

Volume 21

Number Two

# REAL ESTATE ISSUES

“CAP RATES\$/YIELDS\$:  
MARKET TRENDS  
AND RELATIONSHIPS”



The Counselors of Real Estate™ (CRE)  
(American Society of Real Estate Counselors)

in conjunction with



The National Council of Real Estate  
Investment Fiduciaries (NCREIF)

## FOCUS EDITION

- *Recent Evidence on Investor Preferences and Yield Requirements*  
Hugh F. Kelly, CRE
- *REITs and the Private Market: Are Comparisons Meaningful?*  
Richard Marchitelli, CRE, and  
James R. MacCrate, CRE
- *Capitalization Rates, Discount Rates and Reasonableness*  
D. Richard Wincott, CRE, Kevin A. Hoover  
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- *Factory Outlet Centers: Public vs. Private Pricing*  
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- *A Simplified Approach to Understanding Capitalization Rates*  
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## EXPERTS' AND CONSULTANTS' GUIDE

# CONTRIBUTOR INFORMATION FOR REAL ESTATE ISSUES

The journal is published three times annually (April, August and December), and reaches a lucrative segment of the real estate industry as well as a representative cross section of professionals in related industries.

Subscribers to *Real Estate Issues* are primarily the owners, chairmen, presidents and vice presidents of real estate companies, financial corporations, property companies, banks, management companies, libraries and Realtor® boards throughout the country; professors and university personnel; and professionals in S&Ls, insurance companies and law firms.

*Real Estate Issues* is published for the benefit of the CRE (Counselor of Real Estate) and other real estate professionals, planners, architects, developers, economists, government personnel, lawyers and accountants. It focuses on providing up-to-date information on problems and topics in the field of real estate.

## Review Process

All manuscripts are reviewed by three members of the editorial board with the author's name(s) kept anonymous. When accepted, the manuscript and any recommended changes is returned to the author for revision. If the manuscript is not accepted, the author is notified by letter.

The policy of *Real Estate Issues* is not to accept articles that directly and blatantly advertise, publicize or promote the author or the author's firm or products. This policy is not intended to exclude any mention of the author, his/her firm or their activities. Any such presentations however, should be as general as possible, modest in tone, and interesting to a wide variety of readers. Potential conflicts of interest between the publication of an article and its advertising value should also be avoided.

Every effort will be made to notify the author on the acceptance or rejection of the manuscript at the earliest possible date. Upon publication, copyright is held by The Counselors of Real Estate (American Society of Real Estate Counselors). The publisher will not refuse any reasonable request by the author for permission to reproduce any of his contributions to the journal.

## Deadlines

All manuscripts to be considered for the April edition must be submitted by January 15; for the August edition by June 1; for the December edition by September 1.

## Manuscript/Illustrations Preparation

1. Manuscripts **must be submitted on disk** (along with hard copy): ASCII file format or Word for Windows 6.0. All submitted materials, including abstract, text and notes, are to be **double-spaced** on one side only per sheet, with wide margins. Recommended number of manuscript pages is not to exceed 15. **Submit five copies of the manuscript accompanied by a 50- to 100-word abstract and a brief biographical statement.**

2. All notes, both citations and explanatory, are to be numbered consecutively in the text and placed at the end of the manuscript.

3. Illustrations are to be considered as figures, numbered consecutively and submitted in a form suitable for reproduction. (Camera-ready form, line screen not to exceed 80 dots per inch-DPI.) If higher DPI is warranted to show greater image blends or contrast, illustrations must be computer-generated on a Macintosh or PC compatible using the following formats: QuarkXPress, PageMaker, Illustrator, Photoshop, Corel Draw. Any other formats will not be accepted.

4. Number all tables consecutively. All tables are to have titles.

5. Whenever possible, include glossy photographs to clarify and enhance the content in your article.

6. Title of article should contain no more than six words including an active verb.

7. For uniformity and accuracy consistent with our editorial policy, refer to the style rules in *The Chicago Manual of Style*.

## REAL ESTATE ISSUES 1996 Editorial Calendar

**April** (Deadline for manuscript submission—January 15)  
**Articles on general real estate-related topics**

**August** (Deadline for manuscript submission—June 1)  
**Focus Edition "Cap Rates/Yields: Market Trends and Relationships"**

**December** (Deadline for manuscript submission—September 1)

**Special Edition "The Dynamics of Sports and Community Development"**

Readers are encouraged to submit their manuscripts to:

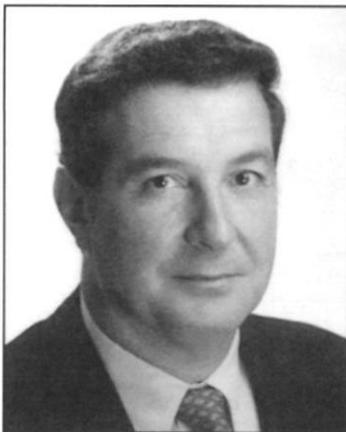
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## THE BALLARD AWARD MANUSCRIPT SUBMISSION INFORMATION

The editorial board of *Real Estate Issues (REI)* is accepting manuscripts in competition for the 1996 William S. Ballard Award. The competition is open to members of The Counselors of Real Estate and other real estate professionals. The \$500 cash award and plaque is presented in November during The Counselor's annual convention to the author(s) whose manuscript best exemplifies the high standards of content maintained in the journal. The recipient is selected by a three person subcommittee comprised of members of The Counselors of Real Estate. Any articles published in *REI* during the 1996 calendar year are eligible for consideration and must be submitted by September 1, 1996.

THE  
PRESIDENT  
SPEAKS

PROFESSIONALS  
ADDRESS CAP  
RATES AND  
MARKET  
IMPACT



Logan H. Babin, Jr., CRE

The Counselors and *Real Estate Issues* strive to provide the very latest information on topics that shape and oftentimes change the course of real estate-related activities. Such is the case with the August Focus Edition of the journal on “Cap Rates/Yields: Market Trends and Relationships”. Presented in conjunction with the National Council of Real Estate Investment Fiduciaries (NCREIF), the Focus Edition provides readers an inside look and understanding of current trends in cap rates and their effect on various real estate investments.

The subject of capitalization rates was last visited by *Real Estate Issues* in a 1992 Special Edition. Then, as now, cap rates are the magic numbers which enable Counselors, appraisers and other real estate professionals to convert income into value. Since the process involves division and numbers to the right of the decimal point, small differences in cap rates can translate into large differences in value.

The Counselors of Real Estate welcomes this opportunity to showcase the work of those professionals responsible for the thought provoking articles in this issue. It is our hope that you, our readers, will benefit from this timely and comprehensive analysis of capital rates and yields, broadening your personal understanding of their impact on the commercial real estate market.

A handwritten signature in black ink that reads "Logan H. Babin, Jr." The signature is fluid and cursive, with a large initial 'L' and 'B'.

Logan H. Babin, Jr., CRE

1996 President

*The Counselors of Real Estate*

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Hugh F. Kelly, CRE

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Richard Marchitelli, CRE, and  
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Richard B. Gold

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# CAP RATES AND TRACKING MARKET TRENDS

The topic of capitalization rates, yields and market trends is both simple and complex to understand. We know, for example, that in concept a capitalization rate is income divided by the price paid. More specifically, an *overall* cap rate is a property's net operating income divided by the price paid for the property—in symbols  $R_o = NOI / P$ . Similarly, the cap rate for equity is the income to equity (before-tax cash flow) divided by the price paid for the equity interest ( $R_e = BTCF / P_e$ ), and the cap rate for a mortgage is the annual debt service divided by the amount of the loan ( $R_m = ADS / V_m$ ). While there are a number of methods for estimating an  $R_o$ , such as direct market extraction, simple mortgage-equity, the Akerson format, the Ellwood formulation and the underwriters' method (Gettel), they are all designed to estimate the reciprocal of the net income multiplier—the multiple of net income that buyers are likely to pay for a property.

Furthermore, we know that a capitalization rate has two major components, a rate for the desired rate of return on the investment and a provision to provide for expected capital loss or enhancement. The well-known tendency for cap rates to remain relatively stable through the economic cycle is probably a result of the different operation of the economy on these two components. What is not known, however, is the nature of these operations and the true extent to which they offset each other.

While a forecast yield is a component of a cap rate, the yield obtained from a property is very different from the cap rate, first, because the yield is only one component of the cap rate, and, second, because the yield can, in reality, be known only after disposition of the property. Investors usually have desires or expectations about a property's yield; thus, the price paid is the amount that will result in the expected yield provided that all other forecasts regarding the property's performance are realized. For this reason, most financial economists assume that yields *drive* cap rates and, therefore, are only of secondary importance in financial analysis. While in an overall investment sense this may be true, it is also true that cap rates are important tools for property analysts to estimate market values and track market trends.

The importance of cap rates and yields to real estate analysis is fundamental; yet the relationships remain obscure between them as well as with interest rates and other economic phenomena. Although this edition of *Real Estate Issues* will not reveal the nature of all these relationships, it does add crucial information about them. Some of the issues addressed include the pricing of risk, why cap rates tend to cluster around 9 percent, a different way to conceptualize cap rates, relationships among various return measures, the variance of cap rates across metropolitan markets and whether comparisons between REITs and the private market are meaningful. Through the entire market cycle, this edition of the journal should serve as an ongoing reference for Counselors and other real estate analysts.



Halbert C. Smith, CRE

A handwritten signature in cursive script that reads "Hal Smith".

Halbert C. Smith, CRE  
Editor in chief

# RECENT EVIDENCE ON INVESTOR PREFERENCES AND YIELD REQUIREMENTS\*

by Hugh F. Kelly, CRE

*\*The principal compendium of information upon which this article relies is a database of sales compiled for the CCIM/Landauer Investment Trends Quarterly, a joint venture between the Commercial Investment Real Estate Institute and Landauer Associates. Sales resident in the database, with a closing date of January 1, 1995 or later, are the subject of the analysis and commentary in the article. Such sales number more than 1,600 nationwide and have an aggregate investment value of more than \$13 billion. While it is conceded that the database simply represents a sample of U.S. commercial property activity, it does provide a powerful approximation of activity on the national scale.*

Following the industry depression during the early years of this decade, there are voices that claim to discern revolutionary change in the structure of the real estate industry. The purported causes of the revolution range from the job market effects of the aging Baby Boomers to yet another death watch for Central Business Districts, from the impending obsolescence of whole ownership of real estate in the face of equity and debt securitization to claims that technological advances are doing nothing less than making real estate use optional for businesses. Perhaps apocalyptic fears are expected with the approach of a new millenium. Certainly all the Nostradamuses in our industry can point to clues, if not proof, to support their visionary projections. However, this article is not the place to refute or vindicate any such rationalizations. Instead I will look at the body of evidence to see how the behavior of the investment community, in its preferences and return requirements, displays its implicit expectations for the future.

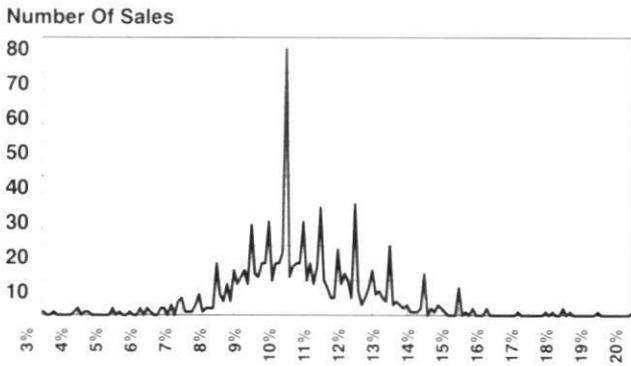
## Summary Of Property Markets

The follow statistics recapitulate the activity reported in the *CCIM/Landauer Investment Trends Quarterly* for January 1995-March 1996. *Office properties* led the property types in the number of sales and aggregate value of transactions, with 480 deals totaling \$6.2 billion. This represented 70 million square feet of office space, approximately equal to the combined office inventory of Miami, Orlando and Tampa. *Retail properties* were somewhat less favored over the 15 month period, with 276 sales registering an aggregate price of \$2.1 billion. Store area of 28 million square feet was included in the transaction sample, which equates to a typical retail inventory for a metropolitan area of about 1.6 million in Sacramento or Denver. The *industrial sector* accounted for 217 sales and a dollar volume of \$821 million for 24 million square feet, the equivalent of a market like Columbia, South Carolina or Bridgeport, Connecticut. Multifamily residential assets tallied 196 deals worth \$1.2 billion for 34,202 apartment units, about right for a town the size of Reno, Nevada. *Hotels* also were actively traded despite protestations of investors that they would never again buy any property with a bed in it. Hospitality sales of 103, comprised of 22,502 rooms, brought a total sales price of \$1.9 billion. The balance of the sales in the database consisted of *land* (220 deals, 7,513 acres, \$400 million), *portfolio transactions*, *mixed-use* and *speciality properties*.

*Hugh F. Kelly, CRE, national director/research, Landauer Associates, Inc., New York, prepares and presents national and regional economic forecasts on property markets. Kelly also writes and teaches about economic issues and their implications for real estate investment.*

## EXHIBIT I

Range of Initial Yields in the  
CCIM/Landauer Database



Analysis based on actual yields reported through June 1996

This capsule summary illustrates that the liquidity crisis of the early 1990s was indeed a temporary phenomenon, rather than a precursor of permanent structural change in the commercial property investment arena. While we lack a commensurable set of data for prior periods (and must recognize that this database itself is just establishing its own benchmarks), both the pace of recent activity (3.0 sales per day reported into the database for 1995, and 4.7 sales per day submitted for the first quarter of 1996) and its breadth currently indicate that a liquid transaction market exists for all major property groups.

Does this mean that real estate has returned to normal? In an arena so vast and complex as the U.S. property markets, it is safest not to respond by generalizing. But, as any good detective would advise, the best answer is to follow the money. The distribution of activity among the property types offers one perspective, and the capitalization rates indicated by the transactions provide another.

### Capitalization Rates

Cap rates were reported for approximately 800 of the sales in the sample, and the number of transactions observed at each cap rate are graphed in Exhibit I. The extremely wide spread of initial returns is readily seen, with a very thin layer of sales at cap rates of less than 8 percent and greater than 13 percent. A prominent peak occurs at 10 percent, which, in fact, was the reported capitalization rate for about one sale in every ten. This is only the most dramatic spike in the entire graph, but closer inspection shows repetitive crests at each integer value cap rate (i.e., 8.0 percent, 9.0 percent, 11.0 percent, 12.0 percent), with another set of peaks at the half-percent cap rates (8.5 percent, 9.5 percent, etc.). It is not clear whether this pattern in rates resulted from a rounding bias in the reporting of

yields or whether investors negotiate to prices which are convenient to understand at 50 basis point intervals on the cap rate scale. If the latter, this would be a sign that properties are still being priced on their ability to offer current return, versus futures as measured by prospective improvement in cash flow and appreciation, discounted to a net present value.

Sophisticated mixed-asset investors (i.e., investors holding portfolios of bonds, stocks and real estate) are likely to cast a wary eye at the spikes displayed in Exhibit I, based upon recent irregularities in the penny-stock market. There regulators have found evidence of price manipulation in the clustering of prices at what are called even bits. A bit is one-eighth of a dollar (a unit of price which survives only in the financial markets and in the archaic phrase "shave and a haircut: two bits"). Theoretically, in an efficient market, there ought to be a smooth continuity of bid-and-asked pricing. Consequently, market monitors suspected dealers of rounding up prices to the next quarter-dollar per share in order to inflate commissions.

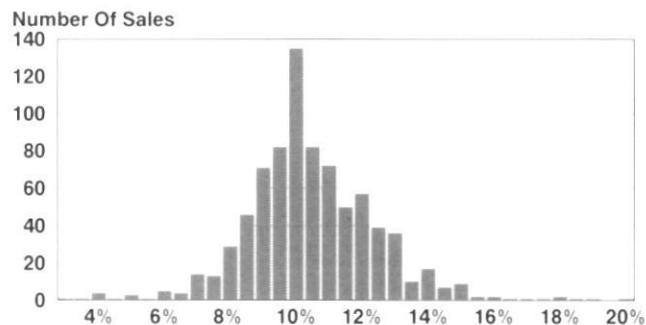
### Lumpiness Of Data

The nature of the cap rate data, which is drawn from hundreds of totally independent sales—without common links as to individual buyers, sellers or brokers—eliminates the possibility of manipulation in the pricing information. However, it does point to another area of concern for professional investors: the lumpiness of real estate as an asset class. On one level, that lumpiness is the sheer volume of price needed to acquire individual real estate assets, typically in the millions of dollars per property, as opposed to much smaller per unit prices of stock shares and bonds. This is one reason cited for the growing popularity of securitized real estate investment. Certainly, there are other instances of rounding in the real estate transaction data. The higher the price the more likely the transaction amount will be rounded to the nearest hundreds-of-thousands or millions of dollars, a phenomenon unusual in the bond and stock markets where margins are finely separated and fluctuate minute to minute. Does the preponderance of integral and half-point cap rates suggest some market inefficiency and consequently, some money left on the table in real estate investments? The answer is likely to be "yes."

But part of the apparent lumpiness of the data is simply a question of scale. Even the smoothest block of polished marble when placed under a microscope will appear as a jagged composite of hills and valleys. Most investors when asked to articulate their rate-of-return requirements, will express these in terms of integral or half-point percentages. It may, therefore, be most appropriate to examine the data at that scale.

## EXHIBIT II

### Range of Initial Yields in the CCIM/Landauer Database



Analysis based on yields rounded to the nearest .5%;  
through June 1996

#### *The Meaning Behind The Curves*

When the individual sales data are conflated into a histogram of cap rates, clustered on the nearest half-percent, the statistical information assumes the familiar shape of the bell curve representing the normal distribution. (See Exhibit II). The distribution of returns is not perfectly symmetrical. There is a slight but definite skewing of the curve with cap rates in the 12 percent-13 percent range appearing more frequently than the complementary cluster of rates at 7 percent-8 percent. There may be a variety of reasons for this asymmetry: property age and size, the weighting of property types across the range of cap rates, the buyers and sellers operating at various levels of return and the possible influence of geography.

Having noted the skewedness, some fundamental points deserve to be underscored. First of all, failure to fit the normal distribution perfectly doesn't mean that the data sample is somehow upward biased. Indeed, it would be very rare to find a natural set of data (that is, measurements of sampled observations of behavior) which exactly fit the statistical ideal. The distribution curve is a close enough approximation of the standard that a high level of confidence can be inferred from the data.

Secondly, the shape of the curve is consistent with a single, coherent data set. We do not see a bimodal distribution, one with twin peaks to suggest there are distinctive subsets of behavior. The classic example from statistics texts is a chart measuring the time to complete a puzzle that has two separate solutions. From time to time in real estate discussion, we hear about two-tier markets or similar concepts which imply there is a sharp distinction or discontinuity between the behavior of different investor classes, such as institutional versus small

investors, domestic versus foreign purchasers or whole asset versus securitized owners. The CCIM/Landauer data set does not support such a claim for initial return requirements for 1995 and early 1996, although some evidence can be adduced that shows important preference shadings along the yield spectrum.

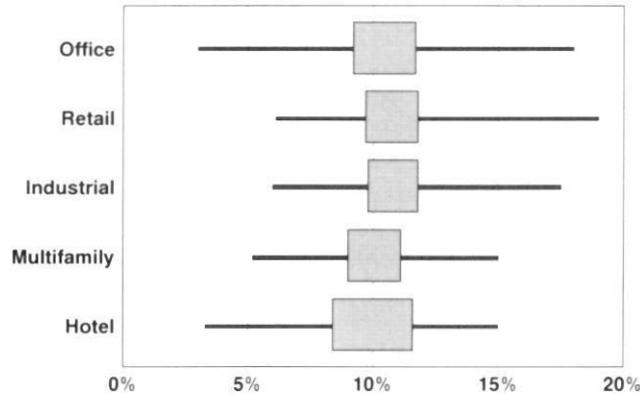
Third, the curve allows us to look at the entire range of data, to listen to the full span of market information. Most analyses tend to look at central tendencies: averages, medians, transactions that are typical of marketplace behavior. Outlier information tends to be regarded as a problem that needs to be explained away. I recall two comments, made by astute senior property professionals, that ought to be engraved on plaques awarded at the conclusion of every course in real estate statistics. The first I heard from a Counselor after a demonstration of a computer-assisted mass appraisal program. He said, "But, if I'm selling my house, I don't really want to know what 80 of the last 100 houses sold for. I want to know what the house across the street that sold last week got." And, from the manager of one of the largest pension fund property portfolios in the nation came this observation: "Appraisals are a very important part of the investment process, and the valuation discipline really can't be ignored in managing our assets. But, in all honesty, my whole job can be defined as disagreeing with appraisals. If I only bought or sold properties at their appraised value, I wouldn't be bringing anything in the way of improved performance to my investors. And that's what they pay me for."

What happens on the tails of the normal curve is as much a part of the investment universe as the bulge in the middle. To the degree that the herd instinct is a recurrent danger of the commercial property investment world, the behaviors of buyers and sellers at the upper and lower reaches of the cap rate range help us identify where investors identify special risks and opportunities. We look at the entire range of the distribution to avoid the blindness to information that comes from imposing a priori limits to what data is relevant. Our job is to make sense of the data and not only look at data that make sense.

Having said that, one of the most compelling stories to emerge from the array of capitalization rates is the concentration of yields near the center of the range. In Exhibit III the graphic display technique of the box and whisker-type graph illustrates the extent of the range of cap rates for each of the five major commercial property investment categories, i.e., offices, retail, industrials, multifamily and hotel (land is not typically sold on the basis of income capitalization). Box and whisker graphs, perhaps unfamiliar to some real estate professionals, are rather easy to understand. The lines or whiskers of the graph extend from the highest to the

### EXHIBIT III

#### National Capitalization Rates



Source: Landauer Associates, Inc.; Investment Trends Quarterly, 1/1/95 through 5/31/96

lowest observations. The box in the center represents the middle 50 percent of the observations, that is, the data between the 25th and 75th percentile of all observations.

Two things are striking in the Exhibit III data. First, across all property types, there is a remarkably tight clustering of cap rates within the boxes. Second, there is substantial overlap in the boxes when property types are compared to each other. Clearly the market evidence suggests that we are in a period of rather keen competition for investment. For all property types, the 25th percentile of capitalization rates is marked at 9.3 percent and the 75th percentile is 11.6 percent. A span of only 230 basis points encompasses both conservatively and aggressively priced deals, at least as such characterizations apply comparatively to the entire range of transactions. All commercial property types find their mid-range of cap rates, as displayed by the boxes, substantially congruent. Investors do display a variety of property-type preferences, and there is a measurable distinction among the property types when average and median cap rates are calculated. But, taken on the whole, there is a similarity in the initial rates of return reflected in the sales data across property types. In 1995 and early 1996, the market achieved substantial consensus on the level of going-in returns needed to generate bidding on investment real estate. This apparent consensus suggests the growing influence of national players on price levels, either directly on the part of REITs and institutional equity investors, or indirectly through the underwriting requirements of whole asset lenders or through investors eying a CMBS strategy. Without a consistent historical series of comparable cap rate data, it is difficult to determine definitively the extent of the role of the big players

in establishing pricing parameters. The tight ranges of cap rates displayed by the majority of sales, however, does call into question the supposed information inefficiency of the property markets.

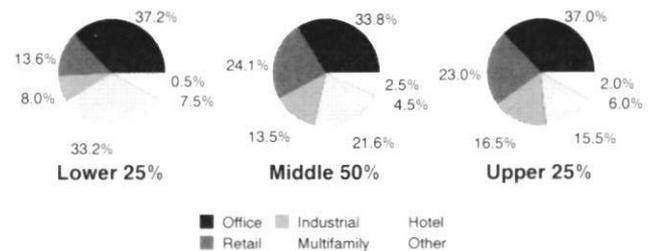
There is, on the contrary, an ostensible agreement on the current viability of commercial property and its future performance that is undergirding return requirements. As we shall see, this is true not only across property types but among investor groups and around the nation as well. As in the lumpiness of the cap rate curve in Exhibit I, the question of scale must be considered. Although there is undoubtedly a long way to go in providing standardized and timely information on the real estate investment market, the box and whisker chart in Exhibit III and the yield curve in Exhibit II look anything but random. Instead, they describe a rational market of buyers and sellers with a significant awareness of pricing expectations in an asset class where the individual items traded are decidedly not uniform.

#### Cap Rates And Property Types

How do the cluster of sales in the lowest (under 9.3 percent) and highest (above 11.6 percent) cap rate quartiles differ from the mid-range sales? We can look at the data in several ways: by distribution of property types, geography and buyer/seller activity. As shown in the pie charts of Exhibit IV, office properties were the most actively traded real estate in 1995 and early 1996, capturing 34 percent to 37 percent of the total number of sales at all levels of cap rate, ranking first at the low, mid-range and high levels of initial return. There is a manifest appetite for office investments across the spectrum of risk and return. Investors are loudly voting no to the proposition that telecommuting, alternative office utilization schemes and advances in technology will render the office building obsolete over any meaningful investment horizon.

### EXHIBIT IV

#### Distribution of Transactions by Property Type



Source: Landauer Associates Inc.; Investment Trends Quarterly, 1/1/95 through 5/31/96

Likewise, investors believe there is a favorable future for *multifamily properties* and have bid up prices accordingly. Apartments represent a third of the sales in the lowest quartile of cap rates, but only 15.7 percent of sales in the cap rate range above 11.6 percent. If the principle of anticipation is sound, that current value is the present worth of expected future benefits, investors are saying they are willing to accept somewhat lower initial returns for multifamily properties because of the potential for higher rents and capital appreciation in the coming years.

*Industrials and retail*, on the other hand, must provide high levels of current yield to attract buyers. The share of the pie captured by industrial transactions grows steadily as the cap rate rises, a characteristic which may be attributable to the flatness of income streams based upon long-term net leases, but which also may point to some investor nervousness about vulnerability to supply/demand equilibrium changes over the holding period. Shopping center yields vary significantly according to the size of the property, with regional malls still commanding the best price-to-income multiples. But retail properties garnered only 13.6 percent of the total number of sales with cap rates in the lower quartile, as opposed to 23 percent-24 percent in the midrange and upper quartile. Proven performers, therefore, have the advantage among shopping centers as investors are most comfortable with assets throwing off significant net operating income at the time of sale. *Hotels, mixed-use developments, recreational properties, and portfolio sales* account for approximately 7 percent-8 percent of activity across the entire range of cap rates.

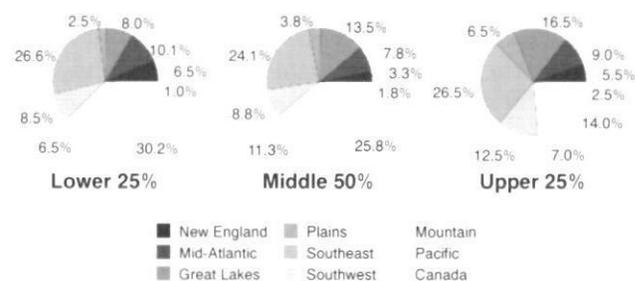
### Regional Differences

When we examine the transaction activity regionally, it is evident that investors are pricing the economic growth prospects of the Southeast and Pacific states favorably, while demanding higher levels of current return to acquire assets in the Southwest and Midwest (see Exhibit V). The West Coast, driven by signs of revival in the California economy, posted 30 percent of the sales in the lower quartile of cap rates, about a quarter of all sales in the midrange, and only 14 percent of the transactions at the high-end of going-in rates. The Southeast, the most active of all regions in the aggregate amount of commercial property sales activity in 1995 and early 1996, was remarkably consistent in its share of volume at all levels of cap rate, ranging from 24.1 percent of the midrange sales, to 26.5 percent of the high cap rate deals and a nearly identical 26.6 percent of deals in the lower quartile.

A less favorable assessment of risk and appreciation potential is influencing prices in other regions of the country. The Great Lakes area, for

## EXHIBIT V

### Distribution of Transactions by Region



Source: Landauer Associates, Inc.; Investment Trends Quarterly, 1/1/95 through 5/31/96

example, captures only 8 percent of all deals represented in the lower quartile of cap rates, but its share more than doubles to 16.5 percent in the upper cap rate range. Likewise, in the Plains states, the shift in share is from 2.5 percent at the low end of the range of initial returns to 6.5 percent on the high side. The Southwest (Texas, Oklahoma, Arkansas and Louisiana) has approximately the same share in the lower quartile (8.5 percent) as in the midrange (8.8 percent), but its slice of the pie jumps to 12.5 percent of deal with cap rates of 11.6 percent or above.

The importance of location, then, is still a potent influence on investor preferences, as it should be. The links of property investment performance to the underlying economic base are quite strong. Commercial real estate exists to house economic activity, and the greater that activity the more likely that rents and values will be bid upward. This is one theme where a back-to-basics movement is never out of date.

### Investors, Investors, Investors

Finally, some indications of investor behaviors can be noted, although the data is so complex and rich it could warrant its own article. First, the continued importance of the small private investor in commercial property is clearly discernable in the transaction activity. Both in the number of transactions (cited in this article) and in terms of aggregate dollar amounts, individual investors constitute a strong force in the marketplace, notwithstanding the huge amount of attention given to REITs and institutional investors. *Individual private investors* accounted for 35.7 percent of all sales in the lower quartile of cap rates and more than half of the sales in the upper quartile. Besides the propensity of these investors to seek current income from their property acquisition, they describe an active appetite at all levels of yield, and consequently an

influence on pricing which must affect even the larger players.

*Insurance companies* are enormous net sellers of property at the present time. Their buy/sell distribution across the cap rate spectrum is telling. As buyers, they have a 6 percent share of all sales in the lower quartile of cap rates and are virtually absent at the midrange and upper quartiles of initial return. As sellers, though, the life companies are in the midst of huge divestiture programs and accounted for 12.2 percent of sales at the lower quartile of cap rates, 11.3 percent in the midrange and a stunning 18.1 percent at cap rates in the upper quartile. Clearly, there is a sharp discounting of price coming from this sector in order to lighten real estate portfolios.

*Limited partnerships and joint ventures*, by contrast, represent 13.5 percent of acquisitions in the upper cap rate quartile, but only 8 percent of the deals at the lower end of returns. As sellers, though, they have 14.2 percent of the lower quartile deals and 9 percent of the high cap rate sales. These appear as fairly astute market timers and are

perhaps representative of the traders' mentality that emerges in more liquid real estate markets.

*Developers*, meanwhile, have been able to take advantage of the greater liquidity to sell assets built toward the end of the 1980's construction cycle, assets which were held as inventory (usually involuntarily) in the market trough. Both as buyers and as sellers, developers follow the bell curve in their distribution along the cap rate spectrum.

#### **An Industry In Flux**

The real estate industry is, as always, in a period of evolution. The Darwinian imperative to adapt to a changing environment speaks to the very nature of our market discipline. The information on current investor return requirements and property preferences suggests that the current era affords a rather coherent environment in which to make real estate investment decisions. Rather than being a frightening time of revolutionary discontinuous shifts, the late 1990s appear as a time in which rational, almost traditional investment parameters are governing the behavior of the market.

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NOT ALWAYS BE SOMETHING  
YOU WISH TO HEAR.**

**HOWEVER, OUR  
ANSWERS ARE ALWAYS SOMETHING  
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# REITS AND THE PRIVATE MARKET: ARE COMPARISONS MEANINGFUL?

by Richard Marchitelli, CRE, and James R. MacCrate, CRE

**R**EIT shares are securities. They are paper entitlements representing a financial interest or claim to a return. An individual real estate asset can be an office building, shopping center or similar type of property that is privately owned.

REITs were formed in the 1960s as vehicles to hold or finance real estate and to offer tax advantages to investors. REITs must distribute 95 percent of taxable income to shareholders, which many consider to be equivalent to 80 percent to 85 percent of cash flow. REITs act as a conduit for the transfer of cash flow from real estate to investors without being taxed as a corporation. There are a variety of REITs including equity REITs, mortgage REITs, UPREITs, hybrid REITs and others. Recently, REITs have focused on specific property types and have evolved into shopping center REITs, hotel REITs, office building REITs, etc. The current attitude on Wall Street is that real estate is essentially a local, specialized business. Thus, if investors seek diversification, they can buy shares in REITs consisting of other property types or REITs that concentrate in specific geographic locations.

Equity REITs own, manage, buy and sell real estate. REITs are more than just real estate, however. They are operating businesses that include tangible assets (i.e., real estate) as well as intangible assets such as the quality and expertise of management. As a result, the value of a REIT can be more or less than the value of the underlying real estate. Some say REIT shares that trade at a premium above the value of the real estate have franchise value. While real estate assets are undoubtedly important, other factors influence share price as well.

## Advantages Of REITs

In addition to greater liquidity, advantages of securitization over private investment include diversification, a larger pool of available capital, known value, more abundant information and elimination of the cost and burden of direct management. These attributes explain why market participants may accept cash on cash returns from REITs that are lower than cash on cash returns from direct real estate investments in the private market.

The REIT market is efficient and liquid. Shares are bought and sold at central locations (i.e., stock

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exchanges). Once a buy/sell decision is reached, ownership can often be transferred instantaneously. Some REITs do, however, have thin liquidity. The liquidity of REITs is measured by bid-ask spreads.

Another benefit is the vast supply of capital in the public markets, which has been growing steadily. Although debt and equity funds raised in the public markets tend to be more expensive than conventional sources (i.e., banks, insurance companies, private placements, etc.), this cost may be more than offset by the availability and supply of capital for securitized transactions.

The value of REIT securities can be known instantaneously and with virtual certainty simply by viewing a quotron. There is no need to wait for an appraisal which may take several weeks to prepare and only provide a best-guess estimate.

One of the most striking features of the public markets is its abundance of information. This is attributable to governmental regulation, constantly improving technology and the insatiable appetite of decision-makers for information. This also contributes to the efficiency of the market.

Finally, REIT investment can reduce the cost and burden of direct management, an important characteristic of private ownership. This is particularly significant to institutional investors, such as insurance companies and pension funds. Direct investment in real estate might represent only 5 percent of a pension fund's assets but may require 40 percent of its staff to manage.

The typical anticipated holding period is also an important factor to consider. REITs appeal more to a trading mentality than to traditional participants in the private markets. Unlike individual assets, REITs are subject to short-term volatility. This is attractive to traders because such volatility creates opportunities for profit as they move in and out of different stock positions. One body of knowledge considers that REIT values also are immediately sensitive to interest rate movements, similar to stocks and bonds. Studies indicate a higher degree of correlation between the general stock market and REIT share prices, regardless of local market real estate trends. Private real estate owners typically have long-term investment horizons that often extend through several market cycles.

### REIT Renaissance

The recent surge in REIT popularity was caused by the focus of the RTC on securitization and a favorable interest rate environment. In addition, there was general illiquidity pervasive throughout the national real estate economy in the early 1990s resulting from the banking crisis and the temporary

disaffection of traditional capital sources for real estate. This forced owners to seek alternative capital sources. REITs enabled them to recapitalize their private investment in real estate at a time when more conventional forms of financing were unavailable. Paradoxically, some observers now are predicting a wave of de-REITing similar to the leveraged buyouts in the late 1980s. In any event, new attention has been given to REIT valuation methodology and, consequently, a body of knowledge has begun to develop.

### Terms Define The Industry

Before public market valuation is compared to private valuation theory, it is necessary to understand some basic terminology. *Dividends* are the net income of a company after debt and taxes and represent a portfolio cash flow. *REITs* can incur additional expenses at the corporate level such as corporate management and advisory fees that are not incurred by a property. The REIT benefits from the income derived from the operating entity, i.e., leasing commissions and management fees which can represent savings to the REIT. *Corporate dividends* are distributions to shareholders of corporate assets generally in the form of cash. In valuing single real estate assets, *net operating income* is income before debt and taxes, while *cash flow* is described as net income after deduction for debt.

A *price/earnings (P/E) ratio* is the relationship of a stock's price to the company's earnings. It is calculated by dividing the current share price by earnings per share. It is the relationship of price (equity value) to earnings (net income). Stated another way, a P/E ratio is an income multiplier. It is the reciprocal of an equity capitalization rate (as opposed to an overall capitalization rate) in single asset real estate valuation.

*Capitalization rates* are also used in estimating the value of corporations. "In the capitalization-of-income method of valuing a business, a cap rate is used to convert a single year income into a value estimate for the business as a whole. This method is appropriate when future income is expected to grow at a constant rate,"<sup>1</sup> says Randy Swad. This is similar to direct capitalization in real estate valuation.

Swad also notes that "A *discount rate* is used in the discounted future income method of valuing a business . . . the value . . . is the present value of all future after-tax cash flows."<sup>2</sup> This is similar to applying a discounted cash flow analysis, a form of yield capitalization, in the valuation of real estate in the private marketplace. Swad warns, however, that ". . . the discount or cap rate and the measure of income must be compatible, e.g., an after-tax discount rate should be applied to after-tax income."<sup>3</sup>

One method to value operating entities is to capitalize income utilizing a weighted average rate of return on invested capital. The weighted average rate of return is developed using the band-of-investment technique.

$$\begin{aligned} \text{WARR} = & (\text{After-tax rate of return on debt capital}) \\ & \times (\% \text{ of debt capital to sum of the debt}) \\ & + (\text{rate of return on equity capital}) \\ & \times (\% \text{ of equity capital to total equity}). \end{aligned}$$

The cash flows expected to be generated by a business are discounted to their present value using a WARR that reflects the relative risk of the investment as well as the time value of money. As illustrated by the above equation, the WARR is an overall return based on individual rates of return for invested capital (equity and interest-bearing debt), calculated by weighting the required returns on interest-bearing debt, preferred equity and common equity in proportion to their respective percentages of the company's capital structure.

The *rate of return on debt capital* is the rate a prudent investor would pay on interest-bearing debt. One method used to estimate the return on equity capital is known as a *Capital Asset Pricing Model (CAPM)*. CAPM estimates the rate of return on common equity as the current risk-free return on United States Treasury Bonds plus a market risk premium expected over the risk-free rate of return which is multiplied by the beta for the stock. *Beta* is a risk measure which reflects the sensitivity of a company's stock price to movements of the stock market as a whole.

### Public Market Valuation

In the case of REIT valuations, various other measures of performance have evolved due to the peculiar capital structure of those entities. One of the most important measures is *Funds From Operations (FFO)*. FFO is net income or "earnings" excluding gains or losses from debt restructuring and sales of property plus depreciation and amortization (excluding amortization of deferred financing costs and depreciation of non-real estate assets) and adjustments for unusual items. This is a revised definition of FFO as established by the National Association of Real Estate Investment Trusts (NAREIT) that became effective in 1996. Wall Street analysts have also developed FFO multiples for comparative purposes. Some critics maintain that FFO may not be representative of true operating profitability because it may not account for leasing commissions, tenant improvements and recurring capital expenditures. Although this is an important measure of performance used by the securities market, analysts are continuously developing other units of comparison, such as cash available for distribution (CAD) and many others.

## FIGURE 1

REIT Yields — Year-End 1994

### Yield on Equity (Ye) (%)

$$\text{Ye} = \text{Dividend Yield} \div \text{Dividend Payout Ratio}$$

$$\text{Ye} = 7.67\% \div 85\%$$

$$\text{Ye} = 9.02^1$$

### Yield on Overall Assets (Ya)

$$\text{Ya} = \text{Equity Yield} \times (\% \text{ Equity}) + \text{Debt Yield} \times (\% \text{ Debt})$$

$$\text{Ya} = 9.02\% \times (0.65) + 7.75\% \times (0.35)$$

$$\text{Ya} = 8.5\%$$

### Implied Capitalization Rate (Yo)

$$\text{Yo} = \text{FFO Yield on Assets} + \text{Corporate Overhead (Management Expense}^2)$$

$$\text{Yo} = 8.58\% + 0.70\%$$

$$\text{Yo} = 9.28\%$$

<sup>1</sup>Some people adjust for floating-rate debt.

<sup>2</sup>Management expense is the average "reasonable cost of doing business" for a REIT.

Glen Mueller succinctly presented three measures of REIT yield performance for year-end 1994: yield on equity or dividend yield, yield on overall assets (i.e., debt and equity, similar to WARR), and an implied capitalization rate consisting of FFO yield on assets plus corporate overhead. They are presented in Figure 1.<sup>4</sup>

Mueller also observed that "public market vehicles react more quickly to economic and financial market movements than do private market prices"<sup>5</sup>. Because the capital markets are better informed and capable of reacting quickly to change, damage in relative terms can be minimized. At the same time and perhaps more important, opportunities for profit can be exploited.

### Private Marketplace

The private marketplace is characterized by inefficiency but also by control. The latter is perceived by some as the single greatest advantage of private ownership. Price variations in this market reflect differences in a property's physical condition and economic attributes, the legal interest conveyed, perceived level of risk, competitive investment environment, buyer/seller motivations, exposure to the market and structure of the transaction. However, there is no central marketplace. Information is often dated and incomplete, capital sources are limited, exit strategies are difficult to execute because of the time required to dispose of an asset and concepts of pricing are often imprecise.

### Private Market Valuation

Property values in the private market are measured by direct and yield capitalization techniques. One of the most common methodologies consists of developing an overall capitalization rate, which can

reflect assumptions on changes in a property's value or cash flow. Since this market is motivated by opportunities for leverage, overall capitalization rates also reflect the requirements of debt and equity positions. In other situations, particularly those involving institutional investors, overall capitalization rates can be developed assuming a property is free and clear.

Overall rates are applied to a property's net operating income (NOI) or income after property expenses but before debt and taxes. That there is no true equivalent of NOI in the REIT format underscores the differences between business and real estate valuation and the danger of casual comparisons. Capitalization rates can also be applied to a property's net income after income taxes. As Swad points out in REIT valuations, care must be exercised to apply pre and after-tax capitalization rates depending on the appropriateness of the situation.

Another variation is to apply capitalization rates to a property's cash flow or income after debt service. This is known as equity capitalization, because it derives an estimate of the value of the equity position in a property. The equity capitalization rate is also known as the cash-on-cash return. Cash flow to a property is not similar to the earnings of a REIT because cash flow in the private market is before debt and taxes.

Cash flow before debt and taxes is also normally used in discounted cash flow analysis of a single property. In business valuation, future earnings are discounted to a present value. Some contend that analysts should discount FFO.

### **The Business Of REITs**

Comparison of REIT values to individual property values is difficult notwithstanding that many general valuation principles are common to both markets and academic exercises that derive adjusted capitalization rates purported to quantify the difference between REIT cap rates and those of individual properties. While there are considerable variations in terminology, other differences are more profound. In addition to issues of liquidity, trading and informational efficiency and accessibility to capital, the most obvious difference is one of basic nature. REITs are operating businesses. When investors purchase REIT shares they are acquiring not only the company's real estate portfolio of cash flows but also its management and other intangible assets. REITs can capture certain expenses, such as management fees and leasing commissions. When properties are purchased privately, investors acquire the bricks and mortar as well as the income stream secured by the leases which is reduced by the cost of property management and leasing fees.

There also has been a collision of the securities and real estate industries. Traditional participants in the private real estate market are generally small, highly independent and entrepreneurial, proprietary and strongly resistant to change. Attendant disciplines have developed their own valuation methodologies and pricing mechanisms. While many writers indicate that appraisals are backward looking, in actuality, when properly prepared the value in an appraisal represents the anticipation of future benefits with a longer term investment horizon than anticipated by stock market investors. Wall Street, including the rating agencies, has imposed new standards of analysis on real estate, but these standards are comparable in some respects to traditional factors considered by real estate appraisers. Wall Street analysts treat real estate as corporations, sometimes ignoring the effect of long term contractual obligations (i.e., leases greater than five years). Cash flow has become king but that is also true in the private market with less emphasis placed on forecasting.

### **Conclusion**

This article was not intended to be judgmental. Rather, it presented several differences between the public and private real estate markets and methods of analyses. The intent was to better understand how the public and private markets relate to one another and to demonstrate how casual comparisons are often misleading or sometimes incorrect. At the same time, it is absolutely essential for participants in one market to understand the other market, because they are inextricably linked. The emerging public market will continue to grow and profoundly influence privately traded real estate, capital formation, pricing and market fundamentals. For short periods, capital availability is likely to have as much influence on price as actual demand. Information, even in the inefficient private market, will become increasingly more important.

### **NOTES**

1. Swad, Randy, "Discount and Capitalization Rates in Business Valuations," *The CPA Journal* (October 1994): 40.
2. *Ibid.*, 40.
3. *Ibid.*, 40.
4. Mueller, Glen R., Ph.D., Keith R. Pauley, CFA, William K. Monrill, Jr., "A Primer For Private And Public Equity Choices In A Real Estate Portfolio Management Context," *Real Estate Finance*, 17.
5. *Ibid.*, 17-18.

# CAPITALIZATION RATES, DISCOUNT RATES AND REASONABLENESS

by D. Richard Wincott, CRE,  
Kevin A. Hoover and  
Terry V. Grissom, CRE

In today's real estate markets, a tremendous emphasis is placed on the income capitalization approach to value, primarily the direct capitalization and discounted cash flow techniques. As a result, there seems to be continuing discussions regarding the relationship between the capitalization rate ( $R_O$ ) and yield rate ( $Y_O$ ) employed in the respective analyses. This relationship is generally stated in the equation  $R_O = Y_O - CR$ , where CR represents the constant ratio change in income and value.

This formula is perhaps the most misunderstood, overused and oversimplified property model. While some professionals swear by it, others disregard it as being completely invalid and not applicable in the real world. This article presents a practical analysis of the relationship between  $R_O$  and  $Y_O$  by addressing the inherent problems in the  $R_O = Y_O - CR$  formula when applied to day-to-day analyses.

In general, there are two assumptions inherent in the  $R_O = Y_O - CR$  formula that many overlook. First, this property model assumes that the capitalization rate and the yield rate are being applied to essentially the same income stream. In other words, the derivation of the income estimates in the two techniques must be the same. In practice, however, investors typically capitalized stabilized net operating income prior to capital cost deductions, while discounting the cash flow estimate after accounting for such costs as tenant improvement allowances and leasing commissions. Consequently, an adjustment to the property model is required.

The second assumption inherent in the model is that income and value grow at the same rate over the assumed holding period, and that the growth occurs on a constant ratio basis. Yet in the discounted cash flow models used by appraisers and investors, the growth in income and the growth in value often differ due to differences in the going-in and terminal capitalization rates as well as deductions for cost of sale in calculating the reversion estimate.

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*Terry V. Grissom, CRE, MAI, Ph.D., is an associate professor of real estate at Georgia State University, Atlanta, School of Business Administration. His 20 years of real estate experience includes consulting, appraising and development, and he is also experienced in institutional investment research and portfolio analysis.*

Given these discrepancies between the inherent assumptions in the  $R_O = Y_O - CR$  model and the practical application of the discounted cash flow models, modifications to the property model are required in order to accurately reflect the relationship between  $R_O$  and  $Y_O$ .

### Simple Model

The following scenario illustrates the  $R_O = Y_O - CR$  property model. This simple scenario is based on a year one income estimate of \$1,000 and a compound growth rate of 4.0 percent. The reversionary value at the end of the 10 year holding period is estimated by capitalizing the 11th year income estimate at 10.0 percent, and the total present value of the income stream is derived using a discount rate of 14.0 percent. The cash flow estimates and present value calculations are summarized in Exhibit I.

#### EXHIBIT I

Growth Rate	4.00%
Discount Rate	14.00%
Terminal Capitalization Rate	10.00%

Period	Income	Present Value Factor @ 14.0%	Present Value
1	\$1,000.00	0.877193	\$877.19
2	1,040.00	0.769468	800.25
3	1,081.60	0.674972	730.05
4	1,124.86	0.592080	666.01
5	1,169.86	0.519369	607.59
6	1,216.65	0.455587	554.29
7	1,265.32	0.399637	505.67
8	1,315.93	0.350559	461.31
9	1,368.57	0.307508	420.85
10	1,423.31	0.269744	383.93
11	1,480.24		
Reversion	14,802	0.269744	3,992.87
<b>Total Present Value</b>			<b>\$10,000</b>
<b>Implied Capitalization Rate</b>			
$\$1,000 / \$10,000 =$			10.00%
$Y_O - CR = R_O$			
$14.0\% - 4.0\% =$			10.00%

As the data indicates, the total present value approximates \$10,000, resulting in an implied capitalization rate ( $R_O$ ) of 10.0 percent ( $\$1,000 \div \$10,000$ ). This model reflects the  $R_O = Y_O - CR$  property model in its simplest form, as  $14.0\% - 4.0\% = 10.0\%$ . However, note that the capitalization and yield rates are applied to the same income stream, and the CRs for both income and value are equal.

### Net Operating Income Vs. Cash Flow

The first problem to be addressed results from capitalizing net operating income while discounting cash flow after an allowance for capital costs. These deductions typically include such costs as tenant improvement allowances, leasing commissions and reserves for replacements. Given this difference, the  $R_O = Y_O - CR$  model must be adjusted.

Consider Exhibit II, which again reflects a net income of \$1,000, escalating at 4.0 percent over a 10 year holding period. However, a deduction is made for capital costs reflecting average tenant improvement allowances and leasing commissions. This deduction equates to \$50.00 in year one, and also escalates at 4.0 percent over the holding period. The resulting cash flow is discounted at the yield rate of 14.0 percent.

The reversion again is calculated by capitalizing the 11th year net operating income; however, the terminal capitalization rate was adjusted to 10.5263 (10.53) percent so that the constant ratio change in property value would equal 4.0 percent, commensurate with the change in income.

As the data indicates, the total present value of the income stream approximates \$9,500, resulting in an implied capitalization rate ( $R_O$ ) of 10.53 percent. However,  $Y_O$  (14.0 percent) - CR (4.0 percent) equals 10.00 percent. The discrepancy between the implied capitalization rate of 10.53 percent and the rate implied by the property model of 10.00 percent results from the capitalization analysis employing the net income while the discounted cash flow analysis applies to the cash flow.

The implied capitalization rate of 10.00 percent can be adjusted for the differences in the income estimates by dividing the implied  $R_O$  by the ratio of average cash flow to net operating income. The adjustment to the formula is summarized:

$$(Y_O - CR) / (1 - \text{Capital Cost Ratio}) = RO$$

Where the Capital Cost Ratio equals the average ratio of capital expenses to net operating income

$$(14.0\% - 4.0\%) / (1 - 0.05) = 10.53\%$$

As indicated, the adjusted rate is equivalent to the implied capitalization rate derived by dividing the net income (\$1,000) by the total value indication of \$9,500. In practice, derivation of the capital cost ratio can be difficult, since capital deductions seldom occur on a straight line basis. Rather, the deductions typically fluctuate with various occurrences such as tenant rollover. Consequently, the ratio must be selected that reflects the average relationship between the cash flow and net income estimates. The timing of these costs must also be

## EXHIBIT II

Growth Rate	4.00%
Discount Rate	14.00%
Terminal Capitalization Rate	10.53%

Period	Income	Capital Costs	Cash Flow	Present Value Factor @ 14.0%	Present Value
1	\$1,000.00	\$50.00	\$ 950.00	0.877193	\$833.33
2	1,040.00	52.00	\$ 988.00	0.769468	760.23
3	1,081.60	54.08	\$1,027.52	0.674972	693.55
4	1,124.86	56.24	\$1,068.62	0.592080	632.71
5	1,169.86	58.49	\$1,111.37	0.519369	577.21
6	1,216.65	60.83	\$1,155.82	0.455587	526.58
7	1,265.32	63.27	\$1,202.05	0.399637	480.39
8	1,315.93	65.80	\$1,250.14	0.350559	438.25
9	1,368.57	68.43	\$1,300.14	0.307508	399.80
10	1,423.31	71.17	\$1,352.15	0.269744	364.73
11	1,480.24	74.01	\$1,406.23		
Reversion	14,062			0.269744	3,793.24
<b>Total Present Value</b>					<b>\$9,500</b>
<b>Implied Capitalization Rate</b>					
	\$1,000 / \$9,500 =				10.53%
$Y_O - CR = R_O$					
	14.0% - 4.0% =				10.00%

considered, as reflected by such factors as the average remaining lease term for existing tenants.

### Differences In Income And Value Growth

Most would agree that we seldom see cash flow models in which the growth in income and the growth in value over a 10 year holding period are equal. The differences in the growth rates can be caused by a number of factors that may include differences between the going-in and terminal capitalization rates, deductions for costs of sale in the reversion calculation and deductions for anticipated capital expenditures at the reversion. Consider Exhibit III which employs an income estimate of \$1,000 growing at 4.0 percent over the 10 year period, commensurate with the initial simple scenario. However, the reversionary value is calculated using a capitalization rate of 11.0 percent.

Based on a yield rate of 14.0 percent, the total present value of the income stream approximates \$9,637.01, resulting in an implied capitalization rate of 10.38 percent. In this model, the  $R_O = Y_O = CR$  model is difficult to apply, because the constant ratio change in income approximates 4.0 percent, while the constant ratio change in value approximates 3.40 percent, with the difference resulting from the higher terminal capitalization rate.

The discrepancy between the income and value CRs is exacerbated by current applications in the discounted cash flow analysis. Analysts typically

## EXHIBIT III

Growth Rate	4.00%
Discount Rate	14.00%
Terminal Capitalization Rate	11.00%

Period	Income	Present Value Factor @ 14.0%	Present Value
1	\$1,000.00	0.877193	\$877.19
2	1,040.00	0.769468	800.25
3	1,081.60	0.674972	730.05
4	1,124.86	0.592080	666.01
5	1,169.86	0.519369	607.59
6	1,216.65	0.455587	554.29
7	1,265.32	0.399637	505.67
8	1,315.93	0.350559	461.31
9	1,368.57	0.307508	420.85
10	1,423.31	0.269744	383.93
11	1,480.24		
Reversion	13,457	0.269744	3,629.88
<b>Total Present Value</b>			<b>\$9,637</b>
<b>Implied Capitalization Rate</b>			
	\$1,000 / \$6,637 =		10.38%
$Y_O - CR = R_O$			
	14.0% - 4.0% =		10.00%

make a deduction for costs of sale in calculating the reversion, but no such deduction is included in the direct capitalization analysis given the derivation of  $R_O$ . Further, it has become common practice to make a deduction in the reversion for capital items affecting the property at the time. These applications tend to widen the disparity between the CRs of the income stream and the value.

One method for adjusting the property model involves weighting the income and value CRs based on the percentage of total present value represented by the income stream and reversion. In this case, the present value of the income stream approximates 62.33 percent of the total present value, with the present value of the reversion approximating 37.67 percent of the total present value. Weighting the income and value CRs based on these percentages produces a weighted CR of 3.77 percent (4.00 percent  $\times$  62.33 percent) + (3.40 percent  $\times$  37.67 percent). The adjusted model is summarized:

Income CR =	4.00%
Value CR =	3.40%
Present Value of Income as a Percentage of Total Present Value	62.33%
Present Value of Reversion as a Percentage of Total Present Value	37.67%
Weighted CR	3.77%
$Y_O - \text{Weighted CR} =$	$R_O$
14.0% - 3.77% =	10.23%

This model implies an  $R_O$  of 10.23 percent, which is a close approximation of the implied capitalization rate of 10.38 percent. However, the model is not exactly accurate, and the variance will increase as the differences between the income and value CRs increase.

The weighted CR adjustment is technically invalid because the change in property value is not recognized in the discounting process on an annual basis, but rather in one lump sum at the end of the holding period. For example, assume three identical properties each reflecting current values of \$10,000. Property A's value increases 10 percent in year one and remains flat for the remaining nine years of the 10 year holding period. Property B's value is flat for the first nine years of the holding period, and escalates 10 percent in the 10th year. Property C's value increases by one percent per year on a straight line basis over the 10 year holding period. In each case, the value at the reversion approximates \$11,000, and in the discounted cash flow model, no value difference would be recognized since the proceeds to the owner from increases in value are not assumed to be received until the property is sold at the end of the holding period.

The Ellwood formula shown here can be used to address this discrepancy.

$$R_O = [Y_E - M(Y_E + P^*1/S_n * R_M) - D^*1/S_n] / K$$

The inapplicability of the Ellwood formula in this case is that it employs equity yield rates as opposed to property yield rates and considers the effect of financing. Since properties are typically analyzed on an unleveraged basis, the formula does not appear to be applicable in this instance. However, by eliminating the middle part of the numerator of the formula which deals with the mortgage financing, the  $Y_E$  in essence becomes a property yield rate,  $Y_O$  as reflected in the following formula.

$$R_O = [Y_O - (D^*1/S_n)] / K$$

Where $K = \{1 - [(1 + C)^n / S_n]\} / (Y - C) * A_n$
$K$ = Income Adjustment Factor
$D$ = Total Property Value Change
$1/S_n$ = Sinking Fund Factor
$C$ = Constant Ratio Change in Income
$S_n$ = Future Value Factor
$A_n$ = Present Value Factor of an Annuity

Employing this formula allows the change in income to be addressed on a constant ratio basis and adjusted using the  $K$  factor calculation, while the change in the property value is addressed on a total basis and adjusted for using a sinking fund factor at the property yield rate. The following summarizes the calculations based on the previous model.

$$R_O = [Y_O - (D^*1/S_n)] / K$$

$D$ =	39.64%
$1/S_n$ (10 yrs @ 14%) =	0.0517135
$C$ =	4.00%
$S_n$ (10 yrs @ 14%) =	3.7072213
$A_n$ (10 yrs @ 14%) =	5.2161156
$K = \{1 - [(1 + 4.0\%)_{10} / 3.7072213]\} /$ $(14.0\% - 4.0\%) * 5.2161156 =$	1.1516487
$R_O = [14.0\% - (39.64\% * 0.0517135)] /$ $1.1516487 =$	10.38%

The property model results in an implied  $R_O$  of 10.38 percent, exactly equaling the capitalization rate derived by dividing the net income of \$1,000 by the total present value of \$9,673.01.

### Real World Application

Having addressed the two primary problems with the  $R_O = Y_O - CR$  formula, the two revised models can be combined as shown below and applied to actual property scenarios.

$$R_O = \{[Y_O - (D^*1/S_n)] / K\} / (1 - \text{Capital Cost Ratio})$$

In order to demonstrate the validity of this analysis, we have presented the actual income estimates for a

**EXHIBIT IV**

Discount Rate	12.00%
Terminal Capitalization Rate	8.50%
Costs of Sale	2.00%

Period	Income	Capital Costs	Cash Flow	Present Value Factor @ 12.0%	Present Value
1	\$ 674,700.00	\$13,900.00	\$660,800.00	0.892857	\$590,000.00
2	709,800.00	16,800.00	693,000.00	0.797194	552,455.36
3	721,500.00	22,300.00	699,200.00	0.711780	497,676.75
4	768,400.00	10,100.00	758,300.00	0.635518	481,913.36
5	785,600.00	20,700.00	764,900.00	0.567427	434,024.80
6	820,700.00	45,100.00	775,600.00	0.506631	392,943.10
7	863,900.00	9,200.00	854,700.00	0.452349	386,622.87
8	904,500.00	22,900.00	881,600.00	0.403883	356,063.45
9	925,300.00	24,600.00	900,700.00	0.360610	324,801.45
10	965,200.00	18,700.00	946,500.00	0.321973	304,747.67
11	1,005,900.00	24,800.00	981,100.00		
Reversion	11,597,435			0.321973	3,734,063.78
<b>Total Present Value</b>					<b>\$8,055,313</b>
<b>Implied Capitalization Rate</b>					<b>8.38%</b>
	$\$674,700 / \$8,055,313 =$				
<b>Net Income CR =</b>					<b>4.0745%</b>
<b>Total Value Change =</b>					<b>43.9725%</b>
<b>Average Capital Cost Ratio =</b>					<b>2.51%</b>
	$(\Sigma \text{ of Capital Costs} / \Sigma \text{ of NOI})$				
$R_O = \{ [Y_O - (D * 1/S_n)] / K \} / (1 - \text{Capital Cost Ratio})$					
	$K = \text{Factor } [1 - (1 + 4.07\%)^{10} / 3.1058482] / (12\% - 4.07\%) * 5.6502230$				1.1611577
	$D = \text{Total Property Value Change}$				43.9725%
	$1/S_n = \text{Sinking Fund Factor (10 yrs. @ 12\%)}$				0.0569842
	$C = \text{Constant Ratio Change in Income}$				4.0745%
	$S^n = \text{Future Value Factor (10 yrs. @ 12\%)}$				3.1058482
	$A_n = \text{Present Value Factor of an Annuity (10 yrs. @ 12\%)}$				5.6502230
$R_O = \{ [12.0\% - (43.97\% * 0.0569842)] / 1.1611577 \} / (1 - 0.0252)$					
<b>R<sub>O</sub> =</b>					<b>8.39%</b>

major retail facility along with the assumptions used in the discounted cash flow analysis. This data is presented in Exhibit IV.

The model indicates an R<sub>O</sub> of 8.39%, which is essentially equal to the implied R<sub>O</sub> of 8.38%. By adjusting for the differences between net income and cash flow, as well as the differences in the income and value growth, the property model accurately depicts the relationship between R<sub>O</sub> and Y<sub>O</sub>.

**Conclusion**

All investment properties are unique and reflect a broad range of characteristics that impact potential

income and therefore impact value. While we are not suggesting these dynamic investments be “put in a box,” by use of a simple formula, we have concluded that there is a definite relationship between the appropriate Y<sub>O</sub> and R<sub>O</sub> for a given property. Understanding that relationship is essential in the process of selecting the appropriate rates, the key to understanding the relationship lies in an accurate analysis of the income characteristics that drive the direct capitalization and discounted cash flow analyses.

# PRICING RISK: CHOOSING A DISCOUNT RATE\*

by Kenneth P. Riggs, Jr., CRE

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The discounted cash flow (DCF) is the most widely used and reliable method of simulating the performance of an institutional real estate investment over its holding period. Yet a key factor in DCF valuation, the discount rate continues to generate debate and often appears to receive inadequate consideration in the real world where irrational behavior seems to dominate. For some professionals a discount rate analysis is more a gut instinct than a systematic analysis. From a theoretical standpoint, in-depth analysis incorporates modern portfolio theory but, unfortunately, it relies too heavily on historical data and assumes a high level of available current data. There is a rate derivation between “trust me”, and modern portfolio theory’s Capital Asset Pricing Model (CAPM).

In analyzing a property’s value to a particular investor, the analyst identifies the components of future benefits—cash flows and reversionary value—and determines their variability and timing over a specific holding period. The future benefits then are discounted to present value, which represents the price a typical investor should be willing to pay for the investment at the date of valuation. The discount factor used in this process must reflect the total required return to the investment position—both income and capital appreciation—as well as the degree of risk associated with the investment.

How does an analyst arrive at an appropriate and logical discount rate? In this article the framework is presented from a qualitative and quantitative (actual data) perspective, and commonly used approaches are explored.

## Transaction Data

The best indicators for required investment return are the discount rates currently employed in actual real estate transactions. Two significant problems associated with this source of data are obtaining the data and the infrequency of real estate transactions. Real estate, by its nature, does not lend itself to continuous efficient trading mechanisms, such as those used by the stock and bond markets. Real estate trades are infrequent, and their terms are highly property specific; the number of trades germane to a particular analysis is limited. Moreover, details on transactions rarely are available to the public. Although institutional real estate advisors and investors usually compile performance reports internally and many participate in public databases,

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these data typically are retrospective and involve realized returns rather than rates currently anticipated or targeted. In most instances, information about prospective investment criteria is available only to those involved in the transaction.

When such proprietary transaction data can be secured by an analyst, it is preferable to other sources since it attests to actual transactions made under current market conditions. Even then, however, transaction data has its limitations. DCF analysis is complicated, and its supportability is weakened by not being able to compare individual earning structures. In addition, researching transaction data is extremely time-consuming, whether the analyst is examining historic returns or discussing investment criteria with investors currently active in the market. Remember, the analyst is estimating an unleveraged discount rate for private market transactions; transactions or return data from alternative sources need to be adjusted.

Transaction data provide the best support for discount rate assumptions, but their value to the analyst is clearly dependent on the quantity and quality of data available. Generally, an analyst can find samples of sales with the targeted internal rate of return (IRR) or discount rate. The following excerpt is an analysis of a recent consultation.

*Our analysis considered available information regarding rate expectations from shopping mall sales. The rate information from the comparable sales—higher risk profile sales—indicate discount rates of 11.5% to 13.3% for unleveraged transactions. The subject is consistent to slightly better in both earning structure and location relative to the comparable sales, indicating a discount rate toward the lower end of the range. The buyers involved in the acquisition of these regional shopping malls were interviewed by the analyst. The interviewees strongly concur that a yield of 10.5% to 11.0% is appropriate for high quality malls, and a yield of 11.0% to 11.5% is appropriate for lower quality but market dominant malls. Further, these buyers add that older/riskier properties, similar to the subject, in today's retail environment would have discount rates in excess of this range, or 11.5% to 13.0%. This brings a current view into the analysis and confirms the range indicated by the sale data. For the subject analysis, we conclude that based on actual transactions, a discount rate of 11.5%-13.0% to be appropriate.*

### **Real Estate Indexes**

The most widely utilized database of historic real estate equity returns is the NCREIF Real Estate Property Index published by the National Council of Real Estate Investment Fiduciaries. Other sources for these data are the National Association of Real Estate Investment Trusts [NAREIT] and Evaluation Associates, Inc. The NCREIF Classic Property Index (NCPI) is the most relevant, despite

some limitations, for the purposes described in this article. The index is widely available, and the time series covers a lengthy real estate cycle, although it may not suffice to filter out unusual cycles. Although the NAREIT Index is market based, we cannot use its return data for real estate discount rate derivation purposes because a NAREIT data reflects returns from leveraged real estate and returns are based on trading of operating company shares rather than property returns.

The NCREIF quarterly time series, which runs from 1978 to the present, reflects the performance of income-producing properties owned by commingled funds on behalf of qualified pension and profit-sharing plans or owned directly by these trusts and managed on a separate account basis. As of December 1995, 1,850 properties valued at \$28.94 billion were included in the index. The data represents returns from unleveraged properties. Returns are given for all property types, excluding hotels, and are broken down by income and appreciation on a national and regional basis.

NCREIF return data are based on the actual sale prices or appraised values of real estate properties. However, the use of appraisal data raises the issue of inherent biases with respect to the capital component. Critics have argued that appraisal-based conclusions do not mark the properties to market every year. Based on the few statistical studies that have addressed this issue, appraisal bias is evident in the short term but not the long term.<sup>1</sup> Thus, the return variances would not be pronounced over the entire holding period. However, because returns are reported quarterly, the income component is fairly reliable.

Another consideration with NCREIF data is that it represents actual or realized total returns rather than the expected or promised returns required for DCF analysis. The difference between the expected rate at the time of investment and the rate achieved upon sale is known as the *loss attributable to default*. By the pure nature and historical period of this index, default risk does not appear to be reflected in NCREIF data, whereas in prospective or expected return data, a risk premium has to be embedded in the rate. The analyst must adjust for this factor if the NCREIF Index is to serve as a useful benchmark for discount rates. Alternative market indexes, stocks and bonds are argued to have this default premium reflected in their historical data due to long periods, per the market, that reflect equally below average and above average return periods. This canceling effect creates a historical return that will be consistent with future returns.

TABLE 1

Annualized Historical Quarterly Return Series

Year & Quarter	NCREIF Classic Index			S&P 500	Lehman G/C	T-Bills	CPI
	Income	Capital	Total				
841	7.49	6.89	14.76	8.63	5.23	9.12	4.74
842	7.42	7.79	15.63	-4.69	1.77	9.44	4.22
843	7.37	7.12	14.87	4.69	8.60	9.77	4.20
844	7.37	5.38	13.04	6.10	15.00	9.97	3.95
851	7.40	4.23	11.86	18.73	16.88	9.77	3.75
852	7.43	3.04	10.65	30.75	28.71	9.25	3.74
853	7.54	2.97	10.68	14.31	21.18	8.44	3.18
854	7.52	2.45	10.10	31.57	21.33	7.68	3.77
861	7.56	2.07	9.75	37.42	28.91	7.25	2.26
862	7.49	1.49	9.06	35.41	20.66	6.90	1.74
863	7.35	0.50	7.88	31.44	20.67	6.53	1.75
864	7.27	-0.60	6.63	18.21	15.60	6.17	1.13
871	7.22	-0.76	6.42	25.74	8.09	5.90	3.04
872	7.08	-2.10	4.86	25.08	4.68	5.72	3.72
873	7.06	-1.23	5.77	43.31	-0.38	5.83	4.30
874	7.03	-1.47	5.49	5.17	2.30	5.91	4.40
881	6.99	-1.42	5.50	-8.32	4.43	5.93	3.89
882	7.06	-0.03	7.03	-7.11	7.48	6.05	3.93
883	7.02	-0.20	6.81	-12.55	12.78	6.28	4.20
884	7.05	-0.01	7.04	16.50	7.59	6.76	4.42
891	7.03	0.01	7.03	17.90	5.01	7.50	4.98
892	6.91	-0.04	6.86	20.40	12.35	8.22	5.17
893	6.80	-0.11	6.69	32.73	11.32	8.54	4.34
894	6.71	-0.48	6.21	31.43	14.24	8.64	4.65
901	6.63	-0.61	5.99	19.05	11.70	8.46	5.23
902	6.61	-0.80	5.76	16.32	7.11	8.22	4.67
903	6.61	-2.08	4.43	-9.38	6.75	8.11	6.16
904	6.71	-4.99	1.47	-3.19	8.28	7.90	6.11
911	6.74	-6.29	0.14	14.40	12.49	7.53	4.90
912	6.44	-7.67	-1.23	7.40	10.22	6.93	4.70
913	6.91	-8.96	-2.51	31.29	15.86	6.37	3.39
914	6.90	-12.34	-6.07	30.55	16.13	5.75	3.07
921	7.06	-12.49	-6.09	11.04	11.38	5.14	3.18
922	7.69	-13.39	-6.83	13.46	14.17	4.65	3.09
923	7.49	-13.52	-6.81	11.01	13.23	4.06	2.99
924	7.73	-11.66	-4.60	7.68	7.58	3.61	2.90
931	8.03	-11.16	-3.81	15.27	14.30	3.35	3.04
932	8.14	-11.21	-3.76	13.60	13.15	3.13	2.87
933	8.43	-9.69	-1.97	13.01	11.45	3.07	2.58
934	8.76	-7.39	0.88	9.99	11.03	3.07	2.64
941	8.86	-6.72	1.70	1.43	2.78	3.10	2.39
942	8.94	-4.56	4.08	1.33	-1.45	3.33	2.41
943	9.05	-4.22	4.55	3.66	-4.13	3.67	2.86
944	9.16	-2.28	6.73	1.33	-3.50	4.21	2.53
951	9.27	-2.00	7.14	15.59	4.59	4.85	2.99
952	9.34	-1.30	7.95	26.11	12.77	5.35	3.05
953	9.41	-0.82	8.53	29.80	14.35	5.68	2.55
954	9.46	-0.50	8.93	37.50	19.24	5.75	2.72
Average	7.57	-2.52	4.90	15.44	10.91	6.39	3.59
Standard Deviation	0.84	5.50*	5.79	13.72	7.25	2.01	1.09

\*subject to appraisal smoothing

Source: NCREIF Classic Property Index; RERC

TABLE 2

Annualized Performance, Periods Ending December 31, 1995

Period	NCREIF Classic Retail Index							NAREIT Share Price Equity	NCREIF Classic Property Index			
	Income	Capital	Total	S&P 500	Lehman G/C	T-Bills	CPI		Lehman 10 Year	Income	Capital	Total
13 years	7.40	0.72	8.16	15.87	10.78	6.47	3.56			7.63	-2.34	5.16
12 years	7.28	0.31	7.60	15.34	11.02	6.27	3.54			7.62	-2.94	4.51
11 years	7.20	-0.33	6.85	16.22	10.66	5.94	3.50	9.70	11.02	7.64	-3.67	3.77
10 years	7.15	-0.75	6.36	14.79	9.65	5.77	3.47	8.79	10.24	7.66	-4.26	3.16
9 years	7.12	-1.26	5.80	14.41	9.01	5.72	3.74	7.69	9.29	7.70	-4.66	2.78
8 years	7.16	-1.95	5.10	15.62	9.88	5.69	3.65	8.56	11.03	7.78	-5.05	2.44
7 years	7.17	-3.04	3.97	15.49	10.21	5.54	3.54	8.80	10.68	7.89	-5.75	1.80
6 years	7.29	-4.15	2.91	13.03	9.55	5.03	3.36	8.57	10.99	8.09	-6.60	1.08
5 years	7.46	-4.90	2.28	16.59	9.81	4.47	2.82	8.87	17.17	8.36	-6.91	1.01
4 years	7.72	-4.03	3.46	13.34	8.28	4.15	2.76	8.17	12.98	8.73	-5.51	2.86
3 years	7.96	-2.58	5.23	15.29	8.51	4.34	2.71	7.92	12.48	9.07	-3.45	5.39
2 years	8.14	-2.44	5.55	18.04	7.27	4.98	2.69	5.45	9.05	9.28	-1.31	7.88
1 year	8.44	-2.42	5.86	37.50	19.24	5.75	2.72	17.14	15.26	9.46	-0.50	8.93

Source: NCREIF Classic Property Index; RERC

Finally, the index is an aid for analyzing risk-adjusted returns (as measured by the standard deviation) of various classes of real estate. This analysis, which can be disaggregated between income and capital components, allows for a more quantitative comparison with alternative investment returns. Adjustment of the appraised capital values (unsmoothing) may be employed to determine a more representative measure of volatility. In sum, the NCREIF Property Index, if thoroughly understood and properly used, can serve as a basis for the selection of an appropriate discount rate.

The following applies the index data to a retail center.

Tables 1 and 2 reflect data for NCREIF, along with other relevant return series. Table 1 depicts the annual returns by quarter for all real estate property types from the first quarter of 1984 to the fourth quarter of 1995. The table also shows the annual returns by quarter for competitive assets such as stocks and bonds. In sum, the NCREIF Property Index can serve as a rough proxy for the selection of a discount rate; however, a longer term average is preferable, since the recent data is skewed by significant write downs.

Table 1 indicates that actual, annualized, quarterly reported returns for the period of 1984 through 1995 have averaged 4.90% for the NCREIF Index. In contrast, stocks have averaged approximately 15.44% per year and government T-bills approximately 6.39%. The standard deviation for stocks, as represented in the S&P 500, demonstrated the greatest volatility at approximately 13.72%. Income returns (i.e., cash-on-cash yields) for real estate are significantly more stable, exhibiting a standard deviation of only 0.85% and a return of 7.57%.

A derivative approach in using the series is to use the property-specific income component with an adjustment made for required capital changes and default risk. Table 2 entitled "Annual Performance" indicates a 13-year average income return of 7.40% for retail properties, though recent returns were 8.44%. Given the recent investment characteristics of the asset class and the location of the subject, we have chosen to use 8.0% as a property-specific income component in our derivative calculation. Adjusting this figure 400 to 500 basis points (based upon historical information and judgment) for default risk, anticipated capital changes and the high earning structure risk of the subject, results in a discount rate estimate ranging from 12.0% to 13.0%.

### Investment Surveys

Surveys of pension funds, pension fund advisors, lending institutions, corporate and other investors provide timely insights into current investment criteria. Real Estate Research Corporation (RERC) has conducted and published this type of investment survey since 1979.<sup>2</sup> The RERC's quarterly survey augments the expectation yield rate responses with personal interviews and monitors change in market fundamentals, such as capital availability, supply and demand in each asset class and overall investment strategies. The investment criteria detailed in the survey include current property-type preferences, income and expense growth rates and the targeted (ex ante) yield rates used by real estate investors in discounted cash flow analyses. Within the context of this analysis, an expected (ex ante) yield rate is equal to the discount rate that is being estimated. The following provides an elementary discussion on the use of a survey to estimate an appropriate discount rate.

TABLE 3

Real Estate Investment Criteria by Property Type. First Quarter 1996\*

	INDUSTRIAL		RETAIL			OFFICE		APARTMENT	HOTEL
	Warehouse	R&D	Regional Mall	Power Center	Neighborhood/Community	CBD	Suburban	Apartment	Hotel
<b>Pre-tax yield (IRR) (%)</b>									
Range**	10.5 - 12.0	11.3 - 12.5	10.3 - 12.0	10.8 - 12.0	10.8 - 12.0	11.0 - 14.0	10.5 - 14.0	10.5 - 12.0	12.0 - 15.0
Average	11.2	11.8	11.3	11.4	11.4	11.9	11.6	11.1	13.1
<b>Going-in cap rate (%)</b>									
Range**	8.5 - 10.0	9.3 - 10.5	7.5 - 9.5	8.5 - 10.0	8.8 - 10.5	8.8 - 10.0	8.0 - 10.0	8.5 - 9.3	10.0 - 12.0
Average	9.0	9.7	8.5	9.4	9.4	9.6	9.3	8.8	10.4
<b>Terminal cap rate (%)</b>									
Range**	9.0 - 10.0	9.5 - 10.8	7.8 - 10.0	9.3 - 11.0	9.3 - 11.0	9.0 - 11.0	9.0 - 11.0	8.8 - 9.5	10.0 - 13.0
Average	9.5	10.1	9.0	9.8	9.8	10.0	9.8	9.2	11.0
<b>Rental Growth</b>									
Range**	1.0 - 4.5	1.0 - 6.0	1.0 - 4.0	2.0 - 4.0	0.0 - 4.5	1.0 - 4.0	1.0 - 5.0	2.0 - 5.0	3.5 - 4.0
Average	3.4	3.4	3.3	3.5	3.0	3.0	3.4	3.4	3.9
<b>Expense Growth</b>									
Range**	3.0 - 4.0	3.0 - 6.0	3.0 - 4.0	3.0 - 4.0	3.0 - 4.0	3.0 - 4.0	3.0 - 4.0	3.0 - 4.0	3.5 - 4.0
Average	3.5	3.8	3.6	3.7	3.6	3.6	3.5	3.6	3.7

\* The survey was conducted in January, February and March 1996 and reflects expected returns for first quarter 1996 investments.

\*\* Ranges and other data reflect the central tendencies of respondents; high and low responses have generally been eliminated.

Source: Real Estate Research Corporation

Tables 3 through 5 and Exhibit I reflect RERC's most recent survey of institutional investment criteria. Table 3 is used in this section with the balance of the data analyzed in the capital market approach, presented next. Real estate yield expectations increased for all but one property type in the first quarter 1996. As shown in Table 3, reported yield requirements range from 10.5% to 15.0% with property averages ranging from 11.1% to 13.1%. The mean required yield for all property types moved up to 11.5% from 11.4% from the previous quarter.

The largest changes in yield expectations were an increase of 40 basis points for CBD office and 30 basis points for neighborhood/community shopping centers. All other movements were 20 basis points or less. Hotels lead all property types with the highest average yield requirement (13.1%), followed by CBD office (11.9%), industrial R&D (11.8%) and suburban office buildings (11.6%). Neighborhood/community shopping centers and power centers follow with discount rates of 11.4%. Apartments have the lowest discount rate (11.1%), closely followed by industrial warehouses (11.2%), and regional malls (11.3%). As always, we underline that these rates represent unleveraged yield expectations, not realized returns.

Table 3 reflects general underwriting criteria, but discussions with targeted participants suggest that these indications are sometimes reduced if the quality of the property is significantly higher than average. That is not the case for the subject and actually the subject is considered a 'hard sell' in today's real estate market. The overall

discount rates based on inflated dollars range from 10.3% to 12.0% for the retail categories. Given the risk profile of the subject, a discount rate of 11.0% to 12.5% was deemed most appropriate.

### Capital Markets Analysis

Investment in real estate can provide critical diversification for a stock, bond and bill portfolio. However, investment officers must carefully consider all alternatives in order to optimize the risk/return balance. Ten-year U.S. bonds, corporate bonds, real estate debt instruments and stocks are typically used as benchmarks. Since such investments are continuously traded on the open market, interest rate and/or return data for each is readily available. Real estate, however, has different risk characteristics than these alternatives. Investors require an adjustment of their return expectations from real property investments to match the risk differences.

When comparing fixed-income securities—bonds and debt—with real estate, the returns are analyzed on a historical basis to arrive at yield spreads. The estimated spreads then are applied to the respective current fixed-income rate to derive a benchmark real estate discount rate. If the comparison is between stock returns and real estate, an analysis of return volatility, as measured by its standard deviation, provides the risk-adjusted basis for arriving at a real estate discount rate. This type of analysis can also be applied to fixed-income securities.

**TABLE 4**

Intermarket Yield Spreads:  
Real Estate Vis-À-Vis Capital Markets

	1Q 1996	4Q 1995	3Q 1995	4Q 1994	4Q 1993	4Q 1992
Mean real estate yield (%)	11.5	11.4	11.5	11.7	11.7	12.1
<b>Yield Spread (percentage points)*</b>						
Moody's Baa Corporate (%)	3.4	4.0	3.5	2.6	4.0	3.3
Moody's Aaa Corporate (%)	4.1	4.6	4.2	3.2	4.8	4.2
10-Year Treasuries (%)	5.2	5.8	5.2	3.9	5.9	5.3

\* Real estate over other investments.

Source: Real Estate Research Corporation

The following provides a capital market comparison.

Table 4 shows historic spreads between the average targeted yield for real estate and actual yields for alternative investments. The gap between real estate and capital market returns is wide. The current range in spreads is from 520 basis points on 10-year Treasuries to 340 basis points on Moody's Baa Corporate. The gap only serves to underline the relative attractiveness and perceived risk of real estate vis-à-vis other asset classes. A normative spread for a well-positioned real estate asset would be a range of 350 to 450 basis points above equal term bonds. The spread comprises several adjustment components, including management fees above financial instruments. A visual picture is given of our spread analysis in Exhibit I.

Table 5 reflects current yields ranging from 6.3% to 8.1% for alternative investments. Adding a market-derived spread (350-450) for the real estate already discussed, the alternative market analysis indicates a rate range of 9.80% to 12.6% for the well-positioned property. Given the increased risk position of the subject asset, an additional adjustment of 100 basis points was deemed appropriate or a concluded rate of 10.8% to 13.6%.

**TABLE 5**

Real Estate Vis-À-Vis Capital Market Returns\*

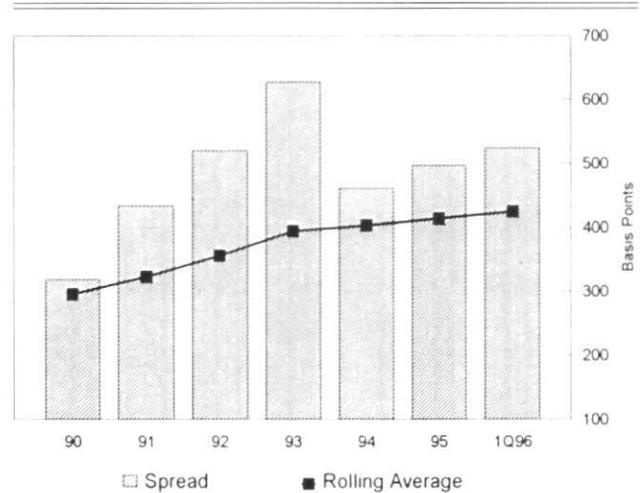
	1Q 1996	4Q 1995	3Q 1995	4Q 1994	4Q 1993	4Q 1992
Real estate yield (%)	11.5	11.4	11.5	11.7	11.7	12.1
Moody's Baa Corporate (%)	8.1	7.4	8.0	9.1	7.7	8.8
Moody's Aaa Corporate (%)	7.4	6.8	7.3	8.5	6.9	7.9
10-Year Treasuries (%)	6.3	5.6	6.3	7.8	5.8	6.8

\* This survey was conducted in January, February and March 1996 and reflects desired returns for First Quarter 1996 investments. Capital markets rates are for the last month of the respective quarter.

Source: Real Estate Research Corporation

**EXHIBIT 1**

Historical Real Estate Yield Spreads  
Over 10-Year Treasuries



Source: RERC, Federal Reserve Data

**Data Conclusion**

The criteria outlined in this article served as the directional foundation for the selection of an appropriate discount rate analysis. Appraisal-based return series do not appear to capture appropriate variability parameters and have to be used carefully, if at all. Given available data, the best foundation for a discount rate is achieved by rigorous analyses of transaction data, investor surveys and alternative investment returns. Given the active data presented in this article, a summary would be as follows.

The discount rate to be applied to the cash flows of the subject property must reflect the quality and durability of the income projections, as well as the likelihood of long-term gain in asset value. As discussed, the yield to the investor (Internal Rate of Return) must be at a level commensurate with alternative investment vehicles.

The most comparable rates, as previously analyzed, include:

Transaction Data	11.5% to 13.0%
Real Estate Indexes	12.0% to 13.0%
Investor Surveys	11.0% to 12.5%
Capital Markets	10.8% to 13.6%

Based on this analysis, a rate of 12% was used to discount the future benefits to a present worth.

All that analysis and still a 12.0% conclusion? This article is intended to convey the importance of developing risk-adjusted returns for real estate and understanding that there is a practical approach to rate analysis. The reader may still wonder why it is necessary to use multiple analyses to reach this discount rate conclusion. The value of this analysis is to exercise a systematic and consistent method



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for deriving an appropriate discount rate and to justify and defend it when challenged.

The foregoing discussion relies ultimately on the analyst's judgment in determining an appropriate discount rate, within a market-established range whether derived from transaction data or other methods. The adjustment for risk is the most difficult judgment to make. The analyst must consider the entire spectrum of physical, financial and sociological factors. Additionally, this discount rate is not mutually exclusive of estimated inflation or variables in the cash flow that create volatility, such as rents, expenses, etc.

Finally, deriving a discount rate relies on historical data, e.g., transaction information. In contrast, the discounted cash flow analysis is a prospective model. In this context, building a discount rate must adjust for historical bias. Applying a consistent framework to the adjustment process often leads to meaningful and consistent discount rates. Though in need of further analysis, it is apparent that the adjustment process should consider the following factors:

1. **Current conditions.** Focus on current returns as the base for building a discount rate. Analyze the current expectations for inflation, real risk-free return, term structure of interest rates, etc.
2. **Distortions in historical returns.** Appraisal biased indexes or write-downs are possible distortions requiring particular attention. Although a longer history of realized returns are now available (approximately 20 years for indexes and more than 25 years for specific funds), this time period may not suffice to filter out unusual cycles unlikely to be repeated in the future.
3. **Current biases.** Other asset types could be relatively overpriced, so that the future might produce a better performance from real estate, the unfavored asset.
4. **Future changes.** What is the impact on the recapitalization of real estate with public money? What risk(s) does technology present to real estate? What does the divestiture of investment in real estate by corporate companies mean to returns?

Incorporating all available data and using sound judgment is the key to deriving a relevant discount rate. We would suggest developing a market finance theory to account for investors who focus more on return characteristics and intuitively measure risk. The author believes that real estate analysts should continue to develop this style of analysis.

**NOTES**

1. Fisher, J., Geltner, D., Webb, R.B., "Value Indices of Commercial Real Estate: A Comparison of Index Construction Method," *Journal of Real Estate Finance and Economics*, 1994, 463-481.
2. Real Estate Research Corporation (RERC), *Real Estate Report*, 1979-1996.



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# THE NINE PERCENT SOLUTION

by Richard B. Gold

Against improving market fundamentals, real estate investors are faced with the paradox of why institutional real estate income returns show such little variation. Capitalization rates do not have the same volatility as market fundamentals, varying only by property type. Holding other factors constant, lower interest rates and higher occupancy levels can act to reduce risk premiums and benefit holders of real assets. However, theory and practice are not always born of the same mother. Cap rate surveys and industry data continue to indicate that real estate returns show little variation over time. When they do stray, capitalization rates are quickly brought back into line by an unknown financial gravitational force.

The article explains how this seemingly steady state is not only possible but can lead to an answer that is always nine percent. In bifurcating the capitalization rate into core and transitory components, this article provides a theoretical explanation of how increases in transitory factors can offset declines in the core cap rate and *vice versa*.<sup>1</sup> Ultimately, it is up to the reader to decide whether the factors that generate this answer hold true today, and more importantly, will hold true tomorrow.

## The Historical Record Revisited

Unlike baseball or even the stock market, real estate has no official statistical abstract. Data on real estate returns are limited because of the private and complex nature of most real estate transactions. Even organizations such as the National Council of Real Estate Investment Fiduciaries (NCREIF) face significant data obstacles. Because NCREIF relies on appraisal-based values, reported income returns are considered biased. Although comprehensive data are available on REITs, dividend returns are not the same as income.<sup>2</sup>

Even if they were, there is ample evidence to suggest that REIT stock prices do not necessarily represent underlying property returns. Factors such as management quality, financial structure and future growth expectations (both internal and external) play a significant role in REIT pricing.

Because of the limitations of industry association data, survey data measuring investor expectations are presented instead. Exhibit I shows the results of survey data provided by Real Estate Research Corporation on expected investor returns during the period mid-1992 through 1995.<sup>3</sup> Despite several years of steady recovery, apartment cap rates have remained within a narrow 40 basis point

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## EXHIBIT I

### Expected Going-In Capitalization Rates By Property Type

	10 Year Treasury	Warehouse	R&D	Regional Malls	Power Centers	Community Centers	CBD Office	Suburban Office	Apartments
92q3	6.6	9.5	10.3	7.7	9.6	9.5	9.6	10.2	8.9
92q4	6.7	9.6	10.0	7.6	9.5	9.5	9.7	10.3	9.1
93q1	6.3	9.7	10.6	7.8	9.8	10.0	9.8	10.4	9.1
93q2	6.0	9.5	10.1	7.7	9.4	9.8	10.3	10.5	8.9
93q3	5.6	9.3	10.0	7.7	9.2	9.6	10.4	10.6	8.8
93q4	5.6	9.4	9.8	7.7	9.6	9.6	10.0	10.1	8.7
94q1	6.1	9.4	10.1	7.6	9.5	9.6	10.0	10.0	8.7
94q2	7.1	9.3	10.4	7.7	9.1	9.7	9.7	9.9	8.7
94q3	7.3	9.3	10.4	7.7	9.3	9.8	9.7	9.9	8.8
94q4	7.8	9.2	10.2	8.0	9.2	9.6	9.8	9.8	8.7
95q1	7.5	9.4	10.1	8.2	9.4	9.7	9.7	9.8	9.0
95q2	6.6	9.2	9.6	7.9	9.4	9.5	9.2	9.2	8.9
95q3	6.3	8.9	9.9	8.0	9.3	9.4	9.4	9.2	8.8
95q4	5.9	9.0	9.6	8.2	9.2	9.2	9.6	9.2	8.8

Source: Real Estate Research Corporation

band during the last three plus years. Regional mall cap rates varied by only 50 basis points during the same period. These numbers seem counter-intuitive given the strength of the apartment sector and the uncertainty surrounding retailing in general and malls specifically. While it is true that Central Business District (CBD) office cap rates increased in 1993, this run-up seems somewhat curious since it lagged the weakened space market by several years. As if on cue, the spike was quickly erased and cap rates fell back to more normal levels. Reinforcing this are data showing that expected returns exhibit less variation across time than the risk-free ten-year treasury rate. Exhibit II illustrates the variance of each series between third quarter 1992 and fourth quarter 1995, and reinforces the stability of investor expectations relative to shifts in interest rates during the past several years.

## EXHIBIT II

### Sector Volatility (1992q3 to 1995q4)

	Variance (Basis Points)
10-Year Treasury	49
Warehouse	5
R&D	9
Regional Malls	4
Power Centers	4
Community Centers	4
CBD Office	10
Suburban Office	22
Apartment	2

Source: Real Estate Research Corporation

All else being equal, one would assume a strong positive correlation between movements in interest rates and expected returns. That is, higher interest rates should lead to higher cap rates as investors ramp up their yield requirements. Contrary to expectations, however, the 10-year Treasury shows little correlation with property-specific cap rates, as reflected in Exhibit III. In fact, movements in 10-year Treasuries are negatively correlated with several property types.

There is some evidence that, unlike interest rates, investors' expectations are influenced by market fundamentals. At a minimum, anecdotal evidence suggests that investors consciously discriminate between markets based on market expectations. Therefore, an office building in a recovering market, such as Boston, currently trades at a lower cap than a similar building in a soft market, such as Hartford, where uncertainty is rampant.

What is the relationship between property types and capitalization rates? In the case of warehouse properties, there is a significant positive correlation. Specifically, for the 14 quarters in which data are available, the correlation coefficient between warehouse cap rates and industrial vacancy rates was approximately .8. A weaker correlation was found between expected office cap rates and both suburban and CBD vacancy rates.<sup>4</sup> While the relationship between cap rates and the space market is more compelling than cap rates and the financial markets, the period in question is rather brief, and it is difficult to draw firm conclusions from such a limited sample. In addition, while market vacancy rates appear to influence cap rates, other explanatory factors also can impact cap rates.

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### EXHIBIT III

#### Cap Rates and Treasuries Show Little Correlation (1992q3 to 1995q4)

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	<u>10-Year Treasury</u>
Warehouse	- 2%
R&D	41%
Regional Malls	27%
Power Centers	- 27%
Community Centers	20%
CBD Office	- 42%
Suburban Office	- 21%
Apartment	7%

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Source: Real Estate Research Corporation

#### When Is A Cap Rate Not A Cap Rate?

Most investors view cap rates as singular. In reality, they comprise two components:

1. A *core* rate which varies by property type and market, ownership and time. The core rate represents the risk-adjusted opportunity cost of owning real estate.
2. A *transitory* rate representing various premiums whose size and sign vary over the course of the real estate cycle.

The combination of the core and transitory rates determine the transactional cap rate. The core rate and the transactional cap rate are equal when the space markets are at or near equilibrium and buyer and seller expectations are aligned. In reality, transactions readily take place because neither buyers nor sellers can extract premiums as both have placed the same value on a building's cash flow.

Premiums exist when buyer and seller expectations differ or when externalities such as tax law or zoning changes occur. In these situations, a difference between the core rate and the transactional cap rate emerges, creating a *transitory* premium. For example, during the late 1980s and early 1990s few transactions were occurring in the marketplace. In a capital scarce environment, buyers were able to command a premium from sellers which drove cap rates higher. During the mid 1980s, the opposite occurred. In a capital-driven environment, real estate was hot and sellers received a premium from buyers in the form of below-core cap rates.

Premiums can emerge during any part of the real estate cycle, for example, from a change in real estate underwriting criteria. Whose numbers and coverage ratios are used will depend on a host of factors, not all of which relate directly to the asset class. In addition, buildings encumbered with long-term leases may command either a positive or negative premium. A positive premium would be

relative to buildings with shorter leases when market conditions have or are expected to deteriorate; a negative premium would be garnered if market fundamentals are on the upswing. The former occurs because of cash flow stability in a weak market, while the latter occurs because the lease duration works to reduce potential cash flow in a market with rapidly escalating rents. Other premiums can occur because of tax law changes. During the early 1980s, cap rates plunged in response to the 1981 Economic Recovery Tax Act (ERTA) which created non-market incentives for real estate owners. Of course, whatever the government gives, the government can take away, and the 1986 tax act did just that. Not surprisingly, cap rates shot up and owners were left holding properties whose values were propped up by benefits that no longer could be transferred to the next owner.

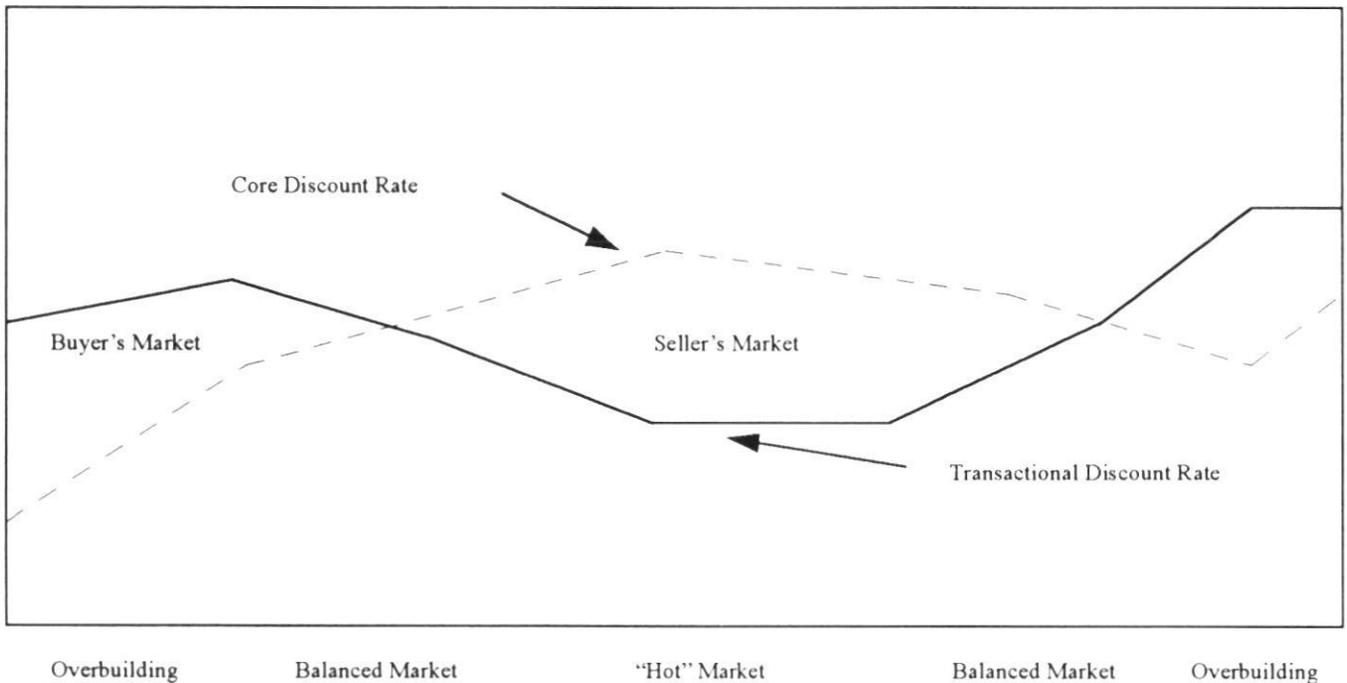
Exhibit IV shows the bifurcation of the transactional cap rate. During periods of overbuilding, the transactional cap rate is higher than the core rate, because buyers are able to extract a positive premium from sellers. This explains why appraised values and transaction prices differed so significantly during the bottom of the last market cycle. Appraisers valued buildings using the core cap rate, while buyers recognized their leverage and used it to their advantage.

As occurred during the late 1970s and early 1980s, premiums shrank and shifted to the seller when the market's appetite improved. During this period, institutional investors were willing to pay a premium for properties, and sellers were able to drive the transactional rate above the core rate. Ultimately, however, the market slows and the gap between the core and transactional cap rates disappears. Since markets rarely stay in equilibrium for an extended period of time, the core and transactional cap rates are constantly engaged in a dance with market forces selecting the tune.

Multiple premiums also can be present at any time. As already pointed out, market conditions are only one of several reasons why the transactional and core cap rates can differ. In addition, the core rate itself is not static. It can trend either up or down depending on a host of events. Changing expectations with respect to inflation and the pricing of alternative assets (stocks, bonds, etc.), can impact the core rate. Therefore, property values can be altered due to transitory changes in the cap rate which have nothing to do with the real estate cycle. Conversely changes in market conditions can affect cap rates but can also be amplified by shifts in non-real estate factors. The presence of multiple premiums helps explain why changes in interest rates and inflation may show little relationship to movements in cap rates.

## EXHIBIT IV

### Capitalization Rates Are Not Singular



#### So What Does All This Mean?

Clearly, the dynamics of cap rates can be quite confusing. For example, it is entirely possible that the core cap rate may shift upward only to be matched by an equally large decline in transitory cap rate premiums. The net result is dynamic stability. Therefore, investors must be selective in their assumptions regarding the nature and direction of cap rate changes. The continual presence of countervailing premiums suggests that variations in cap rates are much more complex than their movement or lack of movement implies. For example; the transactional cap rate can be artificially supported during periods of oversupply if the opportunity cost of holding real estate, as measured by interest rates, declines. Conversely, if bond prices are declining, cap rates may rise even as markets tighten.

None of this makes it easy for appraisers or investors trying to forecast discount factors. In fact, these dynamics help explain away much of the criticism leveled at appraisers during the past few years. When determining the appropriate cap rate, an appraiser must consider both the level and direction of the core rate as well as the net change in various premiums. These premiums may be property type, market or property-specific. It is the combination of the core discount rate and the net change in all premiums which determines the appropriate capitalization rate.

#### Conclusion

Imagine a world in which the core rate and various transitory premiums are inversely correlated. Under this scenario, whenever the core rate changes it is met by an equal but opposite movement in the transitory cap rate. Do such relationships exist? Consider the following. Stronger markets typically are assumed to be forerunners of lower cap rates. However, higher occupancy and rents go hand-in-hand with robust employment and income growth, neither of which brings much comfort to the inflation watchers at the Federal Reserve. Investors, being more realistic than economists, do not hold everything else constant. A nervous Federal Reserve translates into higher interest rates; higher interest rates translate into higher cap rates. These dynamics may explain why the answer is always nine percent.

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#### NOTES

1. See Steppe [1995].
2. By law, REITs are required to return to investors 95% of all taxable income. This is different than private equity owners who have no such requirements.
3. The RERC survey queries investment advisors, bankers, pension funds and other similar investors as to their expected going-in cash-on-cash yield by property type. Therefore, the survey results are not actual returns and investor expectations may or may not be met.
4. Correlation coefficients using lagged vacancy rates as well as year-over-year changes in vacancy rates also were estimated with similar results.

# CAPITALIZATION RATES FOR REGIONAL SHOPPING CENTERS: ANCHOR DEPARTMENT STORES VS. MALL STORES

by William N. Kinnard, Jr., CRE,  
Mary Beth Geckler, John K. Geckler  
and Jake W. DeLottie<sup>1</sup>

In the United States and Canada, regional shopping centers are commonly valued through the use of income capitalization. The widespread use and acceptance of this valuation method indicates that it most nearly represents the thought processes and market behavior of buyers and sellers.<sup>2</sup> Moreover, sufficient quantities of appropriate market data are typically available to allow for supportable use of income capitalization. These required data include: 1. net market rentals (generally expressed as rent per square foot of gross leasable area or GLA), 2. capitalization rates extracted from sales transactions data and/or obtained from published survey services<sup>3</sup>, 3. discount rates or expected Internal Rates of Return derived from sales and from published survey sources,<sup>4</sup> and 4. retail sales per square foot of GLA,<sup>5</sup> when available.

Particularly in valuations of regional shopping centers<sup>6</sup> and their components (anchor department stores and mall stores as a group) for ad valorem real property tax purposes, direct capitalization is most commonly employed.<sup>7</sup> While some authorities argue strongly that discounted cash flow models most nearly represent the thinking and behavior of investor-purchasers of regional shopping centers,<sup>8</sup> direct capitalization, nevertheless, is widely used. The essence of direct capitalization is its disarming, and sometimes misleading, simplicity:<sup>9</sup>

$$V = \frac{I}{R}$$

This model translates to “Value equals first-year or ‘stabilized’ Net Operating Income capitalized at (i.e., divided by) a market-derived Capitalization Rate.”

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### The Use Of Blended Capitalization Rates

Some published materials<sup>10</sup> and numerous appraisals from the past five years do not differentiate among sales of anchor department stores only, sales of the mall stores only as a group and sales of mall stores together with one or more anchor department stores when market-derived capitalization rates are extracted from those sales. Moreover, it is not uncommon for capitalization rates extracted from sales of freestanding "big box" discount department store properties, such as Wal-Mart and K-Mart, to be used for valuing components of regional shopping centers. In effect, the approach is that one rate fits all. Because there is a relative scarcity of sales transactions data available for analysis, the practice of blending overall capitalization rates from sales of dissimilar types of retail space housing dissimilar activities has become fairly widespread. The results however, have led to misleading value estimates.

Since the majority of sales reported and shared among appraisers represent transfers of malls only, the extracted capitalization rates from those transactions tend to dominate the calculation of the blended capitalization rates that are derived from mixtures of market sales transactions data. There is not a study known to be available that separates market-extracted capitalization rates derived from sales of malls only from those derived from sales of anchor department stores.

### Indications Of Differences In Risk

Many authors do not differentiate between anchor department stores and mall stores with respect to perceived risk to the owner of the real estate. This explains why they use the same capitalization rate for valuing a regional shopping center and all its components. Typically, that capitalization rate is derived from sales of malls only, or of malls plus one or more anchors (but *not* from sales of anchor department stores only).<sup>11</sup> Yet, continuing research on market rentals for regional shopping centers in both the U.S. and Canada has demonstrated unequivocally that:

1. Regional shopping center rentals per square foot of GLA decrease as size of space (square feet of GLA) increases, but at a decreasing rate;
2. Rent per square foot of GLA increases as retail sales per square foot of GLA increase, but at a decreasing rate; and
3. Sales per square foot of GLA decrease as size of space increases but at a decreasing rate.<sup>12</sup>

All this suggests that department stores, with much larger sizes but substantially lower sales per square foot of GLA, would be perceived differently by both buyers and sellers.

Indeed, a small but emphatic minority of practitioners claims that anchor department stores should

have a lower capitalization rate because there is *less* risk to the property owner associated with anchor department store tenants. The term of the lease is longer and involves less turnover and risk of frictional vacancy. Moreover, the tenant anchor department store firm is larger and usually part of a regional or national chain with allegedly better credit standing and greater financial strength than mall stores.

We do not know of any evidence which supports the argument for lower capitalization rates for anchor department stores. Rather, in property tax appeal proceedings such claims are presented as logical argument since the conclusions stand to reason. Yet in practice these advocates of lower capitalization rates for anchor department stores continue to use one blended rate for both anchors and mall stores.

Our research suggests a different situation. This article includes the preliminary results of that research.

### Nature Of The Research

Published articles and papers that address shopping center valuation were reviewed with particular reference to the capitalization rate(s) appropriate to such valuation.<sup>13</sup>

Then, utilizing data from every issue of *Dollars & Cents of Shopping Centers* from 1975 through 1995, we compared levels of sales per square foot of GLA and rent per square foot of GLA for anchor department stores and for mall stores as a group. We made these comparisons for both regional and superregional shopping centers in the U.S., primarily because the Urban Land Institute has reported data on this basis since 1975. Those analyses included comparisons of trends in sales per square foot of GLA and rent per square foot of GLA for both categories of store space. The data on which the U.S. analyses were based are presented in Exhibit 1, parts A and B.

Further, we analyzed the risks and consequences to owner-operators of regional shopping centers from losing an anchor department store.<sup>14</sup>

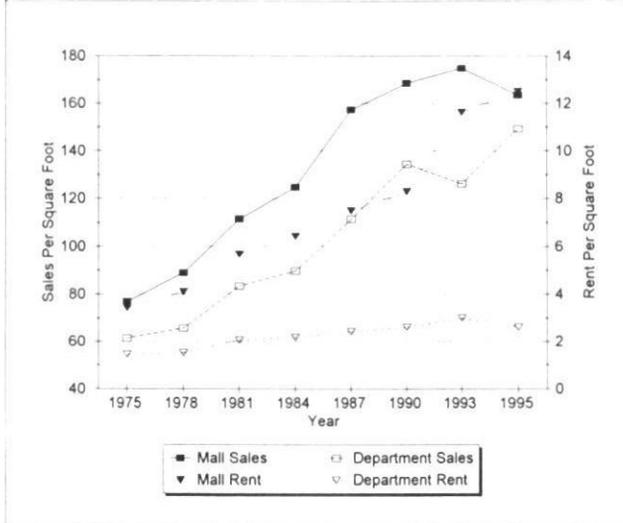
### Risk And Growth Ingredients For Anchor Department Stores

As a result of these investigations, we reaffirmed the obvious but important fact that since anchor department stores occupy larger amounts of space, the consequences of their departure or having their space become vacant are substantially greater for regional or superregional shopping center owner-operators. Moreover, it is not surprising that their rental rates per square foot of GLA tend to be lowest in regional shopping centers, given the findings enumerated above. ULI data also indicate that anchor department stores represent at least as much

## EXHIBIT 1A

Comparison of Sales Per Square Foot of GLA and Rent Per Square Foot of GLA  
Anchor Department Stores Vs. Mall Stores  
U.S. Regional Shopping Centers, 1975-1995

Year	Sales Per Square Foot		Rent Per Square Foot	
	Mall Stores	Department Stores	Mall Stores	Department Stores
1975	76.82	61.42	3.41	1.44
1978	88.91	65.65	4.10	1.51
1981	111.61	83.48	5.68	2.07
1984	124.65	89.77	6.43	2.18
1987	157.32	111.53	7.51	2.42
1990	168.41	134.37	8.29	2.60
1993	174.76	126.15	11.63	3.00
1995	163.54	149.26	12.52	2.61



Source: Dollars & Cents of Shopping Centers

total space as do all mall stores combined in U.S. regional and superregional shopping centers. This is demonstrated clearly in Exhibit 2.

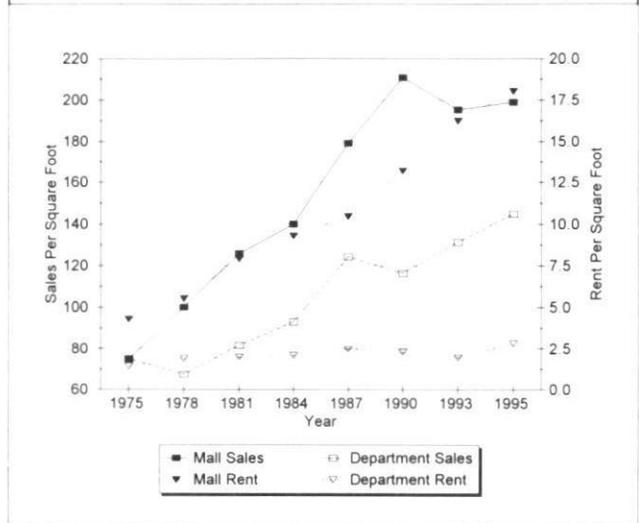
Exhibits 1A and 1B show that sales per square foot of GLA for anchor department stores have not increased as much as sales per square foot of GLA for mall stores among regional and superregional shopping centers in the U.S. Exhibit 1 also indicates that rent per square foot of GLA for anchor department stores has been much lower than rent per square foot for mall stores and has shown dramatically less growth during 1975-1995. Since a capitalization rate (R) may be characterized as a yield rate (discount rate) adjusted downward for anticipated income and value growth over time ( $R = Y - G$ ), it is apparent that the capitalization rate (R) for anchor department stores will be substantially different from the capitalization rate appropriate for mall stores, based on different growth rates.

The consolidation of anchor department store chains, coupled with growing numbers of bankruptcies leading to further consolidations, has had a double-barreled effect on regional shopping centers in recent years. First, some anchor department

## EXHIBIT 1B

Comparison of Sales Per Square Foot of GLA and Rent Per Square Foot of GLA  
Anchor Department Stores Vs. Mall Stores  
U.S. Superregional Shopping Centers, 1975-1995

Year	Sales Per Square Foot		Rent Per Square Foot	
	Mall Stores	Department Stores	Mall Stores	Department Stores
1975	74.83	75.03	4.29	1.42
1978	100.07	67.43	5.51	1.90
1981	125.92	81.79	7.92	2.00
1984	139.97	93.00	9.29	2.09
1987	179.02	124.40	10.46	2.47
1990	210.67	116.37	13.19	2.29
1993	195.19	131.40	16.22	1.95
1995	198.93	144.99	18.02	2.84



Source: Dollars & Cents of Shopping Centers

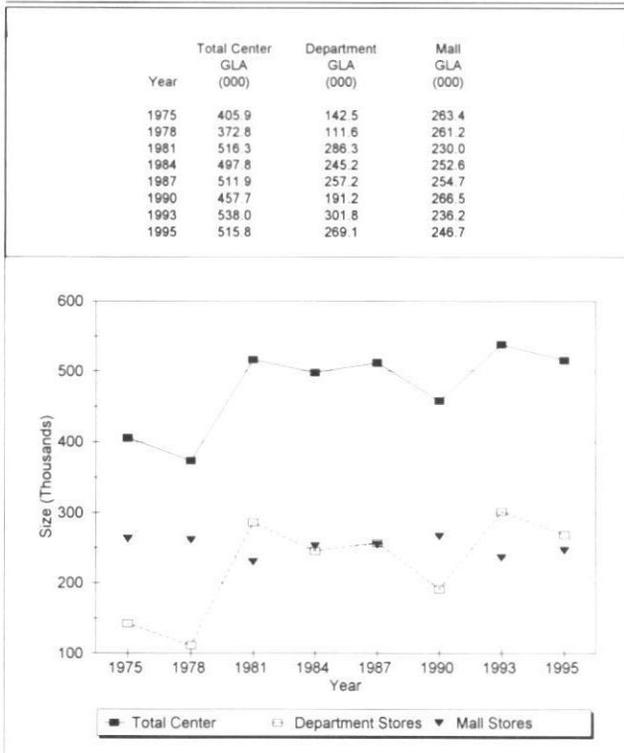
store spaces have been vacated either because of bankruptcy or because consolidating chains have no desire to compete with themselves for the same shopper volume in any given center. Second, that consolidation process means there are fewer replacement alternatives available to regional mall owner-operators for vacated anchor department store space. Subsequently, the loss of a department store anchor tends to be exacerbated by loss of sales volume and ultimately of mall tenants in that part of the shopping center vacated by the anchor department store. Since one of the major functions of an anchor department store in a regional shopping center (acknowledged by authors on both sides of the capitalization rate debate<sup>15</sup>) is to attract shoppers and customers to the shopping center, the loss of an anchor department store invariably means decreased shopper traffic in that portion of the shopping center.<sup>16</sup>

### Research Hypothesis

Given this background of prior research and information, we developed the hypothesis that the capitalization rate for anchor department stores is greater than for mall stores as a group, in regional

## EXHIBIT 2A

Comparison of Total Gross Leasable Area  
Anchor Department Stores Vs. Mall Stores  
U.S. Regional Shopping Centers, 1975-1995



Source: Dollars & Cents of Shopping Centers

shopping centers in the U.S. and Canada. Anchor department stores occupy larger spaces than mall stores. They also produce lower sales per square foot of GLA, lower rent per square foot of GLA, lower growth in sales and rents over time, and greater risk and consequences of loss for the owner of the anchor department store space.

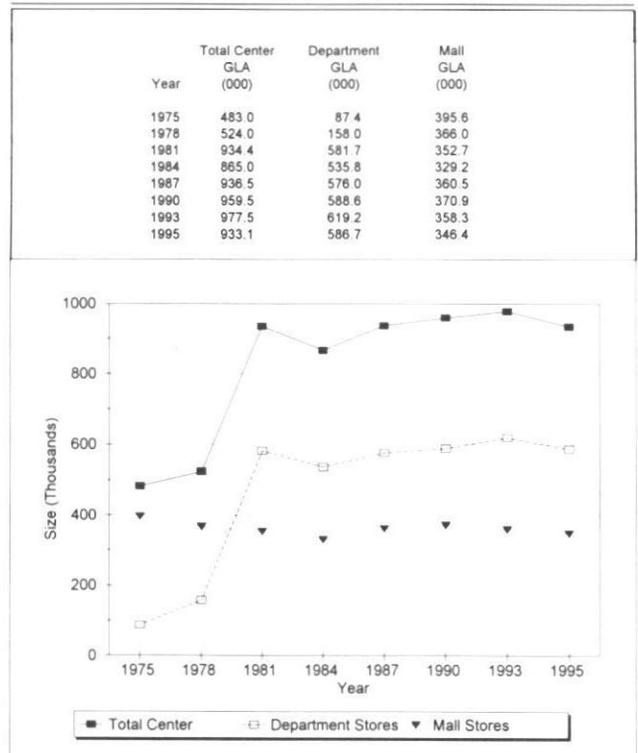
### Data Employed

To test this hypothesis, sales data were assembled from a number of sources. The data obtained for analysis consisted of relatively recent sales of regional shopping center space for which both sales price and net operating income at the time of sale had been obtained. Ultimately sufficient data was obtained to serve as the basis of further analysis on eight sales of anchor department stores only, plus 29 sales of mall stores only and 34 sales of malls with one or more anchor department stores included in the transaction. In the latter group, all but two of the sales included one department store only.

The period included 1988-1995. Some sales occurred in each of the four census regions of the U.S. Data also was obtained showing the year and month of the sales transactions, whether the

## EXHIBIT 2B

Comparison of Total Gross Leasable Area  
Anchor Department Stores Vs. Mall Stores  
U.S. Superregional Shopping Centers, 1975-1995



Source: Dollars & Cents of Shopping Centers

shopping center involved was a superregional or regional center and (in some cases) the year built. Unfortunately, not all of the otherwise usable sales transactions files contained data on the year built (for age at time of sale), so that variable was eliminated from analysis.

### Analytical Procedures Followed

First applied was simple comparisons of averages to distinguish capitalization rates for sales of anchor department stores only from sales of mall store space only, as well as from malls with one or more anchors included in the sales transaction. For this analysis, some 41 sales were included with only spotty information available but with data on sales price and NOI at the time of sale. For informational purposes, these 41 sales are included as part of the category "All Except Anchors Only" in Exhibit 3.

With a database of 71 sales (8 anchor department stores only, 29 malls only, 34 mixed), sparse but nevertheless instructive multiple regression models were developed in the Hedonic Pricing Model format. In this particular instance, the dependent variable used was overall capitalization rate (OAR). We employed two usable models: one that included census region as an independent variable

### EXHIBIT 3

Comparison of Averages  
Capitalization Rates Derived from Sales  
Anchor Department Stores Vs. Malls

	Average (X)	Standard Deviation (s)	Coefficient of Variation (C.V.)	Difference From Anchor (Percentage Points)
Anchor Only (8)	10.48%	0.44%	.0420	0.00
Malls Only (29)	6.62%	0.91%	.1375	3.86
All Verified Except Anchor Only (59)	6.74%	1.00%	.1484	3.74
All Except Anchor Only (100)	6.99%	1.64%	.2346	3.49

and one that did not. The model that included census region as a location variable was Model A; the one that omitted census region as an independent variable was Model B.

Discrete binary year variables (Yes-No) were included to account for varying market conditions over time. Also incorporated were binary variables (Yes-No) for superregional versus regional shopping centers (SUPERREG) and for sales of anchor department stores only versus all other sales (DEPTST). Finally, a variable was included for the size of the square footage sold (GLASOLD). As already noted, too few sales transaction files contained information on year built, so there was no independent variable for age at time of sale. The results obtained from Models A and B are summarized in Exhibit 4, and the implications of those results are discussed in the following section.

The regression models produced satisfactory statistical indicators which strongly suggests that the results are usable and reasonably reliable. Both Models A and B produce Adjusted R<sup>2</sup> in the vicinity of .70. The F-Ratio for each model indicates that the results are highly significant and therefore clearly non-random and non-chance. The standard error adjusted for degrees of freedom is low relative to both the intercept and standard calculated values of the dependent variable.

Several alternative models utilizing natural logarithms for both the dependent variable and GLASOLD were tested, but no improvement in statistical quality was obtained. As a result, the linear form of model was selected, as represented by Models A and B.

#### Findings

Comparison of Averages (Exhibit 3) clearly demonstrates that, when the results of the data subsets are compared, the anticipated overall capitalization rate (OAR) for sales of anchor department stores only is measurably and markedly higher than for sales of

### EXHIBIT 4

Selected Multiple Regression Model Results  
Overall Capitalization Rate is Dependent Variable

	Model A	Model B
Number Sales	71	71
R2 (Adjusted)	.6710	.7160
F-Ratio	10.92	13.52
Standard Error (d.f. Adjusted)	1.00	0.98
Variables	Coefficients	
1991	+ 0.37 (0.83)	+ 0.14 (0.36)
1992	+ 1.17 (2.88)	+ 1.04 (2.68)
1993	+ 1.17 (2.48)	+ 1.12 (2.43)
1994	- 0.28 (0.25)	- 0.20 (0.19)
1995	+ 1.40 (1.34)	+ 1.49 (1.46)
Superregional (Yes - No)	- 0.28 (0.97)	- 0.18 (0.63)
Department Store (Yes - No)	+ 3.69 (6.23)	+ 3.57 (6.21)
Intercept	+ 6.29 (3.30)	+ 6.26 (3.68)

NOTE: Figures in parentheses are calculated *t*-Values.

malls only or for sales of malls that include one or more anchor department stores. Particularly in comparing rates extracted from sales of anchor department stores only with those derived from sales of malls only, the differences are substantial and statistically significant. It is highly unlikely that these are random or chance occurrences.

The regression models indicate there is no benefit derived from including the census region as a location variable. Indeed, coefficients for all census regions were nonsignificant statistically, suggesting that any regional market differences had essentially equal effects on rentals, occupancy and sales prices. Accordingly, the results of Model B were primarily relied on for analyses.

The time variables (binary year) showed an interesting yet unsurprising pattern. The base year of 1989 was selected against which all others would be measured and compared. For 1988 and 1990, the coefficients were negative but nonsignificant. This makes logical sense and is consistent with market evidence for that time period. However, starting in 1991, the year coefficient (reflecting market conditions) is positive. This indicates that higher capitalization rates were required by investors in shopping centers as the effects of overbuilt markets and generally declining economic conditions took hold. These year coefficients increased through 1993, with 1992 and 1993 exhibiting positive, statistically significant coefficients. A brief decline occurred in 1994 with a further (but nonsignificant) increase in capitalization rates for regional shopping center sales in 1995. GLASOLD had a small, almost neutral coefficient. It was highly nonsignificant. As a result, its values are not shown in Exhibit 4.

The coefficient for sales of components of superregional (as opposed to regional) shopping centers was negative, quite small and statistically nonsignificant. This result would be expected because of the relative popularity of superregional centers among investors, as reported in the professional and trade press.

Finally, the coefficient for "Department Store" is positive, relatively large (the largest of any coefficient in the model) and statistically significant. This result indicates that capitalization rates for sales of anchor department stores only are higher than those for sales transactions involving mall stores, whether mall stores only or mall stores in combination with one or more anchor department stores. Both Model A and Model B indicate that this is a systematic market phenomenon. Moreover, the typical (average) differential or premium for a capitalization rate on the sale of anchor department store space is approximately 3.60 percentage points. That figure is quite consistent with the differentials indicated in Exhibit 3, especially the comparison between rates for all verified sales except anchor stores only and for anchor department stores only.

### Conclusion

From this limited sample, it is quite apparent that a strong, systematic market process is at work. Sales of anchor department stores occurred at capitalization rates substantially in excess of those associated with sales of mall stores as a group, whether or not in combination with one or more anchor department stores. These findings have important implications for the valuation of regional (and superregional) shopping centers and their components. They indicate strongly that anchor department store space should be valued separately and differently from mall space. These findings are a direct response to the concerns expressed by Gaylord Wood, Esq. in 1988.<sup>17</sup>

At the same time, the limited number of sales transactions files available for this analysis indicates that more studies using more data are necessary to test whether the findings have broad applicability. The issue is important enough to suggest that similar research efforts be undertaken in the near term future.

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### NOTES

1. The authors wish to give special thanks to those members of the Real Estate Counseling Group of America, Inc. who so generously participated in the data-gathering phase of the research used in this article: David W. Craig, CRE, MAI; Harvey P. Jeffers, CRE, MAI; Maxwell O. Ramsland, CRE, MAI; J. Carl Schultz, CRE, MAI.

2. See Appraisal Institute [2], Butcher, [4,5], Eppli & Shilling [8], Kinnard & Geckler [13], McElveen & Diskin [17], Ramsland [21], and Vernor & Rabianski [25].
3. See Korpacz [15], Real Estate Research Corporation [22].
4. Ibidem.
5. Urban Land Institute, *Dollars & Cents of Shopping Centers*, Washington, DC: Triennially 1969-1993; 1995. See also Kinnard [11] and Kinnard & Geckler [12].
6. Throughout this article, we refer to both regional and super-regional shopping centers as regional. It was not until 1975 that the Urban Land Institute reported separate data on regional and superregional shopping centers. Moreover, ULI still combines regional and superregional centers when reporting on Canadian regionals.
7. See, for example, Grad [9], Martin & Nafe [16], McElveen & Diskin [17], Scribens & Hiller [23], Tessier [24] and Wood [26].
8. See, for example, Benjamin et al [3], Eppli & Shilling [8], Ramsland [21] and Vernor & Rabianski [25].
9. See Kinnard, William N., Jr., "Capitalization Rates Are Not Discount Rates: A Handy Guide to Identifying Misleading Appraisals," publication pending April 1996. This article contains numerous references to other authorities published since 1984.
10. See, for example, Appraisal Institute [2], Eckert (IAAO) [7], McLean [18,19], Scribens & Hiller [23].
11. See, for example, Scribens & Hiller [23], Tessier [24] and Wood [26].
12. See, for example, Kinnard [11], Kinnard & Geckler [12,13], Martin & Nafe [16].
13. In particular, we reviewed Benjamin et al [3], Eppli & Shilling [8], Katz [10], Kinnard [11,14], Kinnard & Geckler [12,13], Ramsey [20] and Ramsland [21].
14. In this process, we studied particularly Benjamin et al [3], Carter [6], Kinnard [14], Kinnard & Geckler [13], McElveen & Diskin [17], McLean [19] and Vernor & Rabianski [25].
15. See, Carter [6], Katz [10], McElveen & Diskin [17], McLean [18,19], Ramsey [20], Tessier [24], Vernor & Rabianski [25] and Wood [26]. See also Gatzloff, Dean H., G. Stacy Sirmans and Barry A. Diskin, "The Effect of Anchor Tenant Loss on Shopping Center Rents". Paper presented at the American Real Estate Society Annual Conference, Santa Barbara, CA, April 1994.
16. See, for example, Carter [6], Katz [10], Martin & Nafe [16] and Ramsland [21].
17. Wood [26].

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# OFFICE CAPITALIZATION RATES: WHY DO THEY VARY ACROSS METROPOLITAN MARKETS?

by Petros S. Sivitanides and  
Rena C. Sivitanidou

## *Acknowledgments*

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**E**xemplifying the relationship between a property's net (operating) income and asset value, the capitalization rate is instrumental in the application of various methodologies for investment analysis. In the context of the direct capitalization approach, a market-extracted (ex-post) capitalization rate is typically applied to a real asset's achievable net income to yield an estimate of its value. In the context of the modern income approach, or discounted cash flow (DCF) methodology, the prevailing capitalization rate is often employed as a benchmark to yield a terminal capitalization rate, which, in turn, is used to derive a property's likely resale price and investment value.<sup>1</sup>

Given their widespread use in investment analysis methodologies, capitalization rates have been the focus of a growing body of empirical work. A first segment of this literature encompasses studies that have shed considerable light on the role capital markets and public policy variables (e.g., the stock earnings-price ratio, mortgage rates, expected inflation and changes in the tax code) have played in driving intertemporal movements in capitalization rates.<sup>2</sup> A second segment of the relevant literature involves studies that have explored the extent of those rates' cross-section variations. For example, several studies have examined variations in capitalization rates across broad property types and concluded that averaging these rates eliminates important information.<sup>3</sup> A few other studies have also attempted to explore *spatial* differentials in capitalization rates but, being limited in scope, they have only examined the extent of such differences across either broadly-defined regions or submarkets within given metropolitan areas. Moreover, such studies present limited attempts, if any, to unveil specific factors that may be responsible for shaping observed spatial variations in capitalization rates.<sup>4</sup>

A clear omission, then, in this cross-section research involves a question that is especially pertinent to institutional investors with geographically diversified holdings. This question entails the extent to which capitalization rates vary across metropolitan markets and, most importantly, the specific factors underlying such variations. The widely recognized segmentation of real estate markets along metropolitan boundaries renders such questions meaningful and important to address.

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Given the paucity of relevant research, this article is intended to shed light on the underlying determinants of intermetropolitan differentials in capitalization rates. Recognizing the existence of nontrivial variations across property types in such rates, this analysis focuses only on the case of cross-section differences in office capitalization rates. The second section of the paper develops a modeling framework for identifying metropolitan-specific factors which determine intermetropolitan differentials in office capitalization rates. Section three discusses the data and variable proxies employed in the empirical analysis, and the fourth section presents the empirical model used to test the effects of such variables and provides the empirical results. The concluding section summarizes the findings of the study, places them into a broader context and discusses potential avenues for future research.

### A Simple Model Of Income And Asset Value

In defining a framework to explore the underlying determinants of interarea differences in office capitalization rates, a simple adjustment model is considered. This model builds on two fundamental premises. First, at any given point in time  $t$ , each metropolitan asset market is characterized by an implicit equilibrium capitalization rate,  $C_{jt}^e$ , that reflects the marginal investor's minimum required rate of return. Second, in light of inefficiencies in the real estate asset and space markets, capitalization rates tend to slowly adjust to those equilibrium values dictated by new market realities. As such, capitalization rates prevailing at any point in time may deviate from their equilibrium level. Given such a partial adjustment process, the relationship between  $C_{jt}$  and  $C_{jt}^e$  is described by (1), where  $\delta$  denotes the speed by which  $C_{jt}$  adjusts toward  $C_{jt}^e$ .<sup>5</sup>

$$\ln C_{jt} = \delta \ln C_{jt}^e + (1 - \delta) \ln C_{j,t-1} \quad (1)$$

The identification, then, of the determinants of the prevailing capitalization rate requires modeling the determinants of the equilibrium capitalization rate,  $C_{jt}^e$ . Outlined in (2)-(5), such a model synthesizes the direct income capitalization and the DCF approaches as they pertain to an average property within a given metropolitan area  $j$ . Note that this model does not explicitly account for potential debt financing and taxes, as relevant data are not available for the individual transactions in each metropolitan area's sample.<sup>6</sup>

$$C_{jt}^e = Y_{jt} / P_{jt}^e; P_{jt}^e = V_{jt}^e \quad (2)$$

$$V_{jt}^e = \sum_{n=1}^T \left[ \frac{CF_{jt}}{(1 + d_{jt})^n} \right] + \frac{SP_{jT}}{(1 + d_{jt})^T} \quad (3)$$

$$CF_{jt} = \beta Y_{jt}; SP_{jT} = Y_{jT} [(1 + g_{jt})^{T+1}] / C_{jT} \quad (4)$$

$$C_{jT} = C_{jt}^e + r_{jt} \quad (5)$$

Following the typical income capitalization model, Equation (2) defines the equilibrium capitalization rate,  $C_{jt}^e$ , as the ratio of the net operating income (NOI),  $Y_{jt}$ , over the equilibrium transactions price,  $P_{jt}^e$ . As shown, the latter must equal that investment value,  $V_{jt}^e$ , reflecting the marginal investor's minimum required rate of return, or discount rate,  $d_{jt}$ . Equations (3)-(5) exemplify the conventional DCF model typically used by institutional investors in estimating investment value,  $V_{jt}^e$ . As shown by (3), the latter is the sum of two components. The first component is the present value of annual cash flows,  $CF_{jt}$ , expected to be realized during the holding period of  $T$  years; as shown in (4),  $CF_{jt}$  is assumed to be a constant percentage,  $\beta$ , of net operating income,  $Y_{jt}$ , which is, in turn, is assumed to grow annually at a constant rate,  $g_{jt}$ .

The second component is the present value of the property's resale price,  $SP_{jT}$  at  $T$ ; as shown in (4),  $SP_{jT}$  is estimated as the ratio of net operating income at time  $T+1$  over a terminal capitalization rate,  $C_{jT}$ . Lastly, as indicated by (5), the latter is typically derived from the prevailing capitalization rate (which in *this* equilibrium formulation equals  $C_{jt}^e$ ) by adding a premium,  $r_{jt}$ , that reflects the riskiness of future cash flows.

Incorporating (3)-(5) in (2) yields (6). Solving (6) for  $C_{jt}^e$  yields (7), expressing the equilibrium capitalization rate in terms of three sets of exogenous determinants: the discount rate  $d_{jt}$ ; the expected rate of growth of net income,  $g_{jt}$ , and the risk adjustment associated with the terminal capitalization rate. Lastly, incorporating (7) into (1) yields (8), the empirical formulation of the prevailing capitalization rate.

$$C_{jt}^e = \frac{Y_{jt}}{\beta Y_{jt} \left[ \sum_{n=1}^T \left[ \frac{(1 + g_{jt})^n}{(1 + d_{jt})^n} \right] + \frac{(1 + g_{jt})^{T+1}}{(C_{jt}^e + r_{jt})(1 + d_{jt})^T} \right]} \quad (6)$$

$$C_{jt}^e = c[d_{jt}, r_{jt}, g_{jt}] \quad (7)$$

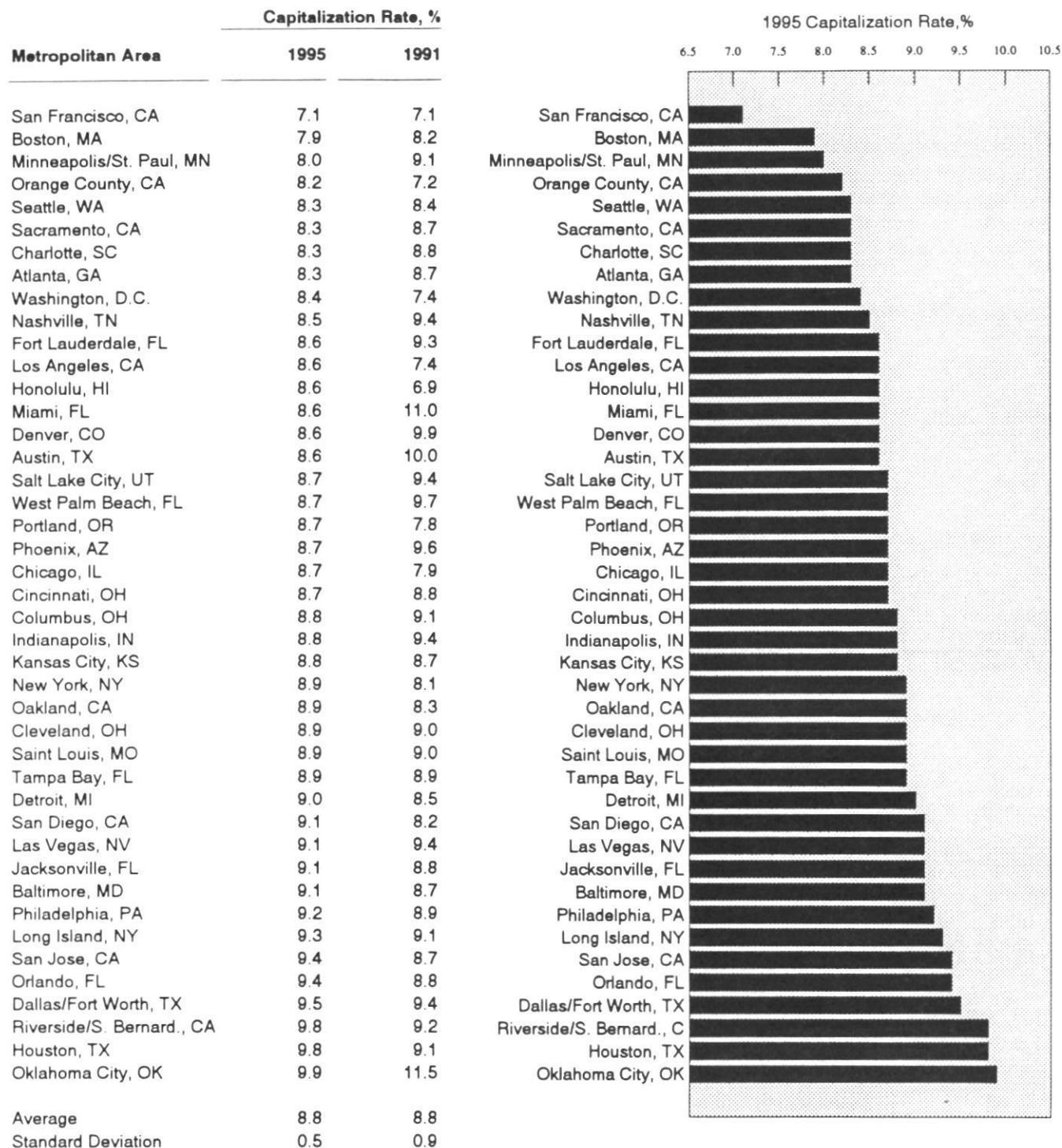
$$\ln C_{jt} = \delta \ln C_{jt}^e(d_{jt}, r_{jt}, g_{jt}) + (1 - \delta) \ln C_{j,t-1} \quad (8)$$

### The Data And Variable Proxies

The empirical formulation in (8) sets the platform for the empirical analysis of cross-section variations in capitalization rates. What follows is a discussion of the market-extracted capitalization rates used in this analysis and the alternative empirical proxies developed for the three sets of explanatory variables embedded in (8).

**FIGURE 1**

Average Metropolitan Capitalization Rates



Source: The National Real Estate Index (a Koll publication)

### Capitalization Rates, $C_j$

Market-extracted capitalization rates for each of 43 metropolitan markets were obtained from the National Real Estate Index (a Koll publication). These metropolitan-wide capitalization rates reflect averages of transaction-specific ratios of actual NOI over the transaction price.

Although this analysis places emphasis on cross-section variations in the 1995 capitalization rates, for comparison purposes spatial variations in the 1991 capitalization rates are also examined. Referring to the fourth quarter of 1995 and 1991, these capitalization rates are portrayed in Figure 1. As seen from this figure, the 1995 estimates range from 7.1% in San Francisco to 9.9% in Oklahoma City; their mean and standard deviation are estimated at 8.8% and 0.5, respectively. Exhibiting a somewhat greater variability, the 1991 estimates range from 6.9% in Honolulu to 11.5% in Oklahoma City; their mean and standard deviation are estimated at 8.8% and 0.9, respectively. Although variations in neither 1995 nor 1991 are enormous, they are sufficiently large to induce substantial differences in investment value estimates.<sup>7</sup> A closer look, then, into their interarea determinants is warranted.

### Variable Proxies

Appropriate proxies are discussed now for the three sets of determinants for capitalization rate variations across markets, including the discount rate, risk premium associated with the terminal capitalization rate and income growth expectations.

*Discount rate (d).* The conventional components of the discount rate include the real opportunity cost of investment capital, usually proxied by the riskless T-bill rate; expected inflation, often reflected in the difference between the short-and long-term T-bill rates; and several investment risk premiums. Given a nationally integrated capital market, only investment risk premiums are expected to vary across metropolitan areas. Thus, for the purpose of this cross-section analysis, only proxies for these premiums are developed.

Four such proxies, presumably shaping investor risk perceptions across metropolitan office markets, can be identified. The *first* involves the softness of the space market as reflected, for example, in the prevailing vacancy rate; the higher this rate, the higher the risk that rent growth forecasts will not be realized. The *second* encompasses the perceived construction risk or the tendency of the market to become oversupplied. This can be proxied by the completions rate, computed as the ratio of completions over the existing stock. The *third* includes the

size of the office market as measured by the total inventory of office space or total office employment; smaller markets have not traditionally been favored by institutional investors and, as such, may be considered as having a higher liquidity risk. Lastly, the *fourth* involves the perceived volatility of a metropolitan economy that can be proxied by variables measuring the variability of historic metropolitan growth rates, the diversity of industrial structure or the sensitivity of the metropolitan economy to national influences.<sup>8</sup>

*Risk premium associated with derivation of terminal capitalization rate (r).* As already mentioned, the terminal capitalization rate used for the derivation of the sales price at the end of the holding period is calculated by adjusting current, market-extracted capitalization rates for the perceived riskiness of the income stream. Such riskiness is accounted for by the factors already discussed.

*Expected income growth (g).* The cash flow of a property is driven by its NOI which is, in turn, determined by rental rates. Therefore, expectations for cash flow growth are determined by expectations for rental growth. As such, the latter can be proxied by one or more of the following influential office market variables: changes in office rents, vacancy rates and total or office employment, as well as completion or absorption rates. Vacancy rate levels may also affect income growth expectations as markets with lower vacancy rates may be considered more likely to experience rent increases. Which of these variables best capture investor expectations for rental growth is an empirical question that can only be resolved through the estimation of (8).

### The Empirical Model

The database used for the empirical analysis includes the capitalization rate data already discussed along with data on several office market variables obtained from CB Commercial, Torto Wheaton Research. The detailed empirical model specification was formulated after an extensive experimentation with a number of alternative definitions and lag structures of the variable proxies just discussed. The chosen specification of these proxies, the respective explanatory variable group they may represent, and their expected effects on capitalization rates are summarized in Table 1. Shown in (9), the empirical model incorporating these proxies assumes a log-log functional form proxying the nonlinearities embedded in (1) and (6). Note that under such a functional form both the dependent and all independent variables that do not assume negative values are in logarithmic form.

$$\ln CAP = b_0 + b_1 \ln LCAP + b_2 \ln STOCK + b_3 \ln COMP + b_4 ABS + b_5 \ln VAC + b_6 \ln GVOL \quad (9)$$

where:

- LCAP* : Lagged Capitalization Rate (lag = 6 quarters)  
*STOCK* : Lagged Office Stock (lag = 2 quarters)  
*COMP* : Lagged Completions Rate = Completions/Stock (lag = 4 quarters)  
*ABS* : Lagged Absorption Rate or Absorption/Stock (lag = 4 quarters)  
*VAC* : Lagged Vacancy Rate (lag = 2 quarters)  
*GVOL* : Growth Volatility, estimated as the standard deviation of metropolitan employment growth rate during the preceding 5 years

### Estimation Results

Table 2 presents the estimation results of (9), applied to both the 1995 and 1991 capitalization rates. The discussion first focuses on the 1995 estimates. Two useful insights are gained from the inspection of the estimation results:

- (i) Differences in market conditions play an important role in shaping intermetropolitan variations in office capitalization rates.

**TABLE 1**

Variable Proxies and Expected Effects on Capitalization Rates

Variable	Proxy for	Expected Effect on Capitalization Rate
Vacancy Rate, <i>VAC</i>	Risk Premium, Income Growth Expectations	Positive Positive
Lagged Completions Rate, <i>COMP</i>	Risk Premium, Income Growth Expectations	Positive Positive
Lagged Absorption Rate, <i>ABS</i>	Income Growth Expectations	Negative
Office Market Size, <i>STOCK</i>	Risk Premium	Negative
Job Growth Volatility, <i>GVOL</i>	Risk Premium	Positive

This conclusion is reflected in the solid performance of critical office market variables such as the vacancy rate, *VAC*, the completions rate, *COMP*, the absorption rate, *ABS*, and the size of the office market, *STOCK*. In particular, the significant positive signs of the marketwide vacancy rate, *VAC*, and the lagged completions rate, *COMP*, most likely indicate that investors require a risk premium or adjust downwards their income growth expectations when investing in markets with higher vacancy or completion rates. Similarly, the significant negative effect of lagged absorption, *ABS*, may mirror the upward adjustments in investor income growth expectations in office markets with higher absorption rates. The negative effect of office space inventory, *STOCK*, is consistent with the argument that real estate investors place a risk premium when investing in properties located in smaller cities. Lastly, the interest of real estate investors in markets that are more stable than others is signified by the statistical significance of *GVOL*, whose positive sign may reflect the risk premium investors require when buying assets in volatile markets.

- (ii) On average, office capitalization rates appear not to adjust rapidly in response to changes in metropolitan office market conditions.

Such a conclusion is bolstered by the significance and magnitude of the coefficient of the lagged capitalization rate, *LCAP*. Estimated as one minus this coefficient, the average adjustment speed embedded in these empirical results is well below unity, the value that signifies an instantaneous adjustment process.<sup>9</sup>

### The Empirical Results Using The 1991 Capitalization Rate

By and large, conclusions similar to those just advanced can be reached through the inspection of the estimation results pertaining to the 1991 capitalization rates. Yet some variables appear to exert weaker effects than those uncovered by the results pertaining to the 1995 capitalization rates. As shown in Table 2, the effect of *GVOL*, capturing growth volatility, and *COMP*, measuring the lagged completions rate, appear to be statistically insignificant predictors of the 1991 capitalization rate. As such insignificance cannot be attributed to collinearity effects, a plausible explanation may lie in recessionary forces that might have put additional strains on already oversupplied office markets in 1991. In light of such dismal market conditions, it is quite likely that the past completions rate and the historic volatility of the economy alike became less relevant as risk measures.

### Conclusion

This article lends credence to the argument that interarea differentials in office capitalization rates *do exist*, thereby suggesting that institutional investors

TABLE 2\*

Estimation Results  
Dependent Variable: Natural Logarithm of the  
Capitalization Rates

Independent Variables <sup>c</sup>	Parameter Estimates <sup>b</sup>	
	1995	1991
VAC	0.0767 (3.32)	0.0876 (3.20)
COMP	0.0051 (1.75)	0.0036 (0.69)
ABS	-0.8362 (-2.46)	-0.6544 (-2.13)
STOCK	-0.0129 (-1.98)	-0.0260 (-2.80)
GVOL	0.0111 (1.60)	0.0031 (0.28)
LCAP	0.6507 (6.86)	0.6022 (7.87)
CONSTANT	-3.536 (-14.04)	-3.2586 (-12.84)
Number of Observations	43	43
R-Squared	0.75	0.85
Adjusted R-Squared	0.71	0.83

<sup>a</sup> The results presented here are based on OLS  
(Ordinary Least Squares)

<sup>b</sup> T-statistics in parenthesis below the coefficients

<sup>c</sup> All independent variables but ABS are expressed in  
natural logarithms

account for such variations when valuing diversified real estate holdings across metropolitan office markets.

The empirical findings suggest that such variations are largely determined by differences in critical office market variables that presumably shape investor income growth expectations and risk perceptions. Such variables include the vacancy rate, completions rate, absorption rate, the size of the market and the historic volatility of the metropolitan economy. Lastly, the estimation results are consistent with the assertion that, on average, capitalization rates do not respond very rapidly to changing market conditions.

The comparison between the 1995 and 1991 estimation results suggests that real estate cycles may also influence the effect of the factors just discussed. Thus, future analysis of such rates should explore the significance of cyclical real estate movements and the relative importance of the time-varying and cross-section effects of these factors. Such analysis will hopefully provide additional insights into the underlying determinants of capitalization rates and, perhaps, shed more light on

the partial adjustment processes that seem to underlie movements in such rates.

## NOTES

1. The DCF model undeniably represents the valuation approach most commonly used by the institutional real estate investment community. The thinness of the commercial real estate market, signified by the small number of transactions (due to few bids to buy or offers to sell), the illiquidity of commercial real estate assets, as well as the lack of readily available information on market prices clearly render such approach preferable over traditional market or sales comparison methodologies. See Gibbons, James: "What to Do About Capitalization," *The Appraisal Journal*, October 1986, pp. 618-623.
2. See Ambrose, Brent and Hugh Nourse: "Factors Influencing Capitalization Rates," *Journal of Real Estate Research*, Volume 8, Number 2, Spring 1993, pp. 221-237; Evans, Richard: "A Transfer Function Analysis of Capitalization Rates," *Journal of Real Estate Research*, Volume 5, Number 3, Fall 1990, pp. 371-379; Froland, Charles: "What Determines Cap Rates in Real Estate," *Journal of Portfolio Management*, Number 13, 1987, pp. 77-83; Nourse, Hugh: "The 'Cap Rate', 1966-1984: A Test of the Impact of Income Tax Changes on Income Property," *Land Economics*, Volume 63, Number 2, 1987, pp. 147-152; Fisher, Jeffrey, George Lentz and Jerrold Lentz: "Tax Incentives for Investment in Non-Residential Real Estate," *National Tax Journal*, Volume XXXVII, Number 1, March 1984, pp. 69-87.
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4. Sirmans, C.F., Stacy Sirmans and Ben Beasley: "Income Property Valuation and the Use of Market Extracted Overall Capitalization Rates," *The Real Estate Appraiser and Analyst*, Summer 1986, pp. 64-68; Saderion, Zahra, Barton Smith and Charles Smith: "An Integrated Approach to the Evaluation of Commercial Real Estate," *Journal of Real Estate Research*, Volume 9, Number 2, Spring 1994, pp. 151-167; Grissom, T., D. Hartzell, and C. Liu: "An Approach to Industrial Real Estate Market Segmentation and Valuation Using the Arbitrage Pricing Paradigm," *AREUEA Journal*, Volume 15, Number 3, 1987, pp. 199-219; Hartzell, D., J. Hekman, and M. Miles: "Diversification Categories in Investment Real Estate," *AREUEA Journal*, Volume 15, Number 2, 1987, pp. 98-109.
5. A similar notion has been advanced in the analysis of rates of returns. See Dokko, Y., R. H. Edelstein, M. Pomer, and E.S. Urdang: "Determinants of the Rate of Return for Nonresidential Real Estate: Inflation Expectations and Market Adjustment Lags," *AREUEA Journal*, Volume 19, Number 1, 1991, pp. 52-69. Also see Pindyck Robert and Daniel Rubinfeld, *Econometric Models and Economic Forecasts* (New York: McGraw-Hill, Inc., 1991), pp. 208-209.
6. The band of investment approach should be used for the calculation of ex-post capitalization rates derived from transactions that involve debt financing. For more information on this approach see Ambrose, Brent and Hugh Nourse: "Factors Influencing Capitalization Rates," *Journal of Real Estate Research*, Volume 8, Number 2, Spring 1993, pp. 221-237; Nourse, Hugh: "The 'Cap Rate', 1966-1984: A Test of the Impact of Income Tax Changes on Income Property," *Land Economics*, Volume 63, Number 2, 1987, pp. 147-152; and Webb, James and C. F. Sirmans, "Yields and Risk Measures for Real Estate, 1966-1977," *Journal of Portfolio Management*, Volume 7, Number 1, 1988, pp. 14-19.
7. See Brueggeman, William and Jeffrey Fisher, *Real Estate Finance and Investments* (Boston, MA: Irwin, 1993), p. 441.
8. Such measures were obtained from Regional Financial Associates, *Precis: Metro Edition* (West Chester, PA: Regional Financial Associates, 1996) Volumes 2 and 3.
9. Given (1), an adjustment speed that takes the value of 1 signifies an instantaneous adjustment to new market conditions. In contrast, an adjustment speed close to zero signifies an extremely slow adjustment process. Given the cross-sectional nature of this analysis, the estimated adjustment coefficients are "average". Differences in speeds of adjustments across metropolitan markets can only be discerned through time series analysis.

# FACTORY OUTLET CENTERS: PUBLIC VS. PRIVATE PRICING

by Howard C. Gelbtuch, CRE

From the late 1980s until just recently, the regional mall was the most preferred property type for direct investment. The change occurred because most consumer preferences shifted from mall-driven conspicuous consumption of designer jeans and the like, to more value-oriented shopping. When retailers and shopping center developers realized that it was more fashionable to buy goods at bargain prices than to flaunt one's wealth, various value-oriented formats evolved such as

- **Factory outlet stores**, owned and operated by manufacturers, sell directly to the consumer and eliminate interim markups in pricing. Among the manufacturers choosing this route are Van Heusen, Levi Strauss & Co., Nike and London Fog.
- **Catalog outlets**, retail stores operated by the major catalog merchandisers such as Lands' End and L.L. Bean, offer discounts from standard pricing.
- **Specialty outlet stores**, operated by the specialty chains, are increasingly found in outlet shopping centers—neighborhood or community sized—centers tenanted exclusively with value-oriented stores. These centers frequently include Nine West, Ann Taylor, VF Corp., Levi Strauss & Co. and Nike.

The number of factory outlet centers in the U.S. nearly tripled between 1988 and 1994, from 108 to 311. Their meteoric growth coincided with an early 1990's structural change in traditional large investor attitudes toward direct investment in real estate. Mortgage loan portfolios at commercial banks were coming under increasing regulatory scrutiny as foreclosures increased; excessive imprudent lending by many savings and loan associations lead to their eventual insolvency or demise; and insurance companies faced intense examination by both rating agencies and state regulatory authorities. In addition, many tax-oriented limited partnerships became increasingly insolvent because of the confluence of the Tax Reform Act of 1986, a weak economy and severe overbuilding. Also, corporations came under pressure from stockholders to better deploy their capital, including funds tied up in real estate, and foreign investors became disenchanted with the performance of their U.S. real estate acquisitions. Lastly, pension fund investors began to question the wisdom of real estate investment as their expectations for real estate liquidity and theoretical performance evaporated. The result was a shedding of real estate assets and, more important, a shortage of traditional

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private sector capital available for direct investment in real estate.

### **Public Vs. Private Investor Attitudes**

With private investors rethinking their real estate asset allocations, the time was ripe to tap the public markets for capital. Public equity markets traditionally had been frowned upon by real estate developers because of the abundance of institutional capital available in private market transactions, the perceived higher cost of public capital, the nuisance of dealing with numerous individual (rather than institutional) investors and the risk of losing privacy and control.

The negative change in institutional attitudes toward real estate also coincided with an increasingly positive attitude by smaller investors. Individuals were attracted to the enhanced liquidity available through the stock market compared to private ownership of real estate. They were encouraged by a small but growing precedent of publicly-held real estate companies, e.g., Rouse, Federal Realty Investment Trust and Weingarten Realty Investors. The transition from private to public ownership was further facilitated by the increasing number of institutional managers focusing on real estate, including Fidelity Investments and Cohen & Steers Capital Management Inc. With a lack of institutional financing, the surge in factory outlet centers was financed largely with the sale stock in new, publicly-traded companies such as Chelsea GCA Properties, HGI Realty, Tanger Factory Outlet Centers and Factory Stores of America.

### *Location, Location, Location*

Most outlet centers are situated away from large metropolitan areas in order not to compete with the manufacturer's larger customer base at department stores and mass merchandisers. While the public became enamored with the concept of outlet shopping, many direct real estate investors have resisted because of store locations in small towns like Boaz, Alabama; North Bend, Washington; or Mineral Wells, Texas. While these may be pleasant places to live, institutions that invest directly in real estate through mortgages or equity typically prefer the larger, more dominant neighboring cities such as Huntsville, Seattle and Fort Worth where replacement tenants are easier to find if the outlet concept fails. Many outlet center companies compensate for a small local populace by locating properties in tourist-dominated cities such as Branson, Missouri; Lake George, New York; and Conway, New Hampshire. Mortgage financing in small towns often is available from locally based banks or thrifts.

However, not all factory outlet center REITs include poorly located real estate. Woodbury Commons, north of New York City and operated by Chelsea GCA Realty, is among the most successful

outlet center in the country because of its outstanding highway access and relative proximity to the New York metropolitan area. Similarly, the Secaucus area of New Jersey and many tourist-dominated towns of New England draw large crowds of shoppers because of their outlet centers. Although many direct real estate investors are unwilling to invest in traditional outlet center locations, the public's favorable response to the concept is largely responsible for the infusion of funds into outlet center companies.

### **The Arbitrage Opportunity**

From a company perspective, current dividend yields of about 8 percent on many factory outlet stocks are favorable since they are far less than the capitalization rates the property would command if sold individually in the open market. (A capitalization rate which is derived by dividing a property's income over its value, is akin to a dividend rate. However, a REIT does not pay all of its cash flow as dividends to investors.) The demand for higher cap rates is primarily a function of the location and the limited re-use potential of most outlet centers. The lower dividend rate accorded the factory outlet shares indicates that investors are willing to pay a premium (accept a lower return) for the increased liquidity available through stock ownership, as well as for professional management.

This disparity in pricing has resulted in owners of outlet center companies seeking public rather than private financing, even if the latter is more available, since it is far less expensive to offer stock with an 8 percent dividend than to sell or finance an outlet center based upon a capitalization rate several hundred basis points higher. This is true even after adding the costs of going public.

For the investor, this has led to interesting opportunities in investment arbitrage. For example, The Mills Corporation's value-oriented, super regional malls often house 15 to 20 anchor stores, such as Bed, Bath & Beyond, Filene's Basement and Marshall's, along with up to 200 smaller stores. These have become destinations unto themselves. Yet the dividend yield on The Mills Corporation stock is currently about 10.5%, probably less than the capitalization rate otherwise assigned to its properties by real estate buyers and sellers. Therefore, sophisticated investors can arbitrage investments in REITs with direct real estate investments by analyzing each risk/reward ratio. If the dividend rate on a given stock exceeds the capitalization rate for a similar alternative real estate investment, the stock should be purchased.

Reflective of real estate markets overall, REITs trailed the admittedly sizzling performance of the Dow Jones Industrial Average in 1995; the NAREIT Equity Index was up 15.3 percent last year

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TABLE 1

Price Performance Of REITs During 1995

Sector	1995 Price Change
Office	24.8%
Hotel	17.6%
Industrial	12.8%
Apartment	4.0%
Regional Malls	( 6.8%)
Shopping Centers	( 8.6%)
Factory Outlets	(10.2%)

Source: 1996-Annual Review and Outlook For REITs, Lehman Brothers

compared to 37.6 percent for the S&P 500. Shopping center stocks generally did not perform as well and outlet center REITs were even worse.

Based upon the performance of outlet center stocks through 1995, direct real estate investors have proven themselves to be more astute than the public by steering clear of real estate that is locationally challenged. It is uncertain whether this was a conscious decision to avoid outlet centers, due to other perceived opportunities for better capital deployment, or because of a general aversion to real estate. Perhaps time will prove that factory outlet companies, at their current pricing, are an attractive investment. If so, it will not be because the quality of their underlying real estate is high.

### Looking Forward

The stock market is usually an excellent prognosticator of returns as shown in Table 1. Many Wall Street brokerage firms are projecting an overall return of 15 percent from REITs in 1996. As this is based on the sum of both an annual dividend and expected price appreciation, it is similar to an IRR in real estate parlance. Investors who concur with this scenario but cannot buy real estate directly at a 15 percent IRR may be better off investing in REITs. Within the REIT universe, some stocks are expected to outperform the average (office companies for example) while others with shopping centers are expected to underperform. Counter-cyclical investors, or those with the capacity to add value to their acquisitions, may continue to prefer investing in real estate. REITs themselves also will begin to arbitrage capital costs by taking advantage of the current low interest rate environment to borrow money for acquisitions.

As the REIT market continues to expand, real estate counselors will need to reconcile real estate terminology with that used by stock analysts and to recognize that stocks and real estate compete with each other for capital. The distinction between owning bricks and mortar and share certificates is blurring, and real estate counselors who want to remain on the leading edge of their profession have to speak both languages.

# A SIMPLIFIED APPROACH TO UNDERSTANDING CAPITALIZATION RATES

by Young W. Chai

The criticism that today's properties are valued based on yesterday's prices reflects a traditional process which estimates the market value of an asset by analyzing prior and current comparable sales. While the approach inherently produces a time lag and smoothing, this article argues that these may be the result of insensitivity to real estate market conditions which, in turn, affect expectations for future income growth.

## Valuation Of Real Estate Investments

There are two generally accepted approaches to value commercial real estate. The first approach is the present value of expected future income from an investment, or the discounted cash flow (DCF) approach. This method involves two steps: (1) estimating the future net operating income and residual value, and (2) calculating the present value of the cash flow by discounting the income stream at a risk-adjusted, required rate of return. The second approach is the market extract method in which capitalization rates from prior or current sales transactions are applied. A capitalization rate, analogous to a price/earning ratio used in securities markets, is simply a ratio of net operating income over price.

In theory, the DCF and market extract approaches should result in the same valuation of an asset, because a capitalization rate reduces all the assumptions used in the DCF approach into a single number. Let's assume a simple world in which investors do not pay taxes, the cost of debt and equity is the same and buildings are purchased and held until they become obsolete. In this world, the capitalization rate equals: the risk-adjusted required rate of return – the expected NOI growth rate + the economic depreciation rate for the building.<sup>1</sup>

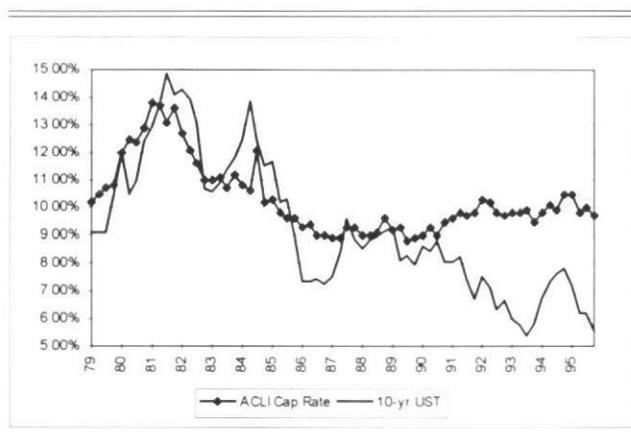
## Data On Capitalization Rates

Although capitalization rates are probably the most important performance/valuation measure for commercial real estate assets because of their prevalent use, they are probably the most difficult pieces of information to obtain. In the public REIT market, the proxy for capitalization rates is the ratio of funds from operation (FFO) over the market value of debt and equity. However, at least two factors make the use of this ratio difficult. First, the market value of debt is difficult to assess unless it is publicly-traded. Second, the market value of equity incorporates intangible franchise value which cannot be easily valued as distinct from the total value of the enterprise.

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**FIGURE 1**

Capitalization Rate for Industrial Properties—ACLI



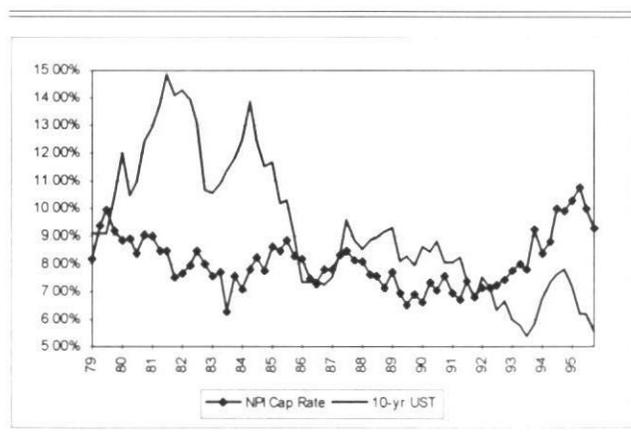
In the private market, capitalization rates are difficult to obtain due to infrequent sales transactions and the proprietary nature of private property operating information. In the absence of a reasonably reliable method of valuing commercial real estate, institutional investors primarily rely on appraisals to monitor the value of their assets. Two appraisal-based capitalization rate series provide the sufficiently long history as well as broad sampling necessary for time-series analyses. They consist of commercial mortgage commitment data from the American Council of Life Insurance (ACLI) and the Property Index (NPI) from the National Council of Real Estate Investment Fiduciaries. Throughout this article, data for the industrial/warehouse property type at the national level will be used as an example. This property type was chosen because it is least affected by diverging definitions of NOI. However, the methodology of the analysis for other property types should be the same. The ACLI data is provided by large life insurance companies which underwrite commercial mortgages. The data, published quarterly, include summary information for mortgages including capitalization rates, loan-to-value ratios, interest rates and amortization terms.

Figure 1 illustrates historic capitalization rates for industrial properties taken from the ACLI series between 1979 and 1995. The series has an average of 10.32 percent with a standard deviation of 1.29 percent. Until the 1990s, the series is highly correlated with the 10-year U.S. Treasury interest rate series. Between 1979 and 1995, approximately 56 percent of variance in capitalization rates can be explained by the movement in interest rates.

The NPI is compiled quarterly from data provided by investment advisors who own commercial

**FIGURE 2**

Implicit Capitalization Rates based on NPI Warehouse Data



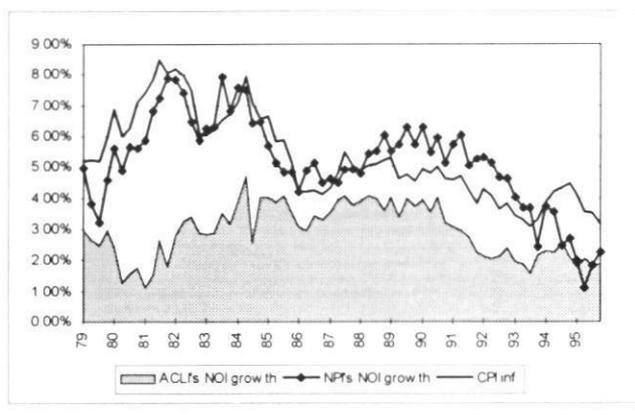
real estate on behalf of pension funds and other institutions. The NPI data provide a time series for net operating income and price on a quarterly basis. Since the capitalization rate is the ratio of the expected net operating income for the next year divided by this year's price, one can calculate the implicit capitalization rate for the properties included in the NPI. To estimate the expected net operating income for the next year, the current year's change in net operating income was extrapolated. As shown in Figure 2, implicit capitalization rates averaged 8.08 percent with a standard deviation of 0.97 percent between 1979 and 1995. The income return series, as reported by NPI, has a slightly lower average (i.e., 7.81 percent) and lower volatility (i.e., a standard deviation of 0.74 percent) during the same time frame. Unlike the ACLI data, the implicit capitalization rate series is not even modestly correlated with the interest rate series, as shown in Figure 2.

Each of the series contains problems associated with how capitalization rates are estimated. Specifically, ACLI's series is based on artificial net operating income which is arrived at by assuming that a building is operating under full occupancy, defined typically as 95 percent. In a market environment characterized by much lower occupancy rates, this assumption would lead to unrealistically high capitalization rates. Also, most investment advisors who supply the NPI data are required to have their properties appraised by independent appraisers only once a year. During the year's other three quarters, these advisors use internally generated appraisals.

Notwithstanding the problems associated with the capitalization rates derived from these series, it is important to understand them. To value assets

**FIGURE 3**

Expected NOI Growth and CPI Inflation Rates



properly, one must understand what is determining market capitalization rates. A careful analysis of capitalization rates can help investors determine whether an investment opportunity is over-priced or under-priced based on market fundamentals.

#### Analysis Of Expected NOI Growth Rates

Since a capitalization rate series can be derived from the ACLI and NPI data, and assuming that the economic depreciation rate is 2.47 percent per year, one can estimate expected NOI growth rates between 1979 and 1995 as shown in Figure 3. The series, based on the ACLI data, has an average of 2.92 percent with a standard deviation of 0.86 percent. Therefore, the series suggests that expected NOI growth rates fell within the range of 2 percent to 4 percent during most of the observed time frame.

The series based on the NPI data indicates an optimistic set of expectations. The expected NOI growth rates averaged 5.16 percent with a standard deviation of 1.50 percent. One might argue that the spread between these two expected NOI growth rate series may be explained partly because the properties included in the NPI data consist of institutional quality buildings, whereas those included in the ACLI data are typically a mix of Class A, B and C buildings. However, the magnitude of the spread has not been consistent over time, making this explanation difficult to accept.

A comparison of these expected NOI growth rates against 10-year CPI inflation expectations reveals interesting results as shown in Figure 3.<sup>2</sup> The expected 10-year CPI inflation rate series averaged 5.29 percent with a standard deviation of 1.41 percent. This suggests that the series mirrors the expected NOI growth rate series based on the NPI data.

**FIGURE 4**

Actual Annual Changes in NOI and CPI

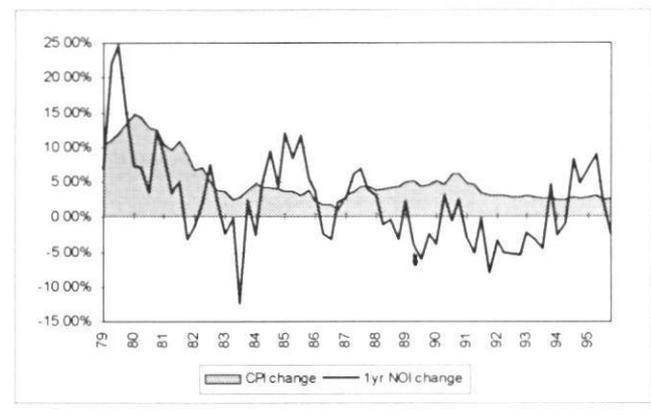


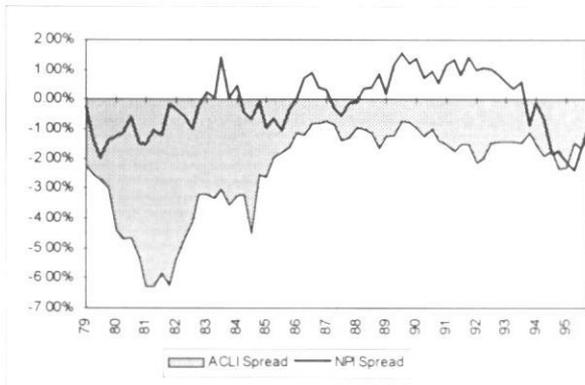
Figure 4 illustrates actual annual changes in the NOI index from the NPI data and CPI between 1979 and 1995. Although the CPI series averaged 5.14 percent with a standard deviation of 3.35 percent, actual annual changes in NOI averaged only 2.34 percent with a standard deviation of 6.59 percent. During this time frame, actual changes in NOI have not only been low compared to CPI, but also far more volatile. Therefore, one can conclude that investments in warehouse properties have provided only modest protection against inflation. More importantly, actual changes in NOI are not correlated with expected NOI growth rates. This is clear evidence that prior real estate market performance is not incorporated into the valuation process.

Figure 5 illustrates the spread between expected NOI growth rates and 10-year CPI inflation expectations. It is quite evident that investment advisors' expectations of NOI growth, based on the NPI data, are highly correlated with CPI inflation expectations. In fact, the average spread between these two series was negligible at 0.13 percent.

The expected NOI growth rate series based on the ACLI data is insensitive to expected inflation rates between 1979 and 1995. However, a remarkably close relationship existed between these two series during the period of 1987-1995 with an average spread of negative 1.41 percent. This negative spread probably existed because industrial vacancy rates during this period were above the equilibrium level. If market conditions were to approach equilibrium, the spread should tighten because rents are likely to increase at a faster pace. Prior to 1987, the spread between the ACLI-based expected NOI growth rates and general inflation rates was significantly lower, averaging negative 3.45 percent. In hindsight, since rents have not kept up with inflation through most of the 1980s, one can conclude

**FIGURE 5**

Spread Between Expected NOI Growth and 10-Year CPI Inflation Rates



that the ACLI-based expected NOI growth rates were closer to the actual changes in the NOI index. More specifically, such a large spread may be explained by industrial vacancy rates, which increased from 2.7 percent in 1978 to 5.8 percent in 1986. Obviously, if vacancy rates rise significantly beyond the equilibrium level, one would not expect rents to keep up with inflation rates.

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## Conclusion

Based on analysis of capitalization rates derived from the NPI data, one can conclude that they are highly correlated with inflation expectations reflected in the Treasury market. The lack of correlation between past performance and expected NOI growth rates suggests that real estate market conditions have been delinked in the valuation process. If real estate market conditions had been in equilibrium throughout the observed time frame, this would not have been a source of concern. However, history has shown that real estate markets are usually in disequilibrium.

Given that an increasing number of institutional investors are focusing on opportunistic investments, the finding that disequilibrium in real estate market conditions is not fully priced in the valuation process indicates that the analysis of capitalization rates can be a useful tool for identifying investment opportunities. For example, investors can use the NPI data in Figure 5 to support their acquisition or disposition decisions. When the spread is persistently positive (e.g., between 1988 and 1993), market sentiment is probably overly bullish. Therefore, investors should monitor market conditions carefully to consider selling their investments. Conversely, if the spread is abnormally negative, the market may be overly bearish. The second half of 1994 and the first half of 1995, when the spread was around -2.0 percent, appears to have been an opportunistic period to acquire warehouse buildings. Since the series has a mean of 0.13 percent, the spread is very likely to approach or exceed zero in the near future.

## NOTES

1. The **risk adjusted required return** can be estimated using the capital asset pricing model (CAPM) and data provided by industrial public REITs. The risk adjusted rate of return would be 9.75% assuming a 7% yield on the 10-year U.S. Treasury, a market rate of return of 12% (the historic average for the S&P 500) and a weighted average beta for industrial REITs of 0.55. The **economic depreciation rate** can be assumed to be 2.47% based on a study by Charles Hulten and Frank Wykoff, "The Measurement of Economic Depreciation," in Charles R. Hulten, ed., *Depreciation, Inflation, and the Taxation of Income from Capital*. The **expected NOI growth rate** is the most difficult to calculate so it is often assumed to grow at the rate of inflation. However, NOI is unlikely to grow at the rate of inflation unless real estate market conditions are at or near equilibrium.
2. To arrive at 10-year CPI inflation expectations reflected in Treasury rates, the historic average real interest rate of 3.0% is assumed when 10-year U.S. Treasury averaged 7.0%. When the Treasury is above or below 7.0%, real interest rates should also be higher or lower than 3.0%. Accordingly, the expected 10-year CPI inflation rate is defined as 10-year U.S. Treasury yield\*0.57. The resulting expected 10-year CPI inflation series mirrors very closely with survey data in "Survey of Professional Forecasters" by the Federal Reserve Bank and "Decision-Makers Poll" by Dick Hoey.

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