Toward An Assessment of the Reliability of Commercial Appraisals

by Rebel Cole, David Guilkey, and Mike Miles

INTRODUCTION

The appraisal of a major commercial property is a complex and challenging task. Typically, the client requests an opinion of market value, often with his or her own unique definition of value. Although definitions vary and "a current definition of market value" cited in the Appraisal Institute's principal text[1] is quite distinguishable from a most probable selling price,"[2] most practitioners are comforted when arms-length transactions between astute buyers and sellers take place at prices close to appraised market value.

1. American Institute of Real Estate Appraisers, *The Appraisal of Real Estate,* 8th ed. (Chicago: The Appraisal Institute, 1983), 33.
2. Developed by Richard U. Ratcliff and popularized by James A. Graskamp, University of Wisconsin, and Halbert C. Smith, University of Florida.

Rebel Cole is a Ph.D. candidate in real estate economics at The University of North Carolina.
David Guilkey is professor of economics at The University of North Carolina and an econometrician who has contributed to both theoretical and applied literature.
Mike Miles is Foundation Professor of Urban Development at The University of North Carolina, where he specializes in real estate investment. He is a regular contributor to the *The Appraisal Journal.*

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This article examines a series of sales of commercial properties that had been recently appraised in an effort to assess the reliability of commercial appraisals. While there can probably be no perfect test of an opinion, we believe the data are informative. On average, the absolute difference in sales price and most recent independent appraisal was almost 9%.

THE DATA

The National Council of Real Estate Investment Fiduciaries (NCREIF), who, together with the Frank Russell Company, publish *The FRC Report*, has a membership that includes most of the major real estate investment managers. There have been 147 sales from their data base, which now includes the operating history of nearly $9 billion of commercial real estate. A comparison of the sales prices to preceding appraised values provides a test of the reliability of the commercial product.

Table 1 provides a breakdown of the data base which includes *all* FRC property sales occurring between January 1978 and June 1984. The sold property data base (like the complete *FRC* data base from which it comes) is generally well diversified by region, property type, and size.[3] An independent fee appraiser appraised

TABLE I

Characteristics of the Data Base
(Number of Properties in Each Category)

Region	East	19
	Midwest	33
	South	49
	West	43
	Total	144*
Type	Apartments	4
	Hotels	3
	Industrial	68
	Office	36
	Retail	33
	Total	144
Size	<$2,000,000	60
	$2–10,000,000	70
	>$10,000,000	14
	Total	144

*See text for an explanation of why three sales were deleted from the data base.

3. The one major exception to this statement is the lack of any large retail properties.

108 of the sold properties within the 18 months preceding sale. The remaining 36 were appraised in-house by a staff that included several MAIs and numerous MBAs. In total, the group of appraisers who produced these opinions of value includes the nation's largest and most respected appraisal firms.[4]

The direct appraisal client (the real estate investment manager) sets the unit value of its portfolio based on these appraised values. In the open-end funds (which constitute well over 50% of the properties in the data base), pension funds may buy into or sell out of the manager's funds at these unit values. Clearly, there is a strong incentive to have appraised values reflect investment values to the pension fund.

REASONS WHY SALES PRICES MIGHT NOT EQUAL THE APPRAISED VALUES

In this section several reasons why sales prices might deviate from appraised values are considered. Some result in adjustments that are reflected in the analysis presented in the following section. Others are necessary qualifiers to conclusions drawn from that analysis.

Terms of Sale

Fortunately, the vast majority of these sales were cash sales with no guarantees beyond typical general warranty deed covenants. In the four cases involving seller debt financing, the contractual payments were discounted to present value at one point above the then current yield on similar maturity treasury obligations. The differences from face values were small, and none of the sales involved high degrees of leverage which would have required additional adjustments for risk.[5]

In cases in which the seller owned less than 100% of the fee, the sales price was "grossed up" to match the appraised value, which was of the property in single ownership. (For example, if the seller had owned a 75% interest, the sales proceeds were multiplied by 100% ÷ 75% before comparison with the appraised value.) In three cases there were complex seller guarantees of future income which would possibly result in material deviation of actual seller cash proceeds from reported sales price. These three sales were dropped from the sample.[6] For the remaining 144 properties, the sales price was definitionally comparable to the interest being appraised by the appraiser, i.e., the definition of value was consistent with the terms of the sale except for the adjustment described above.

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4. One of the larger NCREIF members, Prudential Insurance, now spends nearly $2 million annually on outside fee appraisals.

5. The fact that few of these sales involved unusual financing does not mean that the appraisers could ignore adjustments for atypical financing or trends in what the market considered typical financing. Their opinions of value were extracted from the market. Many market transactions involved significant financing and, thus, necessitated adjustments before they could be used as comparables in the subject property valuation.

6. Two of these sales also involved seller debt financing, so that of the 144 remaining sales, only two involve seller debt financing.

Thin Markets and Buyer Motivation

For very large transactions there may be but a few large buyers actively bidding. In such cases the prices obtained may not reflect a true market consensus.[7] Additionally, for a few industrial properties, the buyer was the existing tenant. When the buyer has additional investments in unique tenant improvements, surrounding investments that are used in conjunction with the subject property, or other extra incentives to purchase, the market conditions surrounding the sale may have been less than perfect. Since there is no way to adjust for such effects, it is necessary to condition conclusions drawn from the subsequent analysis accordingly.

Logistics and Seller Motivations

There are two general types of seller motivation in this data base. As in many investment property sales, the seller often had a less optimistic forecast of the property's future than the buyer. This motivation involves the quality of the individual manager's market research and presents no problems concerning our reliability assessment. A second seller motivation, which is more unusual to this data base, deals with management efficiency. Given operational logistics and the compensation structure of the investment manager, some managers may have tended to sell smaller properties that were not located near their other investments. Since there was usually a large number of potential buyers, even this seller motivation should not substantially affect the appraisal versus sales price comparison.[8]

Capital Improvements between Date of Appraisal and Sales Date

If the real estate investment manager increased investment in the property between the appraisal date and the sales date, the sales price should exceed the appraised value. Assuming a reliable appraisal and only justified and timely capital improvements by the manager, the value difference should be approximately the inflation-adjusted cost of the capital improvements.[9] In this data base all appraised values were adjusted upward by the amount of any capital improvements (not maintenance or normal operating expenses) occurring between the appraisal date and the sales date.[10]

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7. Of the 108 sold properties for which outside appraisals were available, only 14 sold for more than $10 million, one for more than $50 million, and none for more than $100 million. Thus, thin markets should not be a major problem in this sample.

8. There are two other possible seller motivations. If the managers sold only their losers, there might have been a downward bias in the sales prices since the dates of outside appraisals preceded sales dates by as much as 12 months. This would also be true (with a reverse bias) if the managers sold only winners in an effort to impress their pension funds. There is no evidence of either of these motivations.

9. There is some possible slippage between appraised values (forward looking) and accounting entries (historic) for capital improvements. After checking all material capital improvements, the authors believe that the capital improvements added were all physically made after the appraiser's last visual inspection of the property so that no double counting occurred.

10. These adjustments assume that a capital improvement occurs at the midpoint of the quarter in which it is reported.

Changes in the Discount or Capitalization Rate[11]

It is possible that the discount or capitalization rate could change during the interval between the dates of sale and appraisal. This is especially likely both when the preceding appraisal occurred more than one quarter prior to sale and also during periods of interest rate volatility. If the discount or capitalization rate does change during this interval, the sales price would be expected to diverge from the appraised value.

Closing Costs

Since the appraiser's value is not typically adjusted for closing costs (i.e., the opinion of value is more comparable to gross than net selling price), net proceeds received by the sellers might be less than appraised value by the amount of the closing costs. In the sample, closing costs varied substantially but averaged slightly over 2%.[12] Due to the variation in closing costs, net proceeds were used in calculating the difference between sales price and last appraised value. However, since the appraiser would typically not consider closing costs, the average 2% should be considered in interpreting the results of the analysis which follows.

Date of the Last Appraisal

This is the most complicated issue involved in using this data base as a test of appraisal reliability. There is an appraisal every quarter for each property. However, in most cases there is only an outside fee appraisal once a year. The timing and the frequency of outside appraisals varied over the period (1978-1985) so that seasonality effects were both unpredictable and nonstationary. Still, for the majority of the properties (those held in open-ended funds), the managers should have been conscientious about inside appraisals (their staffs are equally well trained),[13] since pension funds could buy in and sell out at the fund's unit value which was based directly on the quarterly appraisals. In the tests that follow we report both the differences from the last appraisal and the last outside appraisal.

Another potential bias in the data results 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, and that the appraiser properly adjusted the opinion of value to reflect this information. Since some closings

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11. While many money managers generally argue that all appraisals should contain discounted cash flow analysis, some appraisers still rely upon the capitalized value of stabilized net operating income.

12. This is the actual average cost of sale, i.e., the difference between gross and net proceeds reported by the investment managers.

13. While levels of experience may vary, the staffs included both MAIs and MBAs and, thus, had similar training to the fee appraisers.

may have been even more than one quarter after the contract signing, we report differences from the last six quarters' appraised values.[14]

Given the length of time between the appraisals and the sales date (now up to six quarters), appraisals are adjusted for inflation during the intervening period. This adjustment assumes mid-quarter sales and appraisals and uses the Consumer Price Index (CPI) as a measure of inflation. Clearly, this CPI adjustment is imperfect since prices move for a series of reasons other than inflation and at different rates in different markets. Still, inflation is a major factor and additional adjustments would be rather small, given the relatively short period of time involved.[15]

TABLE 2

Comparison of Net Sales Prices to Appraised Values
Mean Absolute Difference (in percentages), CPI Adjusted

	N	Last	2nd qtr.	3rd qtr.	4th qtr.	5th qtr.	6th qtr.	Outside
Total	144	7.57	9.34	10.02	10.85	10.86	12.55	9.58
By region								
East	19	5.26	7.28	7.43	8.78	9.14	9.29	6.49
Midwest	33	5.95	9.30	10.44	12.64	11.83	12.11	9.01
South	49	9.60	10.20	11.18	10.97	11.89	13.85	11.52
West	43	7.52	9.31	9.53	10.30	9.61	12.86	9.05
By type								
Apartments	4	22.61	23.06	26.50	25.65	19.32	20.26	23.90
Hotels	3	1.40	6.19	7.12	11.10	11.75	12.87	5.50
Industrial	68	9.91	11.65	11.88	13.23	13.22	14.48	11.73
Office	36	4.11	5.96	7.85	8.33	9.11	10.92	6.14
Retail	33	5.27	6.73	6.76	6.86	7.05	9.46	7.30
By size								
< $2,000,000	60	8.86	10.97	11.05	12.05	12.15	13.83	11.33
$2–10,000,000	70	7.15	8.53	9.02	9.94	9.47	11.29	7.80
> $10,000,000	14	4.15	6.19	10.70	10.35	12.25	13.10	10.60

14. Last appraised value equaled the sales price for three properties. In three cases, the appraised value also equaled sales price two quarters prior to sale.

15. Without the adjustments for inflation, we find that the mean absolute differences are larger in magnitude and increase with every interval between date of sale and appraisal. For example, the mean absolute one quarter and one year differences of the total sample were 7.6% and 10.8% when data was inflated to constant dollars, but were 7.9% and 12.1% when no adjustments for inflation were made.

RESULTS

Table 2 presents the mean absolute percentage differences[16] in the sales price and the appraised values for appraisals one through six quarters preceding the quarter in which the property was sold, as well as for the last outside appraisal. Absolute differences are examined because the use of signed differences would result in an averaging inappropriate in a reliability test.[17] These differences are also broken down by property type, region, and size. In all categories presented in Table 2, the differences are not significantly different from zero at the 5% level when the nonparametric Wilcoxon signed rank test[18] is used to test for differences.

The results are very interesting. For the entire sample, the last appraised value was, on average, over 7.5% (inflation adjusted) different from the sales price, while the last outside appraisal was over 9.5% (inflation adjusted) different. While these differences may be slightly greater than most appraisers would have guessed, the range is even more instructive. The greatest positive and negative differences for the last outside appraisal were +181% and −28% respectively. In fact, 11 sales had an absolute difference of more than 20% from the last outside appraisal. Eliminating these sales, the mean absolute difference from the last outside appraisal drops to around 6%.

It appears that the largest differences were in southern properties, industrial properties (the apartment and hotel samples are too small to be meaningful), and very small properties. However, after removing the major outliers noted in the preceding paragraph, none of the differences within categories remain statistically significant. Thus, it appears that a few appraisals were the major causes of the significant differences within categories and for the whole sample.

This is the expected result, given the extreme outliers noted above. Unfortunately, this means that the confidence interval around any one opinion of value is very large. Since the absolute percentage difference distribution is highly skewed and definitionally nonnormal (lower bound of zero and a mean relatively close to zero), it is not possible to construct standard formal confidence intervals. Still, the ranges and the frequencies reported in Table 3 clearly indicate that any confidence interval would be quite large. Even more disturbing is the failure of the standard deviations to shrink materially as we move from six quarters prior to sale to one quarter prior to sale. The most current appraisals exhibit nearly as great a standard deviation as the more distant appraisals. Additionally, since the

16. The mean absolute percentage difference is average of the absolute values of the differences in sales price and preceding appraised value.

17. If one were concerned with the level of confidence a pension fund might place in the unit value of a portfolio of real estate, then actual or signed differences would be more appropriate.

18. The Wilcoxon signed rank test is a significance test that requires the analyst to make no assumptions about the distribution of the variable in question, such as the assumption of a normal distribution. This test is used because of the observed nonnormality of the distribution of absolute differences.

TABLE 3

Frequency Distribution: Mean Absolute Differences

Difference	Mean	SD	Range		Frequency Distribution			
			Min.	Max.	0–10%	10–20%	20–30%	>30%
1st qtr.	7.50	17.48	0.11	192.22	81.9%	13.2%	2.1%	2.8%
2nd qtr.	9.34	17.35	0.04	184.68	73.2%	17.6%	4.9%	4.2%
3rd qtr.	10.02	17.34	0.02	183.07	70.0%	17.1%	7.9%	5.0%
4th qtr.	10.85	17.39	0.08	180.85	66.4%	21.9%	5.8%	5.8%
5th qtr.	10.86	17.09	0.01	178.27	65.2%	22.7%	8.3%	3.8%
6th qtr.	12.55	18.45	0.31	171.91	59.2%	23.8%	11.5%	5.4%
Outside	9.58	18.60	0.08	180.85	73.1%	16.7%	6.5%	3.7%

magnitude of the mean differences increases for more distant appraisals, it is clear that other forces besides inflation (for which we have adjusted) are causing these differences.

In an effort to determine statistically if nonzero absolute differences were systematically related to the sample breakdowns listed above (i.e., type, region, size), ordinary least squares regressions were run of the form:

$$Y = XB + E$$

where Y is the mean absolute difference, B is a vector of parameter estimates of the vector X of independent variables, and E is a disturbance term. The results of these regressions, presented in Table 4, indicate that not the size or type of the property, region of the country, or year of sale were significant explanatory variables. Interestingly, the dummy variable indicating whether a property was sold in the third quarter was highly significant in explaining the nonzero means in the first regression. This result clearly indicates that the majority of the 11 largest outliers (mean absolute difference greater than 20%) occurred in the third quarter. An examination of the 11 major outliers confirmed this, since 6 of these 11 properties were sold in the third quarter.[19]

19. This concentration in quarter 3 appears to result from chance alone.

TABLE 4

OLS Regression Results*

Dependent variable: mean absolute difference in sales price and last appraisal

Variable	Parameter Estimate	Standard Error	T for HO: Parameter = 0	Prob. > |T|
INTERCEP	4.202885	4.797367	0.876	0.3826
YR78	7.596765	8.877448	0.856	0.3937
YR80	4.143596	9.964811	0.416	0.6782
YR81	-4.186445	9.343266	-0.448	0.6549
YR82	10.971887	6.849403	1.602	0.1116
YR83	1.356125	6.088714	0.223	0.8241
YR84	1.997131	5.838109	0.342	0.7328
HOTEL	-5.334000	10.649212	-0.501	0.6173
APT	16.653312	9.280603	1.794	0.0751
RETAIL	-5.979722	3.715027	-1.610	0.1099
OFFICE	-3.820697	3.777605	-1.011	0.3137
Q2	-1.286401	4.989359	-0.258	0.7969
Q3**	12.264460	4.986533	2.460	0.0152**
Q4	1.368898	4.633668	0.292	0.7681
SALEPR	-1.24342E-07	1.50000E-07	-0.829	0.4087

Dependent variable: mean absolute difference in sales price and last outside appraisal

Variable	Parameter Estimate	Standard Error	T for HO: Parameter = 0	Prob. > |T|
INTERCEP	6.918931	5.516594	1.254	0.2129
YR80	4.484858	14.854448	0.302	0.7634
YR81	-3.051471	11.404971	-0.268	0.7896
YR82	11.035803	8.251043	1.338	0.1843
YR83	0.619687	7.295982	0.085	0.9325
YR84	1.811404	6.667415	0.272	0.7865
HOTEL	-12.194120	19.013798	-0.641	0.5229
APT	18.109900	11.464537	1.580	0.1175
RETAIL	-5.828061	4.511809	-1.292	0.1996
OFFICE	-3.758697	5.063195	-0.742	0.4597
Q2	-3.003571	6.315530	-0.476	0.6355
Q3	12.148697	6.315412	1.924	0.0574
Q4	0.456769	6.005649	0.076	0.9395
SALEPR	-1.28587E-07	1.89262E-07	-0.679	0.4985

*Individual and small group regressions show similar results.
**Statistically significant at the 5% level.

SUMMARY AND CONCLUSIONS

Without the outliers, the mean absolute difference from the last outside appraisal was a respectable 5.9%. Unfortunately, the outliers do exist and the overall results

(over 9.5% average absolute difference) do not indicate a high degree of reliability in the individual commercial appraisal product. (Still, as indicated by the REIT and stock index figures provided in the Appendix, 9% may not be bad in an investment world that exhibits considerable variation over time.)

The outliers are not confined to one property type, location, or size. Since all of these appraisals were reviewed by the investment managers, it is not likely that a methodological error caused the outliers. Thus, it appears that the major appraisal errors concern real estate, not financial or technical aspects. In the outliers, the appraiser appears to have missed major market changes and, at times, even the highest and best use. Certainly, improvements in technique are possible, but an understanding of the underlying land economies appears to be more important.

APPENDIX

The REIT Experience
NAREIT Share Price Index
(January 1972 = 100)

	Index (December)	Price Charge (%)	Dividend Yield (%)	Total Yield (%)	Index of Total Yield
Dec. 1972	103.54	3.54			
Dec. 1973	69.46	−32.91			
Dec. 1974	35.05	−49.54			
Dec. 1975	42.85	22.25			
Dec. 1976	58.46	36.43			58.46
Dec. 1977	64.35	10.08	8.01	18.09	69.03264
Dec. 1978	58.86	−8.53	8.43	−0.10	64.28470
Dec. 1979	69.44	17.97	10.67	28.64	75.72306
Dec. 1980	76.70	10.46	9.68	20.14	83.42179
Dec. 1981	76.53	−0.22	9.48	9.26	83.80116
Dec. 1982	88.88	16.14	9.97	26.11	96.51004
Dec. 1983	102.96	15.84	9.62	25.46	111.5102
Dec. 1984	106.97	3.89	9.20	13.09	116.4423
Mean	73.38846	3.491926	9.3825	17.58573	84.35369
Variance	470.8631	488.2441	0.622693	83.25665	366.5139
SD	21.699938	22.09624	0.789109	9.124508	19.14455

The figures are taken from data compiled by the National Association of REITs. As the dates indicate, these figures primarily describe the 1970s-style REITs (equity, mortgage, and combined), not the 1980s REITs which have investment strategies designed to fit pension fund investors better.

One-year differences in other indexes are reported to provide some insight into long-term market stability. While the comparison is anything but perfect, the change in major stock market indexes from year to year is interesting.

Statistics of Selected Stock Return Indexes 1978-1984

	SP 500	% Return	NYSE	% Return	NASDAQ	% Return
Dec. 1977	98.20	−2.22	53.69	0.02	105.50	11.83
Dec. 1978	96.02	7.28	53.70	8.60	117.98	28.11
Dec. 1979	103.01	15.31	58.32	16.77	151.14	33.88
Dec. 1980	118.78	7.80	68.10	8.69	202.34	−3.21
Dec. 1981	128.04	−6.51	74.02	−6.88	195.84	18.67
Dec. 1982	119.71	34.00	68.93	34.38	232.41	19.87
Dec. 1983	160.41	0.03	92.63	−0.18	278.60	−11.22
Dec. 1984	160.46	—	92.46	—	247.35	—
Mean		7.9555		8.7724		13.990
SD		12.582		12.658		15.058