

PRICES AND APPRAISALS: WHERE IS THE TRUTH?

Acquisition capitalization rates support real estate index income returns.

by Ben D. DeVries, Mike E. Miles and Stephen B. Wolgin

"Shaky pension fund real estate portfolios likely will be slashed in value by 15% to 20% this year, the deepest cut ever . . . I personally believe there is going to be another round of write-downs in 1992. I don't think we are at the bottom yet in all property types and in all markets," said AT&T's Mr. Russo. . . . Greenwich Associates' Mr. Smith believes, "a case can be made for a 20% spread between what real estate money managers are asking for their properties and what the private market is willing to pay." That spread is so wide, said Mr. Smith, "that real estate sales have virtually halted."¹

An investor can buy a high-quality, unleveraged apartment house at the current market price and get an 8.5% first-year yield (NOI/price). The Russell-NCREIF annual income return is only 7.2% (first quarter 1992 annualized). Since income return provided by the index is a composite of property incomes divided by appraised values, are properties in the index on average overvalued? How accurate are the indexed properties' appraisals?

This article addresses this issue in four steps. It looks at the nature of real estate income return indices in terms of their intended benefits and the constraints associated with their construction. With this background, it examines the best available empirical evidence on the reliability of appraisal, labeling the result: the traditional appraisal lag. Using this foundation, it returns to the questions above and attempts to numerically reconcile index income yields with acquisition rates. Finally, the conclusions are reported.

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The Nature Of Indices

What are the benefits of indices?² The reasons for having indices are no different today than they were at the turn of the century, when Irving Fisher wrote the highly acclaimed, (but not widely read) *The Making of Index Numbers*:

“To determine the pressure of steam, we do not take a popular vote: we consult a gauge. Concerning a patient's temperature, we do not ask for opinions: we read a thermometer. In economics, however, as in education, though the need for measurement is as great as in physics or in medicine, we have been guided in the past largely by opinions. In the future, we must substitute measurement. Toward this end, we must agree upon instruments of measurement . . .

The use of yardsticks of 40 different lengths would be a source of confusion: the use of 40 different kinds of index numbers is no less confusing. If experts fail to clear up this confusion because they disagree on non-essentials, it will seem to many people, to whom the mathematics of the subject is a mystery, as though the experts could not agree on fundamentals. And so, without due cause, index numbers in general will be discredited and the study of economics impeded. For this reason, it is to be hoped that all those who are capable of understanding the subject will agree in adopting and advocating for general use the Ideal Formula or a closely similar formula.”³

Drawing from Fisher and our own experience with contemporary real estate investment management problems, we have prepared a list of reasons for a real estate index (Exhibit 1). As this exhibit clearly indicates a reliable real estate performance index is critical to the institutional real estate investment community.

The progression of improvements in stock market indices can provide a framework for understanding the first of the real estate performance indices, e.g., the Russell-NCREIF Property Index. We appreciate that no index is perfect. Investors continue to use the “Dow”, even though it may be the most

flawed of all stock market indices, because they understand it. Unless we develop a similar understanding of the Russell-NCREIF Property Index, we will not achieve the objectives listed in Exhibit I.

EXHIBIT I

Why Have Real Estate Indices?

1. To study ex post performance (e.g., of an asset class) as a benchmark for asset allocation models.
 2. To evaluate investment manager performance and to link such evaluations to investment philosophy and fund time horizons.
 3. To manage passive investment strategies and all modified forms of “In Real Estate” diversification.
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Table 1 lists several commonly used stock and body performance indices and illustrates the following conclusions:

- Indices have evolved (and improved) over time.
- No index is perfect, but the right index is very helpful in dealing with the issues laid out in Exhibit 1.
- One can use an index effectively only when one understands how it was created.

With this in mind, we believe it is instructive to consider the formulation of the Russell-NCREIF Index.⁴ (The Appendix to this paper describes in some detail the construction and composition of the Russell-NCREIF Index.) Not a measure of all real estate,⁵ the index measures the performance of institutionally owned property (specifically pension fund real estate assets).⁶ It is constructed from a combination of accounting records and appraised values. Consequently, its reliability is a direct function of the quality of the underlying appraisals.

The Traditional Appraisal Lag

The best way to evaluate the reliability of commercial appraisals for the Russell-NCREIF properties is to compare the market value of properties that have been sold with presale appraised values. In 1991 a

TABLE 1

Common Economic Performance Indices

Indicator	Sample	Representation	Method
Dow-Jones Industrial Average	30 Industrial stocks	Covers 29% of all stock values	Price weighted
S&P 500	500 stocks	Covers 70% of all stock values	Value weighted
Wilshire 5000	About 5000 stocks	Covers over 98% of all stock values	Value weighted and adjusted for cross ownership
Russell 3000	About 3000 stocks	Covers over 96% of all stock values	Value weighted and adjusted for cross ownership
Salomon Brother's Broad Index	Bonds	Most investment-grade bonds	Constant maturity (approximate)

group at the University of North Carolina extensively studied verified sale prices of 469 properties from the Russell-NCREIF database with their pre-sale appraised values.⁷

Overall, the sale prices were 1.6% higher than the last appraised values. When broken down by time period, equal-weighted results, based on percentage differences, varied:

Overall mean	+1.6%
	(equal-weighted)
1978-1985 (the "up market")	+7.8%
1986-1987 (the "flat market")	+2.3%
1988-1990 (the "down market")	-3.3%

Since appraisals tend to lag market prices due to the nature of the appraisal process, these results seem logical.⁸

This type of analysis is useful for an investor who is concerned about the reliability of a total portfolio. To those concerned about the reliability of each appraisal, an analysis of absolute differences may be more useful. The results of an analysis of absolute differences are as follows:

Overall absolute average	10.7%
	(equal-weighted)
1978-1985 (the "up market")	12.7%
1986-1987 (the "flat market")	8.8%
1988-1990 (the "down market")	10.3%

Some of the variance in the 1978-1985 period may be due to lack of attention directed at the appraisal process. The differences in the 1986-87 period are smaller because the market was more stable and investment managers focused more attention on appraisals. The larger differences in the 1988-1990 period are attributable to the increased volatility of the market.⁹

When the two analyses above are value weighted (i.e., when the larger properties are allowed to have more influence), the results are not radically different. On an arithmetic basis, the values are:

Overall mean	+1.5%
1978-1985 (the "up market")	+7.3%
1986-1987 (the "flat market")	+4.0%
1988-1990 (the "down market")	-1.5%

After accounting for the reliability of individual appraisals (i.e., the absolute value approach), the value-weighted differences are:

Overall absolute average	9.2%
1978-1985 (the "up market")	9.9%
1986-1987 (the "flat market")	8.9%
1988-1990 (the "down market")	9.1%

On a property-by-property basis, the differences are much greater. Thirty-six properties sold at prices that exceeded their appraisals in the previous quarter by 20%, while 29 properties sold at prices that fell below their appraisal value by 20%.¹⁰ Although individual properties at times sold for prices that differed significantly from their appraised value, the differences tended to cancel out one other. Therefore, we conclude that a rather high degree of confidence may be placed in the unit values that have been attached to larger portfolios of properties.

For our purposes in this analysis, the traditional appraisal lag in a down market may be defined as 1.5% to 3.3%. This is the expected overvaluation range we used to reconcile index income yields with current acquisition rates.

Reconciling The Numbers

The question: The investor can buy a high-quality, unleveraged apartment house and get an 8.5% first-year yield. The Russell-NCREIF income return is 7.2%. Since the income return is "basically" income divided by appraised value, are the properties in the index overvalued?

Before reconciling the numbers, we make two assumptions. First, we assume that we will obtain the first year pro forma income. Investors base their current yield of 8.5% on expected income. In this analysis we grant the assumption (i.e., we make no adjustment for the fact that next year's expectation is being compared to last year's reality, audited reality in the case of the Russell-NCREIF Index).

Second, we address the income versus sustainable cash flow question. Recognizing that in the early years replacement costs will be low for new properties, we assume that an adequate reserve for replacement has been deducted from the pro forma NOI (i.e., that the acquisition pro forma has a reserve percentage appropriate for the expected holding period not just for the early years). These two assumptions make reconciliation more difficult but strengthen the conclusions.

The first step in the reconciliation is an adjustment by property type (shown in Exhibit II). This easy "look-up" calculation increases the 7.2% Russell-NCREIF income return to 7.6%.

EXHIBIT II

Property Type Adjustment: Apartment

A portfolio composition adjustment is needed in any comparison.

In this very simple example, the 8.5% pro forma is compared with the NCREIF ex post apartment income return of 7.6% (first quarter 1992 annualized), not the 7.2% overall index income return.

The second necessary adjustment is for price level changes, shown in Exhibit III. Even in a low-inflationary environment income usually rises with the general price level on properties, such as apartments that have six- to 12-month leases.

To complete the test of the reliability of the appraisal-based index numbers, we consider the portfolio occupancy question. While acquisition capitalization rates tend to reflect a stabilized occupancy close to 95%, few existing portfolios average 95% occupancy across all apartments. Exhibit IV shows the implied occupancy calculated from the

adjusted Russell-NCREIF income return. If operating expenses are fixed, then the \$70,588 unit value (8.5% capitalization rate) will earn the adjusted Russell-NCREIF return (7.8%) when the property generates revenue of \$9,506. This implies occupancy of 90%, as indicated.

EXHIBIT III

Inflation Adjustment

Assume "all else is equal" and that ex post income will be higher with the passage of one year by the general rate of inflation. Inflation is currently around 3%. Thus: ex post income $7.6\% \times 1.03 = 7.8\%$ ex ante income.

EXHIBIT IV

Implied Vacancy

Hypothetical apartment

Revenue at 95% occupancy	\$10,000 (potential \$10,526)
Operating expense	4,000
NOI	6,000

Market value at acquisition capitalization rate of 8.5% = \$70,588

For this property (if valued fairly) to fit in the Russell-NCREIF Index perfectly, it would have to earn 7.8% (Exhibit III) on \$70,588 or \$5,506.

If operating expenses are unchanged over this modest occupancy range, then the revenue is \$5,506 + \$4,000 or \$9,506.

This implies an adjusted occupancy of $\$9,506/\$10,526$ or 90%.

It has been our observation that most institutional managers have apartment portfolio occupancies in the 85% to 95% occupancy range with a clustering in the low 90% occupancy range. Thus, the implied occupancy of 90% is on the low side of the appropriate range.

If we use the traditional down market appraisal lag (1.5% to 3.3%), then the reconciliation fits right on the clustering. Applying the 1.5% lag (value-weighted mean) to the example in Exhibit IV, the \$70,588 figure is overstated by 1.5% to \$71,647; so the income return at 7.8% is \$5,588, which implies an occupancy of 91% ($\$9,588/\$10,526 = 91\%$). We cannot be exact about the average institutional apartment portfolio occupancy; 92% is, however, an average of the unverified quotes we have seen. This would imply that the appraisal lag is just over 4%¹¹, which is not an unreasonable figure given the historical evidence and the difficulties caused by the lack of comparables in today's illiquid market.

Conclusion

We have examined the intent, construction and nature of real estate indices, explored the empirical evidence for appraisal reliability and numerically reconciled an index income return with the current capitalization rate for a typical apartment acquisition. This analysis suggests that it is possible to reconcile reported index income returns with acquisition capitalization rates. Our analysis also shows that the well-documented appraisal lag probably still exists, but it is not anywhere near the magnitude suggested in the popular press.¹² It takes time to conduct the appraisal process; so some lag is to be expected despite the diligence of appraisers and investment managers. The lag today, however, is no larger than it has been historically. It should become smaller as markets stabilize and appraisers have more transactions to evaluate.

NOTES

1. Pensions & Investments, April, 1992.
2. Theoretical work on indices can be traced to Laspeyres who first proposed formulas in 1864. In fact, much of this theoretical work has continued as the U.S. stock market has made several attempts to measure the movement of common stock prices. Each effort has improved the industry's ability to measure and portray the average experience of investors in the U.S. common stock asset class. Imagine the surprise of investors in 1938, when they learned that the Cowles Commission Standard Statistics Index of U.S. stock market performance had gained 364% from the period 1871 through 1937, but the Dow-Jones average covering nearly the same time period was up only 149%! This information was powerful in the late 1930s as investors recovered from the 1929 stock market crash. The differences in returns were attributed to an improved calculation methodology (market capitalization weighted versus price weighted) and a much broader representation of stocks. (The latter methodology included 351 stocks versus 30 stocks in the Dow-Jones Industrial Average.)
3. Fisher I: *The Making of Index Numbers*.
4. For a very interesting alternative approach using publicly traded real estate securities, see Torres', Michael: "Finding Answers to Real Estate in the Public Markets," Wilshire, September, 1991.
5. For a measure of the total size of the U.S. real estate market, see Miles, Mike: "What Is the Value of All U.S. Real Estate," *Real Estate Review*, Summer, 1990, and Miles, M., Pittman, R., Hoesli, M. and Blatnager, P.; "Real Estate Wealth," *Journal of Property Management*, 1991.
6. Returns are time weighted not value weighted because, in general, pension funds (and their consultants) use time weighted returns rather than internal rates of return to evaluate their investment managers' performance. Pension funds typically retain the responsibility for both the timing and amount of cash flow (i.e., contributions and withdrawals) to and from the investment manager. The time-weighted return is preferred because the formula minimizes the impact of cash flows on the return, and therefore, it allows one to directly compare returns with different cash flow patterns. It is important to note that internal rates of return and time weighted returns are identical when there is no cash flow.
7. See Miles, M., Guilkey, D., Webb, B., and Hunter, K.: *An Empirical Evaluation of the Reliability of Commercial Appraisals, 1978-1990* (Chapel Hill, NC: University of North Carolina, August, 1991.)
8. The appraisal process draws heavily on "comparable" sales and rents that must have occurred at a prior date.
9. In this analysis the authors looked at eight quarters of appraisals. Interestingly, while a few of the appraisals in the most recent quarter obviously were done with a contract of sale in hand, the earlier appraisals were not materially less accurate after adjustments were made for price level changes.

10. The researchers overlaid this data upon economic and population data in a simultaneous estimation procedure producing the following insights: First, prices tended to exceed appraised values in areas with higher than normal growth in population, on properties in better locations and on larger properties (measured by sales prices). Second, prices tended to be lower than appraised values on properties with high vacancies. Third, appraisers tended to be more accurate in valuing properties with high income per square foot and great functionality. Fourth, appraisers tended to err more on office properties with high vacancy rates and on properties in better locations.

11. The market value of \$70,588 is overstated by 4% to \$73,412. If this higher volume achieves the adjusted Russell-NCREIF return of 7.8%, then the revenue is \$9,726, implying an occupancy of $(\$9,726/\$10,526) = 92\%$.

12. The press often points out that income returns on the Russell-NCREIF Index have come down by 200 basis points over the decade, while real estate risk appears to be going up. The apparent anomaly is explained by judging real estate in a capital market context. Real estate yields have come down far less than bond yields which is logical given the increasing risk associated with real estate over the decade.

APPENDIX

Construction Of The Russell-NCREIF Property Index

A. Rules For Inclusion

1. Property must be held for a tax-exempt investor by a member of National Council of Real Estate Investment Fiduciaries.
2. Property must be *unleveraged*; leveraged properties are reported in a separate index. Unleveraged properties have the following characteristics:
 - Institutional real estate investments
 - Income producing
 - Fiduciary environment
 - Urban or suburban commercial; no agricultural or timber
 - Unleveraged or less than 5% debt
 - Wholly owned or joint venture
 - Existing; no pre-development
 - No development/lease up risk; properties must be 80% leased before inclusion

B. Rate Of Return Formula

$$\text{Income return} = \frac{\text{income}}{\text{beginning market value} + 1/2 \text{ capital improvements} - 1/2 \text{ partial sales} - 1/3 \text{ income}}$$

$$\text{Total return} = \frac{(\text{ending market value} - \text{beginning market value}) + \text{partial sales} - \text{capital improvement} + \text{income}}{\text{beginning market value} + 1/2 \text{ capital improvements} - 1/2 \text{ partial sales} - 1/3 \text{ income}}$$

C. Number Of Properties And Market Values Over Time

(Years at 12/31)

Russell-NCREIF Property Index

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Number of properties	291	371	493	681	781	846	907	991	1055	1100	1181	1274	1508	1622
Market value (in billions)	\$0.73	\$1.23	\$1.98	\$3.67	\$4.89	\$6.07	\$7.89	\$10.95	\$12.21	\$12.81	\$15.61	\$17.36	\$22.31	\$21.91

D. Distribution by Region

	Value (Years at 12/31)			U.S. Population 1990
	1978	1984	1991	
East	26.03%	24.46%	22.78%	20%
Midwest	20.55	15.97	15.88	24
South	17.80	24.97	17.66	35
West	35.62	34.60	43.68	21
TOTAL	100.00%	100.00%	100.00%	100%

E. Distribution By Property Type

	Years at 12/31		
	1978	1984	1991
Apartment	0.00%	0.00%	11.14%
Office	23.29	49.68	32.68
Retail	19.18	19.26	26.15
Research and development	6.85	9.51	10.41
Warehouse	34.27	15.97	17.57
Hotel	16.41	5.58	2.10
TOTAL	100.00%	100.00%	100.00%