3.64 | 59.05 |
| 2nd Quarter | 0.51 | 1.29 | 2.34 | 20.95 |
| 3rd Quarter | 0.61 | 1.25 | 0.01 | 64.21 |
| 4th Quarter | 0.84 | 5.56 | 1.11 | 41.76 |

if you are an institutional investor and a long-term holder of commercial property, it is wasted expense to pay to continually value an asset you have no intention of selling. Consequently, even if appraisers are absolutely accurate in their valuations, changes in market fundamentals affecting property prices can be incorporated into the NCREIF return series only when an appraisal is completed.

The influence of the appraisal process is clear upon an examination of the NCREIF data. Since annual appraisals are the norm for institutional portfolios, there is heightened appraisal activity in the fourth quarter because many entities have reporting periods that match the calendar year. This introduces a very pronounced seasonal effect. Table II reports mean quarterly returns (in excess of the Treasury bill return, as above) and the variance about those returns by quarter. The return pattern on the NCREIF Property Index looks very similar for the first three quarters of any given year. Returns in excess of short-term Treasuries range from 0.51 percent to 0.64 percent, with the variance very close

to one. In the fourth quarter, the pattern changes, with the mean excess return rising to 0.84 percent, but more relevant is the roughly five-fold jump in variance about the mean to 5.56 percent.

With relatively few appraisals occurring in the first three quarters of the calendar year, the capital appreciation component of NCREIF total return cannot change very much from January to September. Thus, the reported total return for these quarters is derived almost exclusively from the net rental flow, which tends to be fairly stable on well-leased, core properties such as those typically owned by both REITs and institutional investors. Changes in market fundamentals affecting commercial real estate are thus largely impounded in the index via appraisals at the end of the calendar year. That this is the case is supported by the fact that it is the capital appreciation component, not the rental income component, whose volatility spikes in the fourth quarter. The variance in the appreciation component of total return on the NCREIF Property Index is

about six times higher in the fourth quarter than it is in any of the other three quarters. Moreover, there is never a significant difference in mean return or variance by quarter for the rental income component of total return on the NCREIF Property Index.

In sum, this series exhibits both strong persistence and a pronounced seasonality. The persistence occurs for two reasons—infrequent appraisals that artificially leave capital values unchanged across many quarters and the relatively stable net rental flows on well-leased buildings. The fourth quarter seasonal variance is almost totally due to the appraisal process.

Lagged values of any persistent series such as the NCREIF Property Index will predict the current value of the series. In this case, the first and fourth lags are very influential in predicting current period returns. Regressing the current period NCREIF Property Index return on its first and fourth lags explains 57 percent of the variation in the return, and leaves the “cleansed errors” largely purged of the strong positive autocorrelation evident in the raw data. The top panel of Table III reports our baseline regression comparing equity REIT returns to NCREIF returns. Given the correlation coefficients reported above, it is not surprising to find that current period returns on publicly traded REITs are not related to those on similar properties

held privately by institutional investors.

Splitting the sample into the pre- and post-modern REIT era yields very similar results. This suggests that the lack of contemporaneous correlation between the two real estate series found in previous research was not due to equity REITs owning properties dissimilar to those found in the NCREIF Property Index. While one might credibly argue about the lack of representativeness in the early period when the equity REIT market was much smaller, this is not the case in the latter period. Something else is at work, and that is the nature of the appraisal process itself.

To get at this issue, in 1992, Gyourko and Keim analyzed cumulative compounded equity REIT returns over the previous calendar year, finding that they possessed an ability to explain NCREIF returns. Because even 25 years of quarterly data is not an especially long time series for analytical purposes, one should be cautious about interpretations of the details of the lag structure. That said, our investigation never found the first quarterly lag of NAREIT’s equity REIT returns to have any statistically significant explanatory power with respect to the appraisal-based returns in NCREIF’s Property Index. The estimated coefficient always is positive, as one would anticipate from infrequent appraisals causing information to be reflected in the NCREIF data with a lag, but the first quarterly lag is never significant at even the 10

Table III: Transactions-Based and Appraisal-Based Real Estate Returns—Regression Analysis, 1979-2002*
(Standard deviations in parentheses)

| Panel 1: $NCREIF_t = \beta_0 + \beta_1 NAREIT_t + \beta_2 NCREIF_{t-1} + \beta_3 NCREIF_{t-4} + \varepsilon_t$ | | | | | | |
|--|---------------------|-----------------------------|--------------------------|----------------------------------|-------------|-------------------------|
| Intercept | NAREIT _t | | Adjusted-R2 | Durbin-Watson Statistic | | |
| 0.0419 (0.1163) | 0.0144 (0.0149) | | 0.56 | 1.83 | | |
| Panel 2: $NCREIF_t = \beta_0 + \beta_1 NAREIT_t + \beta_2 NAREIT_{year, t-1} + \beta_3 NCREIF_{t-1} + \beta_4 NCREIF_{t-4} + \varepsilon_t$ | | | | | | |
| Intercept | NAREIT _t | NAREIT _{year, t-1} | Adjusted-R2 | Durbin-Watson Statistic | | |
| -0.1767 (0.1219) | 0.0140 (0.0138) | 2.6206 (0.6716) | 0.62 | 1.96 | | |
| Panel 3: $NCREIF_t = \beta_0 + \beta_1 NAREIT_t + \beta_2 NAREIT_{year, t-1} + \beta_3 S\&P500_t + \beta_4 S\&P500_{year, t-1} + \beta_5 NCREIF_{t-1} + \beta_6 NCREIF_{t-4} + \varepsilon_t$ | | | | | | |
| Intercept | NAREIT _t | NAREIT _{year, t-1} | S&P500 _t | S&P500 _{year, t-1} | Adjusted-R2 | Durbin-Watson Statistic |
| -0.2038 (0.1275) | 0.0208 (0.0171) | 2.2541 (0.7535) | -0.0068 (0.0144) | 0.6814 (0.6402) | 0.61 | 1.97 |
| Panel 4: $NCREIF_t = \beta_0 + \beta_1 NAREIT_t + \beta_2 NAREIT_{year, t-1} + \beta_3 SmallStocks_t + \beta_4 SmallStocks_{year, t-1} + \beta_5 NCREIF_{t-1} + \beta_6 NCREIF_{t-4} + \varepsilon_t$ | | | | | | |
| Intercept | NAREIT _t | NAREIT _{year, t-1} | SmallStocks _t | SmallStocks _{year, t-1} | Adjusted-R2 | Durbin-Watson Statistic |
| -0.2051 (0.1239) | 0.0162 (0.0180) | 1.9635 (0.8091) | -0.0004 (0.0108) | 0.7649 (0.5298) | 0.62 | 1.96 |
| Panel 5: $NCREIF_t = \beta_0 + \beta_1 NAREIT_t + \beta_2 NAREIT_{year, t-1} + \beta_3 LongBonds_t + \beta_4 LongBonds_{year, t-1} + \beta_5 NCREIF_{t-1} + \beta_6 NCREIF_{t-4} + \varepsilon_t$ | | | | | | |
| Intercept | NAREIT _t | NAREIT _{year, t-1} | LongBonds _t | LongBonds _{year, t-1} | Adjusted-R2 | Durbin-Watson Statistic |
| -0.1670 (0.1261) | 0.0182 (0.0145) | 2.3787 (0.7198) | -0.0166 (0.0156) | 0.4362 (0.7928) | 0.61 | 1.93 |
| * 1978-2002: 96 Observations | | | | | | |

percent level. Looking at the first and second lags of quarterly equity REIT returns yielded similar results.

Estimating a model with four quarterly lags of the equity REIT variable yields significant predictive power for the lagged

variables, with the second and fourth lags being individually significant. In sum, including lagged equity REIT returns provides evidence in favor of a lead-lag relationship induced by infrequent appraisals.

We now turn to models using the

cumulatively compounded return variable used earlier by Gyourko and Keim, defined as the return over the four quarters constituting the calendar year immediately preceding the current quarter. This variable is useful in determining whether higher (lower) returns on equity REITs in the year preceding the current quarter can help explain whether today's returns on institutionally owned properties held in the private market also are higher (lower).

Panel 2 of Table III shows that the coefficient on the lagged equity REIT index is positive and statistically significant, with a one standard deviation change in the compounded quarterly equity REIT return over the previous calendar being associated with a 0.38 increase in the excess quarterly NCREIF Property Index return. This represents an economically meaningful impact, as the mean excess quarterly return on the NCREIF series is only 0.65 percent. This result is similar to what Gyourko and Keim found over a decade ago, with no evidence that the impact of lagged equity REIT returns has changed over time.

Given the relatively strong correlation of equity REIT returns with the returns on other stock series, the remaining panels of Table III report results from specifications that include various stock and bond series in addition to the equity REIT returns. Note that current or lagged returns on the S&P500, the small stock series, and the

long-term government bond index never have significant explanatory power (conditional on current and lagged equity REIT returns). More important, lagged equity REIT returns retain their statistical and economic significance after controlling for the influence of stock and bond series with which they are correlated.

Even if institutional investors were confident that public market real estate returns always accurately reflected changes in property market fundamentals, those changes simply cannot be immediately input into private real estate series such as the NCREIF Property Index as long as appraisals are performed relatively infrequently. Thus, not only do we know the return series is smoothed by the infrequent appraisals, but their returns continue to artificially lag changes in real estate fundamentals, a pattern that will persist unless appraisals become much more frequent. This has nothing to do with public versus private real estate performance, and everything to do with measurement errors.

COMMERCIAL REAL ESTATE RISK

The paper concludes with an analysis of what these data tell us about the nature of commercial real estate risk. The first question is whether the risk of commercial real estate, as measured by return volatility, can

be as low as the NCREIF data suggest. We then turn our attention to the much lower correlation that equity REITs have exhibited with respect to the stock market in recent years, asking whether this change is consistent with the true risk profile of commercial properties.

It has been demonstrated above that the very low volatility of real estate returns as measured by the NCREIF Index clearly reflects measurement error. While it is quite reasonable to believe that the net rental flows on a widely diversified portfolio of well-leased, institutional quality properties are very stable from quarter to quarter, the absence of appraisals each period obviously under-represents the volatility of the capital gain component of total return. The dramatic jump in the variance in total return on the appraisal-based series in the fourth quarter of the year (Table II) indicates the empirical importance of this factor.

Decomposing NCREIF's total return into its net rent (i.e., dividend equivalent for stocks) and appreciation (i.e., capital gains/losses for stocks) components, the point becomes even clearer. The mean of the net rental income component varies from only 1.93 percent to 1.95 percent across the four quarters of the year. The standard deviation about this return is 0.19 in each quarter, implying extremely low variation. Of course, if one diversifies with many properties and staggers lease

terms appropriately, net rents should be fairly stable over time. It is also noteworthy that this component of return is not subject to any appraisal bias. The net rents on the buildings in the NCREIF Property Index should be (and are) measured accurately.

In contrast, the mean return on the capital appreciation component of the total NCREIF Property Index return in the fourth quarter is almost double that of the next higher quarter (0.52 percent in the fourth quarter versus 0.30 percent and 0.28 percent in the third and first quarters, respectively). The standard deviation in the fourth quarter is 2.69, versus 1.1 to 1.2 in the other three quarters. This implies a variance about the mean that is about six times higher in the fourth quarter.

With volatility in capital values effectively capable of being registered only in the fourth quarter, and statistical analyses of this series weighting each observation equally, the volatility of the NCREIF series is quite low compared to traded assets. This leads to artificially favorable portfolio implications, as the covariance of this real estate series with stocks and bonds is artificially low due to the smoothing introduced by the appraisal process. In a standard asset allocation model, adding appraisal-based real estate to a diversified stock and bond portfolio generally results in a 35 percent—or greater—optimal share for real estate. Given that commer-

cial real estate's share of the investible universe is estimated at about 10 percent, one does not have to be a committed believer in efficient markets to conclude that a 35 percent allocation to real estate is too high.

Of course, the fact that one does not believe the asset allocation implications of appraisal-based real estate series does not mean that the true risk and return profile of real estate is necessarily given by equity REITs. Stock markets are subject to fads, and we have seen fairly dramatic changes in how equity REIT returns correlate with stocks. Prior to the modern REIT era (1978-1991), one could use the broader market—and small stocks in particular—to account for how equity REITs performed.

Should real estate returns mimic the stock market's returns and small stock returns? The answer is "not really," because the business risks facing commercial landlords are different from those facing the stock market. For example, assume an office REIT with a large number of properties across many major markets, and assume that the S&P500 firms represent the stock market, and that they rent space in the REIT's office portfolio *pro rata* to their share in the stock index. Given these assumptions, the beta of the tenant base is one. The question is whether the beta of the office REIT is greater than, equal to, or less than one. On the upside of the busi-

ness cycle, tenant cash flows are rising, while to a first approximation, the REIT's cash flows as their landlord are not changing. The REIT has multi-year lease contracts at fixed terms, and does not share in the operating risk or rewards of the tenants. The REIT's cash flow is rising only to the extent that some of the tenants' leases expire during upcycle and rents are raised. In addition, the vacancy rate falls, but most of the tenants still pay the same rent. On the downside of the cycle, the same dynamics work in reverse.

The circumstances in which the landlord's cash flow does not go up as much as the stock market cash flow on the upside, and does not go down as much on the downside, characterizes a low beta. The same analysis applies to other property types, including multifamily residential, industrial facilities, and warehouses. Mall and shopping-center owners sometimes use leases in which they effectively participate in the operating risk of their store-owner tenants, so their betas will be somewhat higher. Recent research in real estate finance confirms this conclusion: the betas of most publicly traded real estate firms are well below one.

This conclusion that a diversified real estate portfolio is relatively less risky holds especially true with respect to small stocks. Even though equity REIT returns have been extremely strongly positively correlat-

ed with small stock returns in the distant past, they are very different series. Publicly traded landlords tend to own large portfolios of a single property type (office, shopping center, apartments) in different markets, with their total returns driven largely by the size of their dividend flows. The dividend component of quarterly mean returns since 1978 constitutes more than 60 percent of the total return on equity REITs, materially stabilizing returns.

The situation is very different for the firms in the S&P500, and for small stocks in particular. While dividend yields on the broader market fell below 2 percent in the 1990s, they have not approached the level seen on equity REITs in past decades. In *Stocks for the Long Run*, Jeremy Siegel reports betas for stocks in the two smallest deciles of the NYSE/AMEX/NASDAQ exchanges to be over 1.3, with the compound annual return on small stocks being more than 600 basis points above that for stocks in the largest size decile. When one thinks about small stocks, one envisions a firm trying to bring some new technology, product, or business application to the market. Small stocks tend to become big stocks if they are successful; otherwise they fail. In any event, almost all the return comes in the form of capital gain. This is not the case for landlords. They own assets whose basic functionality is a given, and which are little affected by technological

change—at least, compared to many other business sectors. Property-level cash flows are procyclical to some extent, but we have identified various reasons why they should not co-vary strongly with the cash flows of the firms occupying space in the buildings.

In sum, the relatively low volatility of commercial real estate returns seems to be justified by property market fundamentals. However, this aspect of return is substantially mismeasured, and appears to be much too smooth due to the appraisal process in the NCREIF data. Since the fundamental risk of commercial real estate is different from that of the overall market, and markedly different from that associated with small firms, the lower correlations of equity REIT returns with those on the S&P500 and small stocks in the 1990s are consistent with investors coming to a better understanding of the different types of risks faced by these firms.

CONCLUSIONS

The lead-lag relationship whereby past returns on publicly traded real estate companies helped explain current period returns on privately held properties valued by appraisal continued to hold in the 1990s. Market fundamentals affecting properties were first reflected in the prices of equity REITs, and were only slowly reflected in private portfolios when

appraisals were performed. While the thriving nature and high visibility of both the public and private markets in real estate should lead to the series being positively correlated on a contemporaneous basis, the nature of the appraisal process prevents this convergence. As long as shocks to market fundamentals fail to be quickly reflected in appraisals, and as long as appraisals continue to be performed infrequently, the public markets in real estate will continue to “lead” the private markets.

While there are good reasons to believe that the public markets need not perfectly reflect the true risk profile of commercial real estate, appraisal-based series such as the NCREIF Property Index massively understate the return volatility of commercial properties, particularly for asset allocation purposes. In addition, the lower correlation in recent years of equity REIT returns with those on the broader market and with small stocks is consistent with the nature of the underlying risk-return profile of commercial real estate. Both conceptual and empirical results suggest low betas for most property types, indicating that one should not expect real estate returns to follow the market precisely over a given cycle.

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