

In a portfolio context, statistical comparisons of historic appraisals and subsequent sales prices show little variation.

Pension Fund Investment Managers' Unit Values Deserve Confidence

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THE FACT THAT Goldman Sachs has issued its second position paper advocating the inclusion of "property" in the institutional portfolio indicates that real estate had clearly become more than a means to sell tax avoidance even before the Tax Reform Act of 1986. In May 1986, *Pension and Investment Age* reported that real estate equities held by tax-exempt funds totaled over \$40 billion, or nearly 4 percent of the aggregate pension fund portfolio.

Despite overbuilding in several markets, most forecasters expected continued long-term growth in pension fund real estate investment for at least three reasons:

- Risk-adjusted real estate returns were very attractive in the 1970s;

- Evidence of real estate's diversification benefits and inflation protection add to the allure; and
- A comparison of projected pension fund aggregate size to world investable wealth indicates

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This article was adapted from a larger study with a major bibliography and substantial footnotes.

The authors appreciate the help of Kim Smith of the Frank Russell Company in the preparation of the original work. The financial support of the National Council of Real Estate Investment Fiduciaries is gratefully acknowledged. However, the NCREIF neither endorses nor rejects the results of this study.

that pension funds are almost forced to increase their investments in real estate.¹

Although real estate has ceased to be a "nontraditional" investment, serious questions still confront real estate investment managers and pension fund investors. One of the most difficult problems is whether pension managers' periodic valuations of their real estate portfolios are accurate. Because real estate is heterogeneous by definition, valuations cannot be drawn from exact prices in an active market. In order to extract opinions of the value for the property rights owned by the pension fund investor, appraisers must rely on transactions that involve similar but not identical properties.

Pension investors must evaluate their investment managers and their funds' investment performance on a periodic basis. Change in the portfolios' market value is a critical part of the total return, so that pension investors must continue to rely on appraisals in order to value their return. This reliance raises two questions: How reliable are the appraisals? and What degree of confidence can a pension fund investor place in a real estate investment manager's unit value calculation? (The unit value is the sum of the appraised values of all the properties that the fund holds, divided by the number of units in the fund.)

The study described below indicates that the differences in the sales price of recently sold pension fund properties and preceding appraised values (adjusted for inflation) are, on average: small, positive (i.e., sales prices were greater than appraised values), and decreasing over time.

EARLY STUDIES OF REAL ESTATE RETURNS AND CRITICISM OF THOSE STUDIES

In the Spring 1984 issue of the *Journal of Portfolio Management*, Zerbst and Cambon summarized the major databases then in existence that measured returns on real estate investment.² In the fall of 1984, the *AREUEA Journal* published a special

¹ Clearly, the investment needs of pension funds can't be totally accommodated with large office buildings in New York and San Francisco. However, when other property types in other locations are packaged to facilitate pension investment, the investment pool is quite large. And when individually owned real estate equities are added to the vast quantity of corporate real estate, the property pool is easily big enough to provide meaningful diversification even for the large and growing pension fund reserve pool (total U.S. investment-grade commercial real estate totals \$2.5 trillion according to Goldman Sachs, and \$1.8 trillion according to Salomon Brothers).

² Zerbst & Cambon, "Historic Returns on Real Estate Investment," *Journal of Portfolio Management* (Spring 1984).

issue on commercial real estate investment that summarized recent academic thinking about real estate return issues. The conclusions of these studies can be summarized as follows:

- Real estate has offered higher returns and lower project risk (whose risk is measured by the standard deviation of project returns) than stocks or bonds.
- Real estate has offered an attractive diversification opportunity for portfolios that are invested primarily in stocks and bonds. (The correlation of real estate returns with stock and bond returns is quite low or negative.)
- Real estate has offered an attractive inflation hedge while stocks and bonds have not.

Because no one believes that any investment can be so attractive, the findings of these studies have been subjected to a host of criticisms. Some have argued that measured returns should be adjusted downward for a series of costs and risks that are peculiar to real estate investment, such as high information costs and lack of marketability.³ More often, two specific criticisms were directed at the various real estate return series reported in the literature.

- The reported market values came from appraisals or some other estimates, not from transactions. Consequently, the reported returns were unreliable and the variance of the return stream was clearly understated.
- The reported returns came from only one type of property, one location, or one investment manager. Hence, the reported returns were idiosyncratic in nature and not generalizable.

Typical stock and bond investors would compare the returns in the real estate indices with realized REIT returns and conclude that the variability of REIT returns was prima facie evidence that appraised values from a limited number of sources were not at all representative of the market performance of real estate.

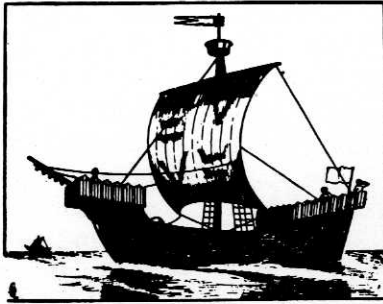
METHODOLOGICALLY, APPRAISALS ARE SIMILAR TO STOCK MARKET PRICES

It is true that appraised values are not transaction prices and that as sources of information they are inherently inferior to actual prices. However, if the

³ The best presentation of this literature, known as "NET," is found in Ibbotson & Siegel, "Real Estate Returns: A Comparison With Other Investments," *AREUEA Journal* (Fall 1984).

appraisals are made by trained professionals who use sales and rental data from comparable properties and who employ sophisticated discounted cash-flow analysis, then the appraisals should contain reasonably reliable information.

In its simplest form, a stock price may be thought of as the product of the stock's earnings per share and an earnings per share multiplier. A simple opinion of value is the quotient of an estimated stabilized NOI divided by a capitalization rate.



(The cap rate is the reciprocal of the earnings per share multiplier.⁴) Certainly the appraiser's estimate of stabilized net operating income may be less than perfect because of his assumptions about occupancy and reserves; but the earnings per share number is also an estimate that makes assumptions about the deferred taxes, pension reserves, and foreign currency translation/restatement. Similarly, the appraiser's capitalization rate includes consideration of (but not specification of) tax benefits, financing potential, and growth prospects, yet so does the earnings per share multiplier. In total, the two techniques are essentially equivalent, and indeed the real estate numerator (net operating income) may be more reliable than the earnings per share figure, simply because the projected net operating income isn't clouded by all the accounting conventions that affect earnings per share. Consequently, it may be argued that if an appraisal is based on reliable comparable sales and rentals, then its reliability should be only slightly more questionable than the stock market's translation of earnings per share into stock prices.

⁴ Modern valuations employ discounted cash flow of pro forma net operating income, but the theory behind this tool is the same as that behind the simple techniques we are using to make an illustrative point.

Continuing the comparison between the two techniques, the closing price of General Electric common stock on a specific date is, of course, a marginal price. It is the price that cleared the market at that time, but it is not necessarily the price that an institutional investor could expect to pay per share for a large block of General Electric shares. The price paid in corporate takeovers and the number of recent "green mail" cases suggests that there are also serious agency questions surrounding market clearing stock prices. Similarly, although property returns based on appraisal indices have been criticized because they understate the variance of returns received from actual sales, the overall variance of stock market indices appears to be far greater than the logical change in value of the underlying productive assets.

STUDYING THE RELIABILITY OF UNIT VALUES

As fiduciaries, both pension trustees and real estate investment managers must continuously value their units. They are concerned with the scarcity of documented transactions data in the real estate marketplace that leads to their reliance on appraisals. They therefore ask two types of questions. First, how good a job are appraisers doing? (One measure of accuracy is the absolute percentage difference between realized sales prices and earlier appraised values.⁵) Second, how much confidence can pension funds place in the unit values reported by investment managers? The second question is also related to appraisal quality, but it adds the portfolio dimension. An investor in a multiproperty portfolio isn't likely to be seriously hurt by one faulty appraisal but he properly fears appraisal biases that might affect several properties in the portfolio in the same manner. This study focuses on the second issue.

The Database

We examined the sales prices of the 147 properties that have been sold from the FRC Property Index database. The FRC Property Index is produced by the National Council of Real Estate Investment Fiduciaries and the Frank Russell Company and is widely used by institutional real estate investors. The Index is based on the current values of over 1,000 properties managed by nearly forty institutional investment managers that have an ag-

⁵ Cole, Guilkey & Miles, "Assessment of the Reliability of Commercial Appraisals," *Appraisal Journal* (July 1986).

gregate market value of over \$11 billion.⁶ Because all major property types and many geographic locations are represented, the index is far less idiosyncratic than any of its predecessors. Although the returns on FRC Index properties are not generalizable to all real estate, they are fairly representative of the returns to unlevered equity ownership of "investment grade" properties (large commercial income-producing properties in major metropolitan markets). Index returns are based on both reported investment income and quarterly appraised values of the underlying properties.

The FRC Index properties that we examined were sold in the period from January 1978 to June 1985. They represent about 15 percent of the number of properties that have entered into index calculations during this period. We compared realized cash proceeds to preceding appraised values in order to obtain a check on the reliability of investment managers' unit values.⁷

A few unique situations resulted in sales proceeds that would not be expected to equal the appraiser's estimate of market value. For example, one current tenant was a buyer with unusual motivation. He had investments in unique tenant improvements as well as other operations in the area. Therefore, he paid more for the property than would have been expected from an outside investor. Since such situations are real in the market and

adversely affect the reliability of the unit values that are based on the appraiser's estimate of market value, they remain "unadjusted" in this database. In three sales, the sellers provided long-term income guarantees that clearly affected the sales prices. Since there was no straightforward way to adjust for the effect of these guarantees, these three sales were dropped, leaving a database of 144.

The authors investigated buyer and seller motivation on all the major outliers in the sample. In eleven cases, the sales price differed from the last outside appraisal by more than plus or minus 20 percent. The cause of these major differences were not technical errors by appraisers. They were either unique situations (no fault of the appraisers) or cases in which appraisers had *missed a major change in the market*. If "major" errors can occur for reasons other than "technical" reasons, the accuracy of appraisals will not be improved by the efforts of more or better-trained CPAs, MBAs, or CFAs. What is needed is a better fundamental understanding of the marketplace. As appraisers try to deal with the importance of urban politics in municipal joint ventures and the tighter interaction of operations and space (hotels, trade marts, data marts, etc.), the need to return to the interdisciplinary fundamentals of real estate should become even stronger.⁸

The Basic Data

Exhibit 1 is a chart of the mean percentage differences between the sales prices and appraised values. Most of the institutions appraise each property each quarter. Usually one outside fee appraisal is also performed each year. (One investment manager required no outside appraisals at all and the timing and the frequency of outside appraisals varied so that seasonal effects were both unpredictable and nonstationary.) The managers of the majority of the properties (held in open-ended funds) were conscientious about inside appraisals. Because some closings may have taken place even more than one quarter after the contract signing, columns 3 to 7 of Exhibit 1 list the mean difference using the

⁶ NCREIF members include: Aetna Life Insurance Co., Bank of America, Bank of Boston, Chase Investors Management Corp., CIGNA Capital Advisers, Inc., Citibank, N.A., Coldwell Banker Capital Management Services, Corporate Property Investors, Crocker National Bank, EastDil Advisers, Inc., The Equitable Real Estate Investment Management, Inc. States, First Chicago Investment Advisors, Goldman Sachs & Co., Heitman Advisory Corporation, InterFirst Bank Dallas, N.A., JMB Realty Corporation, John Hancock Mutual Life Insurance Co., Jones Lang Wooten Realty Advisors, LaSalle Advisors, Inc., Lehndorff & Babson Real Estate Counsel, Inc., Metropolitan Life Insurance Co., The Morgan Bank, NCNB National Bank of North Carolina, PM Realty Advisors, The Prudential Insurance Co. of America, The RREEF Funds, The Travelers Insurance Companies, TCW Realty Advisors, Wachovia Bank and Trust Co., N.A., Wells Fargo Realty Advisors.

Each member reports quarterly income and appraised values of the properties they manage for tax-exempt clients to the FRC Index. Most managers use outside appraisers at least once a year and some use outside appraisers every quarter for larger properties.

For a discussion of the evolution of institutional real estate investment see Melinkoff, a Note on "The Dawn of Property Investment by American Pension Funds," AREUEA Journal (Fall 1984). For a description of reporting procedures and investment concerns, see Miles & McCue, "Commercial Real Estate Returns," AREUEA Journal (Fall 1984).

⁷ The comparison required minor adjustments of reported proceeds for two sales that involved seller financing—essentially discounting to present value and adjusting sales prices accordingly.

⁸ Because the appraiser is often client-dominated and playing by rules established in the courts, there is considerable potential for misleading appraisals as the real estate markets become more complex. Court-made rules always lag marketplace reality allowing for some flexibility in interpretation. Client domination can add a bias to this flexibility which might adversely affect the reliability of the appraisal product. Recognizing this possibility, both NCREIF and the Pension Real Estate Association are working on standard appraisal engagement letters.

REAL ESTATE REVIEW

EXHIBIT 1

AVERAGE PERCENT DIFFERENCES BETWEEN NET SALES PRICES AND APPRAISED VALUES

(Values Are Positive When Sales Price Exceeds Appraised Value)

	Number of Properties (1)	Last Appraisal (2)	Number of Quarters Elapsed Between Comparison Appraisal and Sale ^a					Last Outside Appraisal (8)
			(3) 2 qtrs.	(4) 3 qtrs.	(5) 4 qtrs.	(6) 5 qtrs.	(7) 6 qtrs.	
<i>Total properties</i>								
<i>by region</i>								
East	144	3.37	2.77	2.23	1.67	1.33	-0.71	1.93
Midwest	19	2.29	2.43	1.77	0.39	-1.25	-1.68	-0.53
South	33	-1.97	-3.39	-4.43	-6.21	-4.98	-8.53	-3.64
West	49	7.20	6.21	5.24	4.69	5.19	3.75	5.04
	43	3.58	3.60	3.67	4.45	2.51	0.34	3.12
	144							
<i>By type</i>								
Apartments	4	19.75	22.55	26.50	25.65	19.32	20.26	23.90
Hotels	3	-1.39	2.32	0.81	3.25	2.10	0.32	-5.50
Industrial	68	5.40	5.53	5.30	4.38	4.69	3.06	4.33
Office	36	1.20	-0.34	-1.01	-1.00	-1.24	-3.24	-0.07
Retail	33	0.01	-2.13	-3.46	-4.17	-4.60	-8.18	-2.65
	144							
<i>By size</i>								
Less than \$2 million	60	3.43	1.61	0.37	-0.64	-0.45	-2.91	0.52
\$2-\$10 million	70	3.80	3.66	3.64	2.53	1.35	-0.72	3.55
Greater than \$10 million	14	0.95	3.38	3.00	7.36	9.48	9.60	-0.13

^a Appraisal values in these periods were adjusted for inflation.

appraisals of the last six quarters as well as differences based on the last appraisal (column 2) and differences based on the last outside appraisal (column 8). These differences are broken down by region, type, and size.

A bias in the data may result from the length of time needed to close a large commercial transaction. It is possible that at the end of the quarter preceding the sale, the property was already under contract. In such a case, the appraiser (properly) may have adjusted the opinion of value to reflect this information.

In order that the differences between sales prices and distant appraisals (two to six quarters prior to the sale) not be distorted by intervening inflation, the early appraisals are adjusted for inflation during the intervening period. This adjustment assumes mid-quarter sales and appraisals and uses the consumer price index (CPI-U) as a measure of inflation.⁹

For the total sample, the mean difference between selling price and the last appraisal is a positive 3.37 percent. The mean difference between the selling price and the last outside appraisal is much smaller, at 1.93 percent. Note that the differences decreased as the interval between sale and appraisal increased.

(Because the sales price was net of closing costs, in the case of "perfect" appraisals, the expected mean difference would be the average closing cost, which in this sample was about 2.5 percent.)

When broken down by region, the mean differences showed some variability. They were generally greater than 5 percent for southern properties and generally greater than 3 percent for western properties, indicating that the quarterly appraisals undervalued these properties. Mean differences for eastern properties were positive in more recent appraisals, but negative in more distant and outside appraisals. For midwestern properties, mean differences were consistently negative. (The appraisals overvalued the properties.)

Interesting results are evident when the comparison is made by property type. Industrial properties sold for more than 4 percent above appraisal value, whereas office properties sold at close to appraised value. Retail properties sold at close to their most recent appraised value, but sold below both earlier and outside appraised values. Unfortunately, the small size of the apartment and hotel samples (three sales of apartments and four of hotels) precludes any meaningful comments about the results of these types of properties.

By size, mean differences indicate that small and medium properties sold above their more recent appraised value, but that this premium declined as the

⁹ Similar results were obtained when the GNP implicit price deflator was used as an alternative measure of inflation.

interval between sale and appraisal increased. Large properties exhibited the opposite trend, with their sales premium over appraised value increasing with the interval between sale and appraisal.

Statistical Tests

We performed a number of statistical tests on the data in Exhibit 1, the details of which are omitted from this article.¹⁰ As expected, there is more variability in transition years such as 1982. Likewise, industrial properties show greater variability due to the well-known potential for upgrading high-grade industrial properties to office use in strong markets with tight zoning. Finally, southern properties and properties selling for less than \$2 million appear to exhibit much greater variability than properties in other regions or of other sizes.¹¹

We performed a series of ordinary least squares regressions, the results of which indicate that neither type, region, size, nor year can explain differences. (This supports the contention that significant diversification benefits exist within individual property types and regions.)

Because many investors are concerned that the appraisal may overstate value, we examined the distributions of negative and positive differences. Of the 144 sales, eighty-two sold for less than the last appraised value. Of these, the average difference from the last appraisal was -3.7 percent with a standard deviation of 3.7 percent.

By contrast, of the sixty-two properties selling for more than the last appraisal value, the average difference was 12.7 percent with a standard deviation of 25.5 percent. Clearly, these results indicate that the major portion of overall variability in the differences between sales prices and appraised values is due to upside variations.

The Effect of Portfolio Size

Miles and Graaskamp, argued in a 1984 article, that "small *might* be beautiful" in real estate invest-

ment management.¹² However, small portfolios would be more subject to appraisal reliability problems than larger portfolios given that the differences from sale to sale are relatively uncorrelated.

In order to investigate the effect of portfolio size on reliability, we generated 200 examples of portfolios of different sizes (i.e., 200 portfolios had three properties each, 200 had six properties and so on until we had ten sets of 200), the largest set containing 100 properties in each of its 200 portfolios. We then looked at the variance of the portfolio means (average differences between sales price and appraised value). The variance declined significantly with increases in portfolio size up to 50 properties. (The largest portion of this decline occurred in going from portfolios of one property to portfolios of nine properties.) These results are similar to those found in earlier studies of equities and bonds. This similarity should provide considerable comfort to institutional investors.



SUMMARY AND CONCLUSIONS

Sales of the FRC database properties indicate that individual sales prices may differ materially from appraised values and that there are a few cases of extreme differences. On average, these differences were positive, indicating that portfolio unit values may have been slightly understated. However, the large standard deviations associated with these differences imply that the mean differences are not significantly different from zero.

In marked contrast to the individual property results, the portfolio effect leads to a relatively high level of confidence in reported unit values. Increasing portfolio size leads to significant decreases in portfolio variance. In portfolios of even modest size, the implied validity of investment managers' reported unit values is quite high, particularly when compared with the reliability of individual property appraisals.

¹⁰ Interested readers may obtain details by writing Professor Miles at School of Business Administration, 202 Carroll Hall 012A, University of North Carolina, Chapel Hill, N.C. 27514.

¹¹ The large mean and standard deviation associated with southern, with industrial, and with small properties are all largely attributable to a single outlier.

¹² Miles & Graaskamp, "Real Estate Investment Management: Is Small Beautiful?" 14 REAL ESTATE REVIEW, 92 (Spring 1984).