

Measuring Lodging-Property Performance

A Difficult Task with Imperfect Results

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While no indices currently exist for investors to measure and compare periodic returns on lodging properties—unlike for other classes of real estate—there is a model in the works that may remedy the situation.

A recent nationwide survey of hotel owners reveals that 23 percent of hotels in the United States are owned by institutions.¹ Industry observers agree that the trend away from individual owners to institutional ownership of lodging properties will continue as REITs and lodging-investment companies, such

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¹ "Who Owns America's Hotels," in *Trends in the Hotel Industry* (San Francisco: PKF Consulting, 1993).

as Tishman Hotels and Starwood Capital, become increasingly active in the property market. One implication of this trend is the need for more-reliable information on the returns from investment in lodging properties. Institutional investors currently supplying capital to lodging are doing so without good return-on-investment benchmarks.² Because no indices exist for measuring the total return on investment in lodging properties, investors cannot compare the performance of their properties against a constant quality sample of similar properties. In addition, the absence of a historical record of return-and-risk measures makes portfolio-allocation decisions impossible and may lead to misallocation of capital for investment in lodging properties.

Hotel owners are forced to rely on an assortment of unconnected and incomplete sources of information to assess overall lodging-property performance. The available information includes (1) aggregate data on income, profitability, and other operating statistics produced by research companies and accounting firms, (2) an index of property values produced by a hospitality appraisal firm, (3) aggregate data on hotel-loan originations from a consortium of life-insurance companies, (4) transaction information from the national lodging-brokers association, and (5) an index of hotel values produced at a university.

No one has attempted to link those data sources to measure the two fundamental components of returns—income and capital appreciation—into a unified, total-return index.

Outclassed. The situation is different for other classes of real estate. Since 1978 the National

Council of Real Estate Investment Fiduciaries (NCREIF) has produced total-return indices for various property classes by the geographic regions of the United States on a quarterly basis. The NCREIF index includes an aggregate index and separate indices for office, retail, apartment, and industrial properties. That index is used by real-estate investors as “the industry benchmark”³ for performance evaluations and portfolio-allocation decisions, including acquisitions and dispositions. During the period from 1978 through 1983 the NCREIF index included partial reporting of returns for lodging properties. However, because of the small number of hotels owned by NCREIF members, a constant sample of hotel properties of sufficient size for indexing could not be maintained, and the hotel index was discontinued in 1983.⁴

In the absence of definitive data on lodging-property returns, lodging-property investors are forced to use the aggregate NCREIF index as a proxy for lodging-property returns. Evidence suggests, however, that hotels have substantially higher returns and risk than other real estate.⁵

Given the absence of a compilation of reliable data about lodging-property returns, we set out to develop the best possible index of lodging-property returns that can be

formed from the data now available to investors. Based on the results of that effort, we discovered that an index developed from available data is unsuitable for use in comparative performance measurement and for portfolio-allocation decisions, for reasons that we explain later in detail. Therefore, instead of recommending the use of these data, we identify the appropriate theoretical and empirical specifications required for creating an acceptable index of lodging-property returns.

Measurement of Real-Estate Returns

Holding periods for returns on asset investments are defined over a specific interval of time, such as a year or quarter. The holding-period return comprises the income earned over the period (the income component) plus the change in value of the asset over the period (the capital component).

The holding-period return is defined as:

$$(1) \text{HPR}_{i,t} = \frac{I_{i,t} + (V_{i,t} - V_{i,t-1})}{V_{i,t-1}}$$

where $\text{HPR}_{i,t}$ is the holding-period return in asset i in period t , $I_{i,t}$ is the income from asset i during period t , and $(V_{i,t} - V_{i,t-1})$ is the change in capital value of asset i from period $t-1$ to t . Indices are formed by averaging the holding-period returns (HPRs) on individual assets during each period of the time series.

Both equal-weighting and value-weighting schemes are used. Constructing a reliable return series requires that the index be of consistent quality—that is, the same or similar groups of properties should be included in the index sample each period. Alternatively, advanced statistical techniques must be introduced to maintain consistency.

In the equation above, $I_{i,t}$ is defined in its simplest form as cash available after paying all cash ex-

³Jeffrey D. Fisher, “Alternative Measures of Real Estate Performance: Exploring the Russell-NCREIF Data Base,” *Real Estate Finance*, 10, Fall 1994, p. 79.

⁴The NCREIF index is computed from data on the net income and the change in value of the properties included in the sample. The lodging component reported from 1978 to 1983 included only the income component, limiting its usefulness. A few hotels are still part of the aggregate real-estate-return index, but not enough observations are available to warrant a separate index.

⁵See, for example: Paul M. Firstenberg, Stephen A. Ross, and Randall C. Zisler, “Real Estate: The Whole Story,” *Journal of Portfolio Management*, 14, Spring 1988, pp. 22–34.

²For a discussion of capital-allocation decisions to lodging, see: John B. Corgel, “Capital Flow to Lodging Real Estate,” *Real Estate Finance*, 12, Winter 1990, pp. 13–19.

penses except debt service, income taxes, and the return to equity owners. Although the accounting problems associated with measuring the income component are not trivial, they pale by comparison to the problems of accurately measuring the capital component. Because real-estate assets are neither homogeneous nor are they continuously traded, periodic changes in value must be estimated in one of the following ways:

- (1) *Appraisals to produce an appraisal-based index (ABI)*—Some property owners commission appraisals each quarter. The capital component of the index is estimated from the changes in appraised values for properties appraised that period. The problems with this approach (e.g., smoothing, temporal aggregation, and seasonality) are well-documented elsewhere.⁶
- (2) *Property sales to produce a transaction-based index (TBI)*—During a given period, some properties will be sold and the selling prices can be noted. Unfortunately, the population of properties sold is small relative to the overall population of properties and the number of properties sold is never the same each period. To overcome the constant-quality and constant-quantity problems inherent in building TBIs, hedonic pricing models are esti-

mated each period from the sales that occur. The models are used to predict prices of properties in the constant sample.⁷

As an illustration of the holding-period-return calculation, consider the equation estimated for each property, each quarter in the appraisal-based NCREIF index:

$$(2) \text{HPR}_{i,t} = \frac{\text{NOI}_{i,t} + (V_{i,t} - V_{i,t-1}) + \text{PS}_{i,t} - C_{i,t}}{V_{i,t-1} - .5 C_{i,t} - 5 \text{PS}_{i,t} - .33 \text{NOI}_{i,t}}$$

where $\text{NOI}_{i,t}$ is the net operating income generated by property i during quarter t ; $\text{PS}_{i,t}$ represents any partial sales for property i during quarter t ; and $C_{i,t}$ represents capital improvements made on property i during quarter t . (The equation's other terms were defined earlier.) The denominator contains fractional parts of partial sales, capital improvements, and income to approximate the internal rate of return during the quarter.⁸ The NCREIF index is formed as a value-weighted average of the properties in the index. Constant quality is maintained by examining the performance of the same sample of approximately 1,800 properties, to which only a handful are added or removed each quarter.⁹

An alternative equation for appraisal-based real-estate-return indices was proposed recently that makes the denominator of the index equation consistent with the denominator in the standard holding-

period equation, which was shown above, in equation (1).¹⁰ In this alternative approach, the equation for each property is

$$(3) \frac{\text{NOI}_{i,t} + V_{i,t} - V_{i,t-1} - C_{i,t} + \text{PS}_{i,t}}{V_{i,t-1}}$$

Indexing Using Existing Lodging Data

Presently, no lodging-property index of holding-period returns exists to measure investment performance. Nevertheless, several organizations and firms produce data that provide measures of lodging-property performance. The sources of income data include:

- (1) Smith Travel Research (STR), which manages a large database of lodging-property incomes and publishes operating information monthly in its publication *Lodging Outlook*.
- (2) Smith Travel Research and Arthur Andersen cooperated for several years to produce *The HOST Report* on a semiannual basis. Those reports gave information on aggregate average incomes earned by the industry and by industry segments across geographic regions. Smith Travel Research and Horwath Hospitality Consulting now jointly produce a report with similar data, called the *Lodging Trend Report*.
- (3) PKF Consulting annually produces *Trends in the Hotel Industry*, which is similar in concept to *The HOST Report* and *Lodging Trend Report*.
- (4) The American Council of Life Insurers publishes a quarterly *Survey of Mortgage Commitments on Commercial Properties*. This report summarizes information about the terms of hotel loans committed by major life-

⁶ For a thorough discussion, see, for example: David M. Geltner, "Estimating Market Values from Appraisal Values without Assuming an Efficient Market," *Journal of Real Estate Research*, 8, Summer 1993, pp. 325-335.

⁷ For discussions of the related issues, see: R. Brian Webb, Mike Miles, and David Guilkey, "Transaction-Driven Commercial Real Estate Returns: The Panacea to Asset Allocation Models?," *Journal of the American Real Estate and Urban Economics Association*, 20, Summer 1992, pp. 325-357; and Jeffrey D. Fisher, David M. Geltner, and R. Brian Webb, "Value Indices of Commercial Real Estate: A Comparison of Index Construction Models," *Journal of Real Estate Finance and Economics*, 9, 1994, pp. 137-164. A hedonic model for lodging properties appears in: John B. Corgel and Jan A. deRoos, "Pure Price Changes of Lodging Properties," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 33, No. 2 (April 1992), pp. 70-77.

⁸ For additional information, see: S. Michael Giliberto, "The Inside Story on Rates of Return," *Real Estate Finance*, 11, Spring 1994, pp. 51-57.

⁹ For additional information, see: Joseph B. Diehl, "The Russell-NCREIF Property Indices: Institutional Real Estate Performance Benchmarks," *Journal of Real Estate Literature*, 1, Jan. 1993, pp. 95-103.

¹⁰ Michael S. Young, David M. Geltner, Willard McIntosh, and Douglas M. Poutasse, "Understanding Equity Real Estate Performance," *Real Estate Review*, 25, Winter 1996, pp. 4-16.

insurance companies, including capitalization rates.

The sources of data on the capital component include:

- (1) Hotel and Motel Brokers Association of America's *Transactions*, which contains information on sales of lodging properties each month.
- (2) The Cornell University School of Hotel Administration produces a hedonic index of hotel values based on sales of individual hotels. Data for the index come from a variety of sources, including brokerage companies and the *Hospitality Market Data Exchange*, which is assembled by Hospitality Valuation Services (discussed next).
- (3) Hospitality Valuation Services annually produces the *Hotel Valuation Index (HVI)*, using operating information furnished by Smith Travel Research and capitalization rates. The *HVI* presents value indices based on capitalized incomes. Hospitality Valuation Services also maintains a database on lodging-property transactions called the *Hospitality Market Data Exchange*.

Building the Best Index

Given the publicly available data about lodging-property values and investments, we decided to build the best possible index of lodging-property returns over an extended period. By "best possible index" we mean the most institutionally, academically, and statistically defensible index. Another objective we had was to make this index as compatible as possible with the NCREIF index. We computed income returns from the sources presented above, then combined those results with the returns calculated from the available data on capital components. In the paragraphs to follow, the reasons for selecting particular

data series are discussed and the methodology used to create the index is described.

Perhaps the largest and most comprehensive database on lodging-property performance is collected and managed by Smith Travel Research. Each month, data on room rates and occupancies are published in *Lodging Outlook* for over 50 U.S. metropolitan markets. Unfortunately, no data on net incomes are published.

Likewise, data from STR's *The HOST Report*¹¹ are not well suited for a property index because the definition used by STR of "income before fixed charges" (IBFC) is inconsistent with the standard definition of net operating income (NOI). Specifically, IBFC is a measure of periodic income before deduction of property taxes, property insurance, and equipment rental. The procedures followed from the NCREIF index and most non-hotel real estate, for example, use a NOI measure that includes these expenses.

The data in PKF's *Trends in the Hospitality Industry* conform to the standard definition of NOI and hence are an acceptable source of periodic lodging-industry income. Those reports present an aggregate income statement for all establishments in the sample. Maintenance of a constant quality sample is not addressed by PKF in assembling its data, however, and thus it appears that each annual report contains a different sample. Because of the different numbers of properties and rooms each year, income must be calculated on a per-room basis for a time-series comparison. The total number of properties varies from 764 in 1984 to 2,100 in 1993, and the average size of the properties in

each annual sample varies from 221 to 265 rooms.

Several alternative databases are also available to measure the capital component of lodging-property returns. For example, the *Transactions* database contains 100 to 200 lodging property sales each year, but this source dates back only a few years.

The ACLI publication includes a comprehensive breakdown of the terms committed on lodging-property mortgage loans from the 1950s to the present. Each quarterly report contains the number of loans committed, the total value of loans committed, the value of hotel loans as a percentage of all loans committed, and weighted averages of the contract interest rate, capitalization rate, lender yield, debt-coverage ratio, loan-to-value ratio, and loan maturity. The most useful item for return indexing is the capitalization rate because it provides direct evidence of the relationship between income and value. No attempt is made by ACLI to control the reported series for constant quality among the contributing institutions. The organization simply reports information on loans committed by life-insurance companies during a particular quarter.

The *HVI* is based on the "income approach" to value and has not been produced on a regular schedule. Both market-wide occupancy and average-rate data are gathered for 23 individual U.S. markets to estimate total revenue in each market. Operating data from each of the 23 markets are then used to impute net operating income for those markets. Net income is capitalized to estimate total market value for lodging properties in each of the 23 markets. The U.S. average was set to 1.00 in 1986, the first year of publication, with local markets having values greater or lower than 1.00. For instance, the high and low in 1986 were 3.3571 for Honolulu and

¹¹ This series succeeds *U.S. Lodging Industry* prepared by the former Laventhol and Horwath. There is a gap between the two series in 1989.

Exhibit 1
Published income and capital-return data

Year	Income Component				Capital Component					
	HOST ¹		PKF ²		ACL ³		HVI ⁴		Cornell Index ⁵	
	IBFC per Room	Percent Change	IBFC per Room	Percent Change	Cap. Rate	Percent Change	Index Value	Percent Change	Index Value	Percent Change
1984	\$ 5,014	2.1%	\$ 5,399	11.8%	11.8%	3.3%	—	—	100.00	—
1985	\$ 4,875	-2.8%	\$ 5,425	0.5%	11.5%	2.5%	—	—	89.64	-10.4%
1986	\$ 4,591	-5.8%	\$ 5,169	4.7%	9.9%	13.9%	100.00	—	89.81	0.2%
1987	\$ 4,719	2.8%	\$ 5,353	3.6%	11.5%	-16.2%	94.64	-5.4%	68.06	-24.2%
1988	\$ 5,079	7.6%	\$ 5,698	6.4%	10.5%	8.3%	105.36	11.3%	63.62	-6.5%
1989	\$ 5,050	-0.6%	\$ 5,936	4.2%	9.2%	12.7%	112.50	6.8%	60.09	-5.5%
1990	\$ 5,012	-0.8%	\$ 6,031	1.6%	10.0%	-8.7%	106.88	-5.0%	57.41	-4.5%
1991	\$ 5,418	8.1%	\$ 5,707	-5.4%	9.1%	9.0%	91.91	-14.0%	41.75	-27.3%
1992	\$ 6,181	14.1%	\$ 6,433	12.7%	9.5%	-4.4%	99.27	8.0%	40.92	-2.0%
1993	\$ 6,558	6.1%	\$ 6,697	4.1%	11.4%	-20.0%	114.16	15.0%	37.60	-8.1%
Avg.	\$ 5,250	3.1%	\$ 5,785	4.4%	10.4%	0.0%	N/A	2.4%	N/A	-9.8%

¹ Income before fixed charges (IBFC) per available room does not include deductions for property taxes, insurance, and rentals. The 1989 IBFC figure is estimated because the L&H series ended in 1988 and the *HOST* series started in 1990.

² IBFC per available room is equivalent to net operating income with the reserve for replacement deducted.

³ Implied capitalization rate from prevailing mortgage terms.

⁴ Based on capitalized income.

⁵ Based on a hedonic index of the sales prices of lodging properties.

0.5357 for Denver. The reported U.S. average index for the period 1986–1990 may be used directly for index construction, and the U.S. index level for 1991–1993 may be computed from reported percentage changes.

Market-wide revenue and income data bring some stability to the index, but it isn't clear whether the *HVI* is of consistent quality.

The Cornell Hotel School's hedonic index is produced from a database of over 1,400 sales transactions from 1985 to 1994. This index measures the change in transaction prices in a precise and statistically defensible manner. The index is a quarterly, constant-quality index of lodging-property values based on transaction prices. Details about the construction of the index are presented elsewhere.¹²

¹² See: John B. Corgel and Jan A. deRoos, "Buying High and Selling Low in the Lodging Property Market," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 35, No. 6 (Dec. 1994), pp. 33–38; Corgel and deRoos, "The ADR Rule-of-Thumb as Predictor of Lodging Property Values," *International Journal of Hospitality Management*, Vol. 12, No. 4 (1994), pp. 353–365; and Corgel and deRoos (1992).

Results

A summary of the income–return and capital–return data is presented in Exhibit 1. All results are based on nominal returns. A comparison of the *HOST* series and PKF series indicates that the income levels track closely together. An examination of the percent-change column reveals another story. The correlation between the percent-change columns is only 26 percent, a result that is not statistically different from zero. The PKF income measure is increasing in all years except 1991, showing a compound rate of change of 2.2 percent. The *HOST* series is more volatile, but shows an overall compound rate of change of 2.7 percent. Because of the lack of agreement between the two income series and because the *HOST* series is not consistent with a standard definition of net income, the *HOST* series is excluded.

Note that the three capital–component measures behave differently and do not move in unison. Most striking is the difference between the *HVI*, which has a value in 1993 that is 14 percent above the 1986 value, and the Cornell Index, which has a value in 1993 that is 58 percent below the 1986 value.

The percent change of total return cannot be calculated by simply adding the respective income and value columns in Exhibit 1 because the percent change of the income component is calculated using last year's income, not property value, in the denominator.

The total returns are calculated in the following manner. A value of \$50,000 is established as the 1983 value of a typical room. This corresponds to an assumed capitalization rate of 9.7 percent. Next, the 1983 value is adjusted by the percent

Exhibit 2**End-of-year values for each capital component**

Year	ACLI	HVI	Cornell
1983	\$50,000		
1984	\$51,650		
1985	\$52,941		\$52,941
1986	\$60,300	\$60,300	\$53,047
1987	\$50,531	\$57,044	\$40,210
1988	\$54,726	\$63,490	\$37,596
1989	\$61,676	\$67,807	\$35,528
1990	\$56,310	\$64,417	\$33,930
1991	\$61,378	\$55,398	\$24,667
1992	\$58,677	\$59,830	\$24,173
1993	\$46,942	\$68,805	\$22,215

Exhibit 3**Total-return indexes using the PKF income series and the three capital components**

Year	Total Return			Russell-NCREIF Index
	PKF & ACLI	PKF & HVI	PKF & Cornell	
1984	14.1%			12.5%
1985	13.0%			9.8%
1986	23.7%		10.0%	6.5%
1987	-7.3%	3.5%	-14.1%	5.6%
1988	19.6%	21.3%	7.7%	6.9%
1989	23.5%	16.1%	10.3%	6.1%
1990	1.1%	3.9%	12.5%	1.5%
1991	19.1%	-5.1%	-10.5%	-6.1%
1992	6.1%	19.6%	24.1%	-5.2%
1993	-8.6%	26.2%	19.6%	0.9%
<i>Average</i>	10.4%	12.2%	7.4%	3.9%

change in the value component to produce a 1984 value. The cycle is repeated each year for the ACLI, HVI, and Cornell indices. End-of-year adjusted values are presented in Exhibit 2. The capital return is computed by dividing the current year's income per room by the previous-year value. The capital return is added to the income component to form the total-return index. Three indices are produced: one for each of the three value series, combined with the PKF income data. The results are presented in Exhibit 3, along with the total return to real estate published by NCREIF for comparison purposes.

The total-return series that we produce tells three remarkably different stories about lodging-property returns over the past decade. None has a higher claim on truth than another, and hence it is difficult to present conclusions about the lodging industry's total return over the decade. Two of the three capital-component measures are based directly on income (i.e., the ACLI cap-rate series and the HVI). Only the Cornell index is a transaction-based index.

One conclusion is that lodging-property returns appear higher than

returns of other classes of real estate as measured by the NCREIF index. This conclusion is based on a comparison of the average returns in Exhibit 3. In addition, lodging-property returns appear more volatile than those segments reported by the NCREIF. Care must be exercised in drawing this conclusion, however, as none of the hospitality indices is directly comparable to the appraisal-based methodology of the NCREIF index.

Recommendations for a Reliable Index

The just-presented proxies for a truly useful lodging-property index are seriously flawed. To form either a reliable appraisal-based or transaction-based index, additional data and the introduction of alternative methodologies are needed, as we are about to explain. We've organized our recommendations for new data into the following categories: comparability, sampling and data collection, income-component requirements, and capital-component requirements.

Comparability. Early in the development of a lodging-property-return index, decisions must be reached about comparability to the NCREIF index. Strict comparabil-

Exhibit 4
Sampling matrix*

	Lodging-market segment				Total
	Segment 1	Segment 2	Segment 3	Segment 4	
Area 1	Cell 11	Cell 12	Cell 13	Cell 14	Cell 15
Area 2	Cell 21	Cell 22	Cell 23	Cell 24	Cell 25
Area 3	Cell 31	Cell 32	Cell 33	Cell 34	Cell 35
Area 4	Cell 41	Cell 42	Cell 43	Cell 44	Cell 45
Total	Cell 51	Cell 52	Cell 53	Cell 54	Cell 55

*A cell in the matrix would contain the number of properties in the sample for a particular area and market segment.

ity means that the lodging-property index is appraisal-based, is produced quarterly, is geographically stratified, and involves a constant-quality sample of properties. Armed with an NCREIF-comparable index, lodging-property owners are able to relate the returns on their properties to the benchmark return from investments in other types of real estate (e.g., apartment, retail, office, industrial) within regions (e.g., east, south, midwest, west) and, of course, to the benchmark returns for lodging-property investments. Because many institutional owners hold portfolios of real estate that include different types of properties, an NCREIF-comparable index has considerable appeal.

An opposing viewpoint suggests producing a lodging-property-return index that is not constrained by the structure and procedures associated with the NCREIF index. Although an important dimension of comparability is lost by departing from the form represented by the NCREIF index, measurement-efficiency gains may be realized. A clear departure would be to pursue a transaction-based index instead of an appraisal-based index. A TBI approach avoids the problems associated with an ABI approach, but a new set of problems is encountered.¹³

¹³ See: Webb, Miles, and Guilkey; Fisher, Geltner, and Webb; and Corgel and deRoos (1992).

Sampling and data collection.

Determinations must be made about comprehensiveness of the index with respect to lodging-market segments and geographic areas. Exhibit 4 shows a sampling matrix using a four-area by four-market-segment design. Each cell would contain the number of properties out of the entire sample that are in a given market segment in a given area (e.g., luxury hotels in the southwest). The first cell that must be filled is cell number 55 (bottom right-hand corner in Exhibit 4). If the total population of lodging properties is known and an error-tolerance level is set, then a standard sample-size determination formula may be used to establish a target level for the total sample. If the target level is unrealistic—perhaps because of budget constraints and data-collection problems—the error-tolerance level may be reconsidered. Filling in sample sizes for the remaining cells is based on minimum-sample-size needs (e.g., 30 properties or greater) and data availability. The success and efficiency of the data-collection effort are directly related to development of strong industry contacts and sound data-management practices.

Income component. Several decisions must be made about how income flows are measured and reported. The *Uniform System of Accounts* should be followed closely, but in some instances, the accounting practices of NCREIF and the real-estate industry may be adopted.¹⁴

Capital component. Separate policies and specifications are needed for an ABI and a TBI. It is doubtful that sufficient appraisals can be obtained on an ongoing basis to produce an ABI that is stratified by area and market segments. Most properties in the NCREIF index are con-

¹⁴ *A Uniform System of Accounts for Hotels* (New York: American Hotel & Motel Association, 1986).

trolled by NCREIF members and owned by pension clients and partners. The fiduciary responsibilities dictated by ERISA have led to a system of regular reporting of appraised values for pension-owned properties. Lodging-property ownership is far less concentrated in pension funds than is other types of real estate. Therefore, appraisals either are not performed at all or are performed according to an irregular schedule by owners and managers.

Overcoming the problem of incomplete appraisal information is the greatest challenge in producing an ABI. The problem is so acute in the case of developing a lodging-property index that alternative procedures must be followed. One approach is self-reporting of current values by owners.¹⁵ Implementing a system of self reporting, however, would involve considerable trust between the property owners and managers and those responsible for producing the index. Another approach is to form a committee of experts to review property data and then provide an opinion of value for all properties each period.

Our previous work indicates that a transaction-based, lodging-property price index is possible, with the capital return measured with a hedonic model.¹⁶ The data collection, analysis, and expense necessary to create and maintain a hedonic index are substantial.

What the Industry Really Needs

Total-return indices for lodging properties developed from publicly available data are unsuitable for use by the investment community. The problems include reporting inconsistency, absence of quarterly data,

unreliability of capital-return information, and the lack of a constant-quality property sample.

Even though several different indices produced from published data are presented in this article, we conclude that those indices are not particularly useful as benchmark-return or portfolio-allocation tools. Evidence suggests that lodging-property returns are higher and more volatile than returns to other types of real estate, indicating the need for a reliable returns measure, distinct from available aggregate measures for other property types, such as that provided by the NCREIF Index.

As explained above, an appropriately designed, reliable lodging-property-return index will achieve the following goals:

- The index should be comparable to the NCREIF Index.
- The index should have a large enough sample to be defensible, but not so large as to pose a reporting burden on the industry.
- The index should be segmented into the property classes and geographic regions most useful to the industry.

Progress thus far. The findings of this study along with a trial run of an appraisal-based index for lodging properties were presented to the Industry Real Estate Financing Advisory Council (IREFAC) of the American Hotel and Motel Association (AH&MA) in November 1994. The AH&MA agreed to fund the development of the AH&MA's IREFAC *Lodging Property Index* (LPI) at the Cornell University School of Hotel Administration. The inaugural report covering the fourth-quarter 1995 returns for lodging properties was unveiled at the New York University Hotel Investment Conference in June 1996, and the *Cornell Hotel and Restaurant Administration Quarterly* will publish future reports. **CQ**

The Lodging Property Index, an appraisal-based index for lodging properties that is being developed at Cornell with financial support from the AH&MA, will be presented periodically in the *Cornell Hotel and Restaurant Administration Quarterly*.

¹⁵ For background on the self-reporting concept, also called "current-value reporting," see: James C. Kafes, "Why Provide Current Value Information?," *The REIT Report*, 11, Fall 1991.

¹⁶ Young, Geltner, McIntosh, and Poutasse, *op. cit.*