Market Value and the Valuation Process

Hotels and motels are income-producing, investment properties which are periodically bought, sold, financed, refinanced, condemned, assessed, and bequeathed. All of these activities usually require a professional appraisal.

A number of definitions of market value have been formed by the various authorities and entities involved in the practice of appraisal. The Appraisal Institute defines market value as follows:

The most probable price, as of a specified date, in cash, or in terms equivalent to cash, or in other precisely revealed terms for which the specified property rights should sell after reasonable market exposure in a competitive market under all conditions requi-

site to a fair sale, with the buyer and seller each acting prudently, knowledgeably, and

for self-interest, and assuming that neither is under undue duress.[1]

The Uniform Standards of Professional Appraisal Practice (USPAP) defines market

value as follows:

The most probable price,

(i)   in terms of cash; or

(ii)   in terms of financial arrangements equivalent to cash; or

(iii)   in such other terms as may be precisely defined; if an estimate of

value is based on non-market financing or financing with unusual

conditions or incentives, the terms of such financing must be

clearly set forth, their contributions to or negative influence on

value must be described and estimated, and the market data

supporting the valuation estimate must be described and

explained.

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[1] Appraisal Institute. *The Dictionary of Real Estate Appraisal*, 3rd ed. (Chicago: Author, 1993),

The following definition has been agreed upon by the agencies that regulate federal financial institutions in the United States:

The most probable price which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus. Implicit in this definition is the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:

1. buyer and seller are typically motivated;

2. both parties are well informed or well advised, and acting in what they consider their own best interests;

3. a reasonable time is allowed for exposure in the open market;

4. payment is made in terms of cash in U.S. dollars or in terms of financial arrangements comparable thereto; and the price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale.[2]

222.

The market value of a lodging facility may include the value of its various

components, which consists of land; improvements (building); furniture, fix-

tures, and equipment; inventories; working capital; and any business value.

Market value is estimated by applying the valuation process, and the opinion

of value is usually communicated in a written appraisal report.

In appraising the market value of real estate, the appraiser considers three

approaches:

1. The cost approach, which is sometimes referred to as the summation approach.

2. The sales comparison approach, which may be called the direct sales or market

data approach.

3. The income capitalization approach, which is sometimes referred to as the

income approach.

Cost Approach

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[2] *Federal Register*, Vol. 55, No. 165, August 24, 1990: 34696.

The cost approach is based on the assumption that an informed purchaser

will pay no more for a property than the cost of producing a substitute prop-

erty with equal utility. When the cost approach is applied, market value is

estimated by calculating the current cost of replacing the subject improve-

ments and subtracting an appropriate amount for depreciation.

The cost of replacing a property is generally estimated on a square-foot basis

using figures from a construction cost manual published by a recognized cost

reporting service. The value of the land as if vacant and available for devel-

opment is then added to the depreciated replacement cost estimate to yield

the estimate of value.

Depreciation is defined as a loss in value caused by one or more of the fol-

lowing factors:

- Physical deterioration-the physical wearing out of the property

- Functional obsolescence-a lack of desirability in the layout, style, and design of the property as compared to a new property serving the same function

- External obsolescence-a loss in value from causes outside the property itself

Appraisal literature recommends using the cost approach for new properties, which have not been affected by the various forms of depreciation, and for unique or specialized improvements such as schools and libraries that have no comparable market or income potential.

The cost approach is seldom used to value existing hotels and motels because lodging facilities are particularly vulnerable to physical deterioration, functional changes, and uncontrollable external factors. Sometimes a hotel can suffer from functional and external obsolescence before its construction is completed. As the building and other improvements age and depreciate, the resultant loss in value becomes difficult to quantify. Estimating the impact of even minor forms of obsolescence may require insupportable judgments that undermine the credibility of the cost approach.

A more significant reason why this approach is not applied to hotels and mo-

tels is that its underlying assumptions do not reflect the investment rationale

of typical hostelry buyers. Lodging facilities are income-producing properties

that are purchased to realize future profits. Replacement or reproduction cost

has little bearing on an investment decision when the buyer is primarily con-

cerned with the potential return on equity.

The cost approach can be useful, however, in determining the feasibility of a

proposed hotel. When applied in conjunction with the income capitalization

approach, the cost approach can verify a project's economic feasibility. If the

value obtained by applying the income capitalization approach is equal to or

greater than the replacement cost plus the land value, the project is usually

considered economically feasible. If, however, the value estimated by the in-

come capitalization approach is less than value derived by the cost approach,

the investors should scrap the project, reduce capital costs, or lower their de-

sired return. Moreover, if this is the case, an additional equity investment

may be needed to secure sufficient financing. The data used to estimate the

replacement cost of property improvements should come from a qualified

source such as an experienced contractor, architect, or engineer, or from a

construction cost manual. Land value is established by analyzing sales of

comparable parcels or by capitalizing the ground rental.

Table 6.1 shows ranges of typical replacement costs, land values, and soft

costs for luxury, standard, and economy accommodations.

Estimating Hotel Land Values

Hotel appraisers are sometimes asked to estimate the value of a total proper-

ty and then calculate a separate land value. To calculate land value the ap-

praiser investigates the market to find recent transfers of vacant parcels with

similar acreage, street frontage, location, and zoning. Any differences be-

tween the comparable property and the subject are then adjusted on a grid.

In practice, this process can be difficult due to the lack of sufficiently compa-

rable vacant lands sales data and the complexity of estimating the necessary

adjustments. An alternative approach is the comparable ground lease meth-

od, based on the premise that the value of land is tied directly to its capacity

to generate income at its highest and best use.

Each year a number of hotel transactions are structured using ground leases.

Typical rental terms vary from simple flat payments with escalation adjust-

ments to formulae based entirely on gross revenues. To quantify the income

attributed to the land alone, the net rental using a percentage of gross reve-

nue is the logical choice.

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CASE STUDY

Land Value Estimation

In the following example, the comparable ground lease procedure is used to estimate

the land value of the Sheraton in its third year of operation. The following data are

given:

Projected rooms revenue	$11,158,000
Projected food revenue	4,146,000
Projected beverage revenue	1,119,000

Ground leases for eight hotels similar to the subject were found; their rental formulae are set forth in Table C.S.6.1. The estimated ground rental for the subject is calculated using the comparable formulae and the subject's projected revenues.

If all the comparable formulae are assumed to be equally similar to the subject, the average ground rent of $494,573 would be a supportable estimate of the income attributed to the land. The value of the land can then be calculated by capitalizing the subject's estimated ground rent by an appropriate land capitalization rate.

Ground Rent		Capitalization Rate		Land Value
$494,573	÷	.085	=	$5,818,506
			rounded	$5,800,000

This land value estimate is approximately 17% of the total value estimate for the pro-

posed Sheraton and is within the 10% to 20% range considered normal for a hotel.

The ground lease approach assumes that the hotel represents the highest and best

use of the land.

For a more detailed explanation of cost approach methodologies, the reader

is directed to the most recent edition of *The Appraisal of Real Estate*, which is

published by the Appraisal Institute. This text devotes a chapter to the valua-

tion of real estate via the cost approach. The methods for estimation of the

various forms of depreciation described in this text are applicable to hotels.

Sales Comparison Approach

The sales comparison approach is based on the assumption that an informed purchaser will pay no more for a property than the cost of acquiring an existing property with equal utility. When this approach is applied, market value is estimated by comparing the sale prices of recent transactions involving properties similar to the property being appraised. Dissimilarities are resolved with appropriate adjustments. These differences may pertain to transaction characteristics such as property rights conveyed, financing terms, conditions of sale, and market conditions, as well as property characteristics such as location, physical condition, scope of facilities, and market orientation.

The reliability of the sales comparison approach depends on three factors:

- Availability of timely, comparable sales data

- Verification of sales data

- Degree of comparability, i.e., the extent of adjustment needed to account for the differences between the subject and the comparable property.

The sales comparison approach often provides highly supportable value estimates for homogeneous properties such as vacant land and single-family homes when the adjustments are few and relatively simple to compute. For larger, more complex properties such as office buildings, shopping centers, and hotels, the required adjustments are often numerous and difficult to estimate.

For example, assume an appraiser is valuing a motel property by comparing it with a similar motel across the street which was sold last year. In this case the subject differs from the comparable in the following ways:

- Seller will take back purchase-money financing

- Different franchise affiliation

- Better visibility

- More parking facilities

- Larger restaurant and smaller lounge

- Enclosed swimming pool

- Higher-grade furnishings

- Two vanity sinks per guest room

These are just a few of the many potential differences for which adjustments

will be needed to make the indicated sale price of the comparable reflect the

market value of the subject. In appraising lodging facilities, the adjustment

process is often difficult and generally unsupported by market data. The

market-derived capitalization rates that are sometimes used by appraisers are

susceptible to the same shortcomings inherent in the sales comparison ap-

proach. In fact the reliability of the income capitalization approach can be

substantially reduced when capitalization rates obtained from unsupported

market data are used. This practice not only weakens the final estimate of

value, but also ignores the typical investment analysis procedures employed

by hotel purchasers.

Although the sales comparison approach is seldom given substantial weight

in a hotel appraisal, it can be used to bracket a value or to check the value de-

rived by the income capitalization approach. For example, assume an appraiser is valuing a mid-rate commercial hotel. The appraiser has researched the market and discovered two recent sales. One sale involved a first-class hotel with a value of $120,000 per room. The other sale was of a mid-rate hotel that was obviously less attractive than the property being appraised; it had a value of $85,000 per room.

Although a value estimate based on these data would be difficult to support, a range of values within which the final estimate should fall has been established. If the income capitalization approach results in a value indication that is outside this range, the appraiser knows that the data must be re-evaluated. Occasionally appraisers may apply a gross income multiplier or rooms revenue multiplier in the sales comparison approach. If this practice reflects the actions of the market, it can be considered in an appraisal.

Lodging DataBank by HVS International

As in all appraisals, the market must be researched to locate comparable sales

with which to support the market value estimate. To help appraisers identify

comparable sales of hotels and motels, HVS International has established the

Lodging DataBank (LDB), a central clearinghouse of information relating to

hotel and motel transactions. The LDB is developed to house facilities infor-

mation, sales transactions, and development statistics, along with market in-

formation and company research pertaining to the hospitality industry. The

LDB has compiled data on thousands of hotel sales throughout the United

States. The data are categorized by property name, city, and state, and contain

pertinent information relating to each transaction.

In order to provide a measure of lodging sales activity, HVS International

publishes the "Hotel Transactions Survey" each year. This survey tracks ho-

tel sales throughout the United States with a sales price over $10 million. Ta-

ble 6.2 identifies the major hotel sales activity that took place in the United

States during the 1990s.

In 1990, the number of transactions and the average price per room were both

strong. During the recession of the early 1990s, the number of major hotel

transactions declined. Debt and equity financing was unavailable; owners

were reluctant to sell at deflated values; and large, full-service hotels were

out of favor when compared to more profitable limited-service properties.

The picture changed radically in 1994, when the number of transactions more

than doubled from the previous year. Full-service hotels were in demand

again, and buyers were attracted to the upside potential of acquiring hotels

priced at discounts to their replacement costs. By 1998, the average sale price

per room returned to $136,000. In 1999, while hotel sales activity dropped by

more than 50% from the previous year, the average price per room continued

to climb, achieving a level of $142,000 per room, the highest point of the dec-

ade.

The decline in the number of major hotel sales is a result of several factors in

the marketplace. During the buying frenzy between 1995 and 1998, real es-

tate investment trusts (REITs) dominated the acquisitions market. However,

with new legislation, coupled with waning stock prices, the buying power of

REITs has decreased considerably. Moreover, lenders have become more hes-

itant about financing the purchase of lodging facilities. The diminishing

RevPAR growth, along with new supply outpacing demand growth, has

caused lending institutions to be more cautious in their due diligence pro-

cesses. Furthermore, whereas buyers are currently available, the prices being

offered by sellers often make deals prohibitive. While there are instances

where buyers are willing to pay a premium to gain a key asset in a major

market, this is not typically the case.

Hotel Valuation Index

A second source of hotel market data is the Hotel Valuation Index (HVI), a

sophisticated valuation benchmark showing the indexed market value of a

typical hotel. The HVI is tracked on the basis of 47 individual market areas,

the United States as a whole, and four rate categories. The index is based on

actual occupancy and room rate data supplied by Smith Travel Research,

along with local operating performance, projections of supply and demand,

and capitalization rates derived by HVS International. The HVI, which was

initiated by HVS International in 1986, reflects trends in market value over time, and assumes a willing buyer and a willing seller rather than a distressed, liquidation-type transaction. While the Lodging DataBank records the actual price paid for a hotel unadjusted for non-market factors such as favorable financing and unusual motivations that could impact the sale price, the HVI represents the property's value under the standard definition of market value.

The HVI assigns the greatest weight to the income capitalization approach, with secondary support provided by the sales comparison and cost approaches. Appraisers recognize that hotel values change over time due to differing earnings expectations and capitalization rates. The HVI was designed to illustrate these changes and to quantify the amount of variance attributable to movements in earnings and the costs of debt and equity capital. The index is intended to represent HVS International's opinion and may not represent actual value trends.

Table 6.3 shows the historical hotel valuation index results for the 47 market

areas between 1987 and 1999, and the projected hotel valuation index results

between 2000 and 2003. The markets are presented in alphabetical order.

Table 6.4 shows the annual percentage change in each market, over the histor-

ical and projected periods.

As indicated in Table 6.4, the overall change in value for a typical American

hotel increased by an estimated 24.2% in 1989, declined significantly in 1990

and 1991, then began a streak of value appreciation that continued through

1999. The rate of growth was minimal in 1992, but exceeded 20% in each year

between 1994 and 1997. Restricted availability of capital contributed to the

rapid deceleration in value growth in 1998 and 1999, despite the fact that na-

tional lodging markets continued to experience positive RevPAR growth.

Through 2003, national hotel values are expected to continue to appreciate at

modest levels.

The HVI is an indexed value based on the 1987 value of a typical hotel in the

United States (1987 = 1.000). Each market area is indexed from this base and

assigned a number showing the value relationship of that market area to the

base. For example, in 1987 the index for Miami was 1.7067, which means that

the value of a hotel in Miami was approximately 71% higher than that of a

similar hotel situated elsewhere in the United States. A more meaningful

comparison is indicated by the value difference between hotels in two cities.

For example, assume a hotel in Tampa sold in 1997 for $95,000 per room. In

order to calculate what a similar hotel in Orlando would probably command

in 1999, the 1999 HVI for Orlando may be divided by the 1997 HVI for Tam-

pa.

1999 Orlando		1997 Tampa		Adjustment Factor
3.2028	÷	1.6919	=	1.893

Then, the 1997 Tampa sale price of $95,000 per room is multiplied by 1.893 to

yield the estimated 1999 sale price for the Orlando hotel.

$95,000 x 1.893 = $180,000 (rounded)

Table 6.5 identifies the top ten markets identified based on the 1999 HVI estimates. Each market's index is then expressed as a ratio to the national average. As indicated, New York City leads the nation with an index that is approximate five times the national average. Among the top ten markets, Las Vegas and Washington, DC are the only non-coastal geographic areas. Generally, the northeastern United States and California appear to be the regions with the highest values.

Table 6.6 identifies the ten markets that grew at the fastest rates between 1991 and 1999, as well as the ten markets with the smallest (or negative) rates of growth over this period. Long Island hotel values appreciated at the fastest rate over the decade, followed by Philadelphia and Detroit. A highly restrictive development environment helped contribute to the Long Island value gains. Between 1991 and 1999, the weakest market areas were Albuquerque, Oahu, and Salt Lake City.

Table 6.7 has the same format as Table 6.6, but it pertains to projected changes

in hotel values between 1999 and 2003. California and Florida hotels appear

to be particularly well-positioned for value growth in the near term, while the

outlook for Salt Lake City, Indianapolis, and Albuquerque is significantly less

positive.

HVI Versus Replacement Cost

The U.S. hotel market can also be segmented by class or rate categories. An

interesting aspect of the wave of hotel construction that commenced in the

last half of the late 1990s was that it occurred by rate category. First, building

commenced in the budget segment, followed by the economy segment. As

the decade ends, the upscale and luxury segments are the focus of new con-

struction activity. When overbuilding occurred during the 1980s, all seg-

ments of hotels were developed concurrently.

Hotels are classified by rate categories, which is based on the quality of facilities and

the level or class of service. The U.S. hotel industry uses a number of different con-

ventions to define these rate categories. In tracking hotel values, HVS International

classifies the major hotel chains into six rate categories, including 1) Deluxe, 2) Luxu-

ry, 3) Upscale, 4) Mid-Scale without Food & Beverage, 5) Economy, and 6) Budget.

HVS International has estimated the respective values per room for these six rate

categories, as well as the estimated replacement cost. For the years 1986 to 1999,

the values are based on actual occupancies and room rates; for the years 2000 to

2003, projected data was utilized. To illustrate this data, several graphs have been

developed showing value per room and the replacement cost. Graphs 6.1 through

6.6 show historic value and cost data from 1986 to 1999, along with projected data

to the year 2003. The boxes represent the market value per room; the diamonds

show the replacement cost per room.

New hotel development generally occurs when a market exhibits positive feasibility.

A hotel project is considered feasible when its market value upon completion is

higher than its replacement cost. Negative feasibility results when a new hotel's

market value is lower than its replacement cost. The market value and replacement

cost graphs illustrate the points in time when feasibility was either positive or

negative. In addition, these graphs identify when new hotel development is likely to

commence and when it will start to decline. As the market value line moves upward

and passes through the replacement cost line, new hotel projects become feasible,

lenders and investors gain interest, and development begins. Savvy hotel

developers will anticipate this trend and start their projects before the two lines

actually cross. On the downside, new development slows when the market value

line falls below the replacement cost line. Historically, new hotel development

usually does not begin to slow until the market value line crosses the replacement

cost line.

At the point in time when the market value line falls below the replacement cost

line, it can be assumed that the segment is probably close to being overbuilt. If the

capitalized earnings of a hotel creates a value that is less than its construction cost,

then the hotel is likely to have difficulty paying debt service particularly if the

property is over leveraged. This is usually a good time for hotel buyers to start

acquiring distressed hotels.

When the market value line is above the replacement cost line, existing hotels are

overly expensive to acquire and new development becomes feasible. Cash flow is

usually sufficient to cover debt service, so lenders jump into the market with funds

that enable developers to build new projects. By knowing where you are on the

market value versus replacement cost graph, you are able to time your buying,

building, and selling activities.

Referring to Graph 6.1, it is apparent that market values in the deluxe market

segment essentially equated to replacement cost levels in 1998 for the first time

since 1986. Beginning in 1999, market values are expected to exceed replacement

costs in this segment, with this trend being maintained throughout the projection

period. In Graph 6.2, note that luxury segment market values dropped below

replacement cost levels in 1990, but began to exceed replacement costs in 1996.

Similar trends are noted in Graph 6.3, which pertains to the upscale segment. Graph

6.4 indicates that new construction in the mid-scale (with no food & beverage

facilities) segment has been feasible since 1994, although the margin between

market values and replacement costs is narrowing. In the economy market

segment, summarized in Graph 6.5, market values are expected to drop below

replacement cost levels in 2000. Graph 6.6 indicates that the margin between

market value and replacement cost has been consistently narrow since 1990.

Income Capitalization Approach

The income capitalization approach converts the anticipated future benefits

of property ownership (dollar income) into an estimate of present value. In

hotel-motel valuation, this approach typically involves a discounting proce-

dure.

The income capitalization approach is generally the preferred technique for appraising income-producing properties because it closely simulates the investment rationale and strategies of knowledgeable buyers. The approach is particularly relevant to hotel and motel properties, which involve relatively high risks and are bought for investment purposes only. Most of the data used in the income capitalization approach is derived from the market, which reduces the need for unsupportable, subjective judgments.

The income capitalization approach is applied in three steps.

- Forecast net income for a specified number of years.

- Select an appropriate discount factor or capitalization rate.

- Apply the proper discounting and/or capitalization procedure.

Each of these steps will be discussed in detail.

Forecasting Net Income

Many terms are used to describe the net income that is capitalized into an estimate of value -- *net income before recapture, net income before depreciation*, or *net operating income*. All of these terms may be defined as the annual net income before financial charges (e.g., as the recapture of debt service) are deducted. In this book this concept is referred to as net income before debt service (after a reserve for replacement).

In the income capitalization approach, the forecast of net income before debt service is based on two assumptions: the income and expenses forecast are expressed in changing dollars and management is competent.

When the first edition of this book was published in 1978, the use of constant dollars in all hotel projections was recommended. As inflation became a more important consideration to both hotel lenders and investors, however, it became apparent that interest, discount, and capitalization rates were being ad-

justed upward for inflation. Hotel investors now base their purchases on the

property's expected future benefits with inflation built in, so it is also built

into the other investment parameters.

Forecasts of income and expenses are usually based on competent manage-

ment because the quality of management plays an important role in the profit

potential of a lodging facility. The appraiser must equalize the effects of vary-

ing managerial expertise by assuming that the property being appraised will

be managed competently. In reality, management quality may be poor, com-

petent, or superior. If the property is currently under poor management, the

appraiser is justified in projecting improved operating results based on com-

petent management. If, on the other hand, the subject has superior manage-

ment, the income and expenses used to estimate market value should reflect

less managerial skill -- i.e., lower revenue and/or higher expenses. No such

assumption is needed if management is fixed by a long-term contract and

would not change in the event of a sale, or if the appraiser is estimating in-

vestment value rather than market value. Investment value is the value to a

particular investor based on individual financial and managerial require-

ments. It differs from market value in that market value must represent the

actions of typical buyers and reflect average, competent management.

The procedure for forecasting income before interest and depreciation has

already been described. The appraiser defines the market area, locates and

quantifies the demand, and allocates the room nights among the competitive

facilities. This procedure provides the information needed to estimate occu-

pancy and average rate. Based on these data, rooms revenue and other

sources of income such as food and beverage sales and telephone income can

be computed. Expense data can be obtained from actual operating statements

if the subject is an existing property, or from comparable properties and na-

tional averages if the subject is a proposed facility.

Hotel-Motel Life Cycle

The expected flow of net income before debt service must be assessed to se-

lect the appropriate discounting procedure. All real estate investments have

specific life cycles that show the rise and fall of net income over the proper-

ty's economic life. Most income-producing properties reach their full eco-

nomic potential relatively quickly. This level may then be maintained for a

number of years and then gradually declines as various forms of depreciation

erode the property's income.

It generally takes some time for lodging facilities to achieve their maximum

level of income. A typical hotel will experience rising occupancy in its first

two to four years of operation; often, net income does not cover normal debt

service during this period. A stabilized level of income normally is reached

sometime between the second and fifth years of operation; this stabilized lev-

el represents the property's discounted average net income. The income be-

fore debt service will usually rise above the stabilized level for a few years,

and then gradually start to decline between the seventh and twelfth years be-

cause of physical deterioration and/or functional and external obsolescence.

This decline continues over the remaining economic life of the property. The

life cycle of a lodging facility is not predetermined, however. It can be length-

ened or shortened depending on how much maintenance and periodic up-

grading the owner is willing to do.

Table 6.8 shows net income figures for a hotel over its 40-year life cycle,

where a sale of the property is assumed to occur at the end of the 40th year.

The income from the 40th year includes both the net income and sale pro-

ceeds.

Proposed hotels and motels are appraised as of the beginning of their life cy-

cles, but existing lodging facilities may be appraised at any point in the cycle.

By estimating a property's position in the life cycle, the appraiser can project

future net income before debt service (if adequate market data are available)

and select an appropriate discounting procedure.

Selecting Appropriate Capitalization Rates and Discount Factors

Capitalization rates and discount factors are used to convert expected future income into an indication of value. These rates and factors have an interest component, which reflects the return on capital, and a recapture component, which provides for a return of capital.

Theoretically the interest component can be derived through risk and investment analysis. Starting with a base rate that represents the minimal risk of a safe investment such as a federally insured savings account, the analyst makes a series of upward adjustments to reflect different elements of risk and the investment burden. For example, adjustments might be made for the following factors:

	%
Safe rate (minimum risk)	**X**
Add for general hostelry risk	1_1
Add for management burden	1_2
Add for food and beverage risk	1_3

Add for rapid functional obsolescence 1_4

Add for lack of liquidity 1_5

Add for other elements 1_6

                                           Final interest rate

In practice estimating the magnitude of each upward adjustment is too sub-
jective a process to provide a supportable interest rate. Utilizing the analyti-
cal expertise of the hundreds of money managers who serve the nation's
lending institutions can produce a more reliable rate.

Generally a hotel investment consists of a large amount of mortgage money
(55%-75% of the total investment) and a smaller amount of equity capital
(25%-45%). Thus 55% to 75% of a hotel project's cost of capital is based on the
mortgage interest rate, which implies that 60% to 75% of the capitalization or
discount rate is determined by the cost of the mortgage financing. The lend-
er, who considers all possible risks, establishes the interest rate on a hotel
mortgage. Obviously the mortgagee is in a more secure position than the eq-

uity investor but, in the event of a foreclosure, the lender may be forced to

assume the equity position.

To develop a capitalization rate, the appraiser first researches the cost of the

debt component of the investment by evaluating recent hotel financing trans-

actions. To simplify the calculations for appraisal purposes, the interest rate is

generally assumed to be fixed rather than variable. Although variable-rate

mortgages are used to finance some hotel projects, it is often possible to have

another lending entity fix the interest rate at a specific level, which effectively

converts the variable payments into fixed payments. For the purpose of illus-

tration, a fixed payment mortgage will be used.

The mortgage provision that has the greatest economic impact on an invest-

ment is the mortgage interest rate. To assess the cost of mortgage capital, ho-

tel appraisers must know the current lending rates for hotel mortgage loans.

In order to provide appraisers with a reference point from which to estimate

the cost of mortgage financing, there is a critical need for reliable, timely es-

timates of hotel mortgage interest rates.

One procedure for accumulating mortgage rate information is to survey

lenders actively making hotel loans. This approach will generally yield re-

sults, but the data may not be very accurate for the following reasons:

- It may be difficult to find lenders who are actively lending on hotel projects.

- Even lenders who are active in the hotel lending market do not make hotel loans

  on a regular basis. Therefore any information obtained for these sources may be

  dated, particularly in a fast-changing money market.

- Not all lenders are willing to provide data relative to the loans they have made.

- A lender who responds to an interest rate survey may provide information that

  represents the "asking price" for a hotel loan, rather than the final terms

  negotiated.

A better, more reliable approach is for the appraiser to obtain accurate infor-

mation on hotel loans actually originated by lenders. The best source for this

type of data is the American Council of Life Insurance. This organization,

which represents most of the major life insurance companies, publishes quar-

terly reports on the hotel mortgages originated by their member companies.

Some of the relevant data available to subscribers include the number of

loans made, the total dollar amount loaned, the interest rate, the loan-to-

value ratio, and the term of the loans.

The primary disadvantage of using information published by the American

Council of Life Insurance is that the data are generally four to six months old

by the time they are accumulated and distributed. Thus appraisers need to

find a way to update the data continuously. Ideally appraisers could use as an

indicator some type of money market instrument with a rate of return (yield)

that could be obtained on a daily basis. If the movement of this rate showed a

high correlation with hotel mortgage interest rates, then a regression equa-

tion could be developed to estimate current hotel mortgage interest rates us-

ing the known money market instrument.

HVS International developed such a procedure by running a series of regres-

sion analyses. Quarterly mortgage interest rate data supplied by the Ameri-

can Council of Life Insurance were compared with numerous, widely report-

ed money market instruments. Included in this analysis were the prime rate,

the federal funds rate, several stock market rates, different types of bond

yields, and variety of similar indexes. As a result of this research, a close

mathematical relationship was found between the average interest rate of a

hotel mortgage and the concurrent yield of an Average A corporate bond as

reported daily in *Moody's Bond Record.*

Table 6.9 shows the annual rates for several of the money market instruments

that were evaluated. The first column shows the interest rates for hotel mort-

gages as reported by the American Council of Life Insurance. The other col-

umns contain the comparative rates including the yields on federal funds, the

prime rate, FHA-insured home mortgages sold in the secondary market, the

Standard & Poors composite index of 500 stocks, and treasury notes, bonds,

and bills of various terms. Table 6.10 shows the annual rates for various cor-

porate bonds. Each table also shows the coefficient of correlation, *R*, which is

derived from the regression analysis used to compare the rates for each mon-

ey market instrument with the hotel mortgage interest rate. The instrument

exhibiting the highest coefficient of correlation (R) provides the most accurate

basis for estimating hotel lending rates.

The table shows that Average A corporate bond yields have the highest coefficient of correlation, so this instrument is used to develop the hotel interest rate regression equation. To best reflect the ever-changing money market climate, a more comprehensive regression analysis was run using the A corporate bond yields over an extended period of time. Table 6.11 sets forth hotel mortgage interest rates and corresponding Average A corporate bond yields on a quarterly basis from 1986 until the third quarter of 1999.

Using the regression command from a computer-based spreadsheet, the following regression output was obtained:

Constant	2.4232
Coefficient of correlation	0.8094

This regression output can be used in the following equation, which calcu-

lates the mortgage interest rate (*Y*) based on the actual yield on an A corpo-

rate bond *(X)*:

$$Y= 2.4232 +.8094X$$

On December 10, 1999, the yield on an A corporate bond was 7.86%. Substi-

tuting this yield for X and solving for Y generates an estimated mortgage in-

terest rate of 8.79%.

Appraisers using this regression approach to update hotel mortgage interest

rates should rerun the regression analysis each quarter when the American

Council of Life Insurance releases its latest data on hotel mortgage interest

rates.

The real strength of mortgage-equity analysis of a real estate investment is

the fact that the mortgage component of the discount rate can be readily sup-

ported with current, highly accurate interest rate data. Most investors would agree that it is far better to have 55% to 75% of the mortgage-equity discount rate fully supported than to rely on a totally subjective (and usually outdated) overall discount rate.

Other sources of lending information include local banks and insurance companies, real estate investment trusts, mortgage brokers, and regulatory agencies. By comparing the rates derived from several sources, an appraiser can estimate the mortgage interest components with relative accuracy.

The mortgage recapture component, which represents the return of the investment, is expressed in the rate of amortization. According to the American Council of Life Insurance, hostelry loans have typically been structured to be repaid over a 20- to 30-year term. The recapture component plus the interest component equals the yearly mortgage constant. The annual debt service is calculated by multiplying the mortgage constant by the original loan amount.

The remaining 25% to 45% of a hotel investment is equity money. Like common stock, which entitles the owner to the residual earnings after all expenses, including debt service, have been paid, real estate equity investments normally provide overall returns that are higher than those demanded by the mortgage component. The short-term equity return, which is called the equity dividend rate by appraisers and the cash-on-cash return by hotel investors represents the annual net income after debt service divided by the value of the equity.

The rate of return that an equity investor expects over a 10-year holding period (the long-term return) is called equity yield. Unlike the equity dividend, which is a short term rate of return, the equity yield specifically considers a long holding period (generally 10 years), annual cash flows impacted by inflation, property appreciation, mortgage amortization, and proceeds from a sale at the end of the holding period. Both the equity dividend and the equity yield will produce a good estimate of value when used with the proper technique and supported by appropriate data.

Accurate data relating to equity return expectations are not always easy to

obtain. However, since the equity return component represents only 25% to

45% of the discount rate (depending on the loan-to-value ratio), the negative

impact of any error is reduced. Hotel appraisers typically rely on two sources

of equity data: investor interviews and past appraisals.

To obtain data through investor interviews an appraiser surveys actual or po-

tential hotel investors who have recently made or contemplated an equity

investment in a lodging facility. Depending on the type of property being ap-

praised, the appraiser should survey either institutional investors or individ-

ual investors. The key to obtaining reliable information from investor inter-

views is to explain carefully the terms *equity dividend* and *equity yield* before

conducting the survey. Many hotel investors may be uncertain as to the exact

meaning of terms such *as overall rate, capitalization rate, or total property yield*. A

misunderstanding of terms can distort the appraiser's findings and make the

survey invalid. Unless the equity investor has a clear understanding of *equity*

dividend or *equity yield*, it is generally best not to include his or her responses

in the results of that particular survey. A broad cross section of active buyers

must be surveyed because each is influenced by a variety of factors. The re-

sults of a limited sample can produce misleading assumptions. For example,

an investor in a high tax bracket may settle for a lower-than-market equity

return if the tax shelter benefits of the investment are particularly attractive.

Similarly, the opportunity to resell a property after several years for a higher

price may induce a buyer to accept a lower equity dividend. Because owning

a hotel has a certain amount of status, some buyers may be willing to accept a

lower equity return. An active hotel-motel broker, such as a member of the

Hotel Motel Brokers Association, can often provide insight into the equity

rates of return demanded in the current market. Good sources of equity in-

formation include typical hotel buyers and investors, lenders seeking equity

participation and joint ventures, and hotel management companies.

The second source of equity return information is readily available to ap-

praisal firms that regularly perform hotel valuations. These appraisers can

derive equity dividend and equity yield rates from actual sales of hotels they

have recently appraised. This approach differs from deriving an overall rate

from the market in that the appraiser uses the actual forecast of income and

expense that was developed in the appraisal immediately preceding the sale. An illustration of this procedure follows.

Example

Over the past 12 months the hotel appraisal firm of HVS International has appraised more than 1,000 hotels in most major market areas. In each of these appraisals a similar mortgage-equity technique was used to forecast income into the future and discount it back to present value at rates that reflect the cost of both debt and equity capital. In instances where hotels were actually sold subsequent to the appraisal, equity dividend and equity yield rate were derived from the projection of income and expense by excluding any incentive management fees and then inserting the projection into the valuation model. The appraised value was adjusted to reflect the actual sale price merely by modifying the return assumptions. Table 6.12 shows a representative sample of hotel sales that were evaluated in this manner and their calculated equity yield rates.

In addition to quantifying the equity dividend and equity yield, the appraiser

sometimes needs to estimate a terminal capitalization rate. When a 10-year

forecast is utilized, the terminal, or going-out, capitalization rate is used to

capitalize the net income in Year 11 into a reversionary value. It is basically an

overall rate that can be estimated with a simple mortgage-equity band of in-

vestment using an equity dividend. Note that this rate is applied to the net

income before debt service at a point in time 11 years after the date of value;

thus it should be adjusted upward somewhat to reflect the fact that the hotel

will probably be somewhat closer to the end of its economic life.

Applying the Proper Capitalization or Discounting Procedure

Several procedures can be used to combine mortgage and equity data into a

discount factor or capitalization rate that will transform a projected net in-

come estimate into an indication of value. The selection of discount factors

and capitalization rates depends on many factors, including the length of the

income projection period, the age of the property and its position in its life

cycle, the nature of the mortgage financing, and the sophistication of equity

investors. The following discussion describes the various methods for devel-

oping discount factors and their proper application in the valuation process.

Discount Each Year's Income Over the Full Life Cycle

The simplest form of valuation begins with a projection of the property's net

income before debt service for each year over the full life of the improve-

ments. Each year's net income is then multiplied by the proper present value

of a reversion of one factor and all these discounted net income figures are

totaled to produce the overall property value.

Capitalize One Stabilized Year's Income

Instead of projecting net income over the entire life of the property, a single,

stabilized estimate of net income can be capitalized at an appropriate rate.

The stabilized net income relates to a representative year or, more technically, it is the discounted average net income over the property's economic life. In estimating stabilized earnings, more weight is given to the income expected during the early years of the investment because this income is less affected by discounting.

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CASE STUDY

Capitalizing Stabilized Income

The forecast of income and expense developed in the case of the proposed Sheraton indicates that the hotel is expected to stabilize in the third year of its operation. The net income before debt service as of the stabilized year is forecasted to be $4,691,000. (Note that this is only one method for estimating stabilized net income and the appraiser should ultimately attempt to reflect the actions of typical buyers and sellers for the type of hotel in question.)

Now the appraiser must develop a rate to capitalize the stabilized net income. One

procedure for developing a capitalization rate is the band-of-investment (weighted

cost of capital) technique. Combining the weighted average of the return demanded

by the mortgage position of the investment with the dividend required by the equity

component results in a capitalization rate that reflects the basic financial composition

of the hotel investment.

Using the previously described mortgage interest rate regression formula and a survey of hotel equity investors, the following mortgage and equity terms were established as appropriate.

Mortgage finance terms:

Interest rate   9.75%

Amortization   25 years

Mortgage constant   10.694%

Loan-to-value ratio   65%

Equity dividend rate   10.0%

The band-of-investment technique is used to develop a capitalization rate that is the

weighted average of the mortgage constant and equity yield rate:

						Weighted
	Portion		Rate			Rate
Mortgage	.65	x	.10694	=		.06951
Equity	.35	x	.10000	=		.03500
		Overall Capitalization Rate		=		.10451

The stabilized net income is divided by the capitalization rate to produce the capital-

ized value.

$$\$4,691,000 \div .10451 = \$44,885,000 \text{ (rounded)}$$

The value can be mathematically proven through the following calculations:

65% Mortgage $29,175,000   x   .10694 = $3,120,000

35% Equity	$15,710,000	x	.10000	=	$1,571,000
	$44,885,000				$4,691,000

These calculations show that the $44,885,000 value can be divided into a mortgage

portion of $29,175,000 and an equity portion of $15,710,000. The yearly mortgage

payment, consisting of interest and amortization, is calculated by multiplying the

original mortgage balance ($29,175,000) by the constant (.10694), which results in an

annual debt service of $3,120,000. The equity dividend is established by multiplying

the equity investment ($15,710,000) by the anticipated equity return (.10), which

yields $1,571,000. The annual debt service plus the equity dividend equals the stabi-

lized net income before debt service.

Essentially, the band-of-investment technique works backwards, using the projected

stabilized net income to calculate the value that will meet the demands of both the

mortgage and equity investors. The components that form the band of investment

(mortgage terms and equity requirements) can be well documented and supported.

However, the stabilized net income used in this approach does not always reflect the

potential for low income during the early years of the investment. To get a better in-

dication of the net income of a property in its initial years, the analyst should project

several years of income and expenses.

Another way to derive a capitalization rate is to analyze the terms and condi-

tions of actual market sales. For example, assume an investor has recently

purchased a motel for $3,000,000. An income analysis indicates that the prop-

erty has a stabilized income before interest and depreciation of $359,700. The

market-derived overall capitalization rate for this sale is:

$$\frac{\$ \quad 359,700}{\$3,000,000} = 11.99\%$$

To apply this or any other market-related procedure, the appraiser needs a

complete understanding of the transaction and the motivations of the parties

involved. Adjustments must be made for any unusual factors so that the capi-

talization rate derived represents normal market conditions. Some questions that the appraiser might ask are:

- Is the stated selling price the market value or has unusual existing or purchase-money financing affected the transaction price?

- Is the price based on existing or anticipated income?

- Is the buyer motivated by special factors such as tax shelter or referral benefits?

- Does the property suffer from deferred maintenance that must be corrected by the buyer?

- Did the transaction involve a willing buyer and a willing seller, both with full knowledge of all circumstances?

- Is the comparable property somewhat similar to the property being appraised with respect to size, location, market, and condition?

- Does the income statement of the comparable contain a reserve for replacement? If it does not, the subject property's projected income before debt service should also exclude a reserve for replacement.

An appraiser is seldom able to obtain enough data on the sale of a compara-

ble hotel to derive a meaningful capitalization rate based on the current mar-

ket. Simply understanding the motivations of the buyer and the seller re-

quires more than a casual observation of the transaction.

Ten-Year Forecast Using an Equity Yield Rate

To eliminate some of the uncertainties associated with excessively long-term

net income projections, and specifically to show the normal occupancy build-

up for new hotels, most appraisers use projection periods of three to 10 years.

A 10-year projection using an equity yield rate is similar to an Ellwood valua-

tion approach, in which the yearly income to equity plus an equity reversion

is discounted at an equity yield rate, and the income to the mortgagee is dis-

counted at a mortgage yield rate. The sum of the equity and mortgage values

is the total property value.

The benefits to the equity position include equity dividends from the net income remaining after debt service during the ten-year projection period and the gain or loss realized from the property's assumed resale. The resale or reversionary benefits include the gain or loss caused by value appreciation or depreciation plus any mortgage amortization. The benefits to the mortgage position are interest and amortization plus repayment of the remaining mortgage balance at the end of 10 years.

Valuation using a 10-year income projection and an equity yield rate is performed in four steps.

- The terms of typical hotel financing are set forth, including the interest rate, amortization term, and loan-to-value ratio.

- An equity yield rate of return and terminal capitalization rate are established.

- The value of the equity component is calculated and added to the initial mortgage amount to produce the overall property value.

- The value estimate is allocated between the mortgage and equity components.

Researching and analyzing typical financing terms has been discussed in detail, so the next step is to establish an equity yield rate of return. Currently a number of hotel buyers base their equity investments on a 10-year equity yield rate projection that takes into account the benefits of ownership such as periodic cash flow distributions, residual sale or refinancing distributions that return any property appreciation and mortgage amortization, income tax benefits, and non-financial considerations such as status and prestige. In addition, the appraiser must estimate a terminal capitalization rate, which will be used to capitalize the Year 11 net income into a reversionary value.

Next, the value of the equity component is calculated by deducting the yearly debt service from the forecasted income, which leaves the net income to equity for each year of the forecast. The net income as of Year 11 is capitalized into a reversionary value. After deducting the mortgage balance as of the end of the tenth year as well as normal legal and selling costs, the equity residual is discounted to the date of value at the equity yield rate. Then the net income to equity for each of the 10 projection years is also discounted. The sum of these discounted values equals the value of the equity component. Adding

the equity component to the initial mortgage balance yields the overall prop-
erty value.

Because the amount of the mortgage and the debt service are unknown, but
the loan-to-value ratio is determined in Step 1, the calculation can be solved
either through an iterative process using a computer or with an algebraic
equation that computes the total property value.

A complex algebraic equation that solves for the total property value using
the 10-year mortgage-equity technique was developed by Suzanne R. Mellen,
MAI. This equation is known as the simultaneous valuation formula. A com-
plete discussion of this technique is contained in Mellen's article, "Simultane-
ous Valuation: A New Capitalization Technique for Hotel and Other Income
Properties," which appeared in the April 1983 issue of The *Appraisal Journal*.
Material from this article has been incorporated into this chapter.

Finally, the value estimate is proven by allocating the total property value between the mortgage and equity components and verifying that the rates of returns set forth in Steps I and 2 can be precisely met through the forecasted net income.

Each step in the process will be illustrated using the case study example.

Step 1. Determine the appropriate mortgage debt financing terms.

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CASE STUDY

Determining Financing Terms

The mortgage interest regression formula indicates a current interest rate of 9.29%. Since the mortgage data reported by the American Council of Life Insurance generally represents investment-grade hotel properties, the appraiser may want to adjust

this rate for the location, type of hotel, age and condition of the property, operating history, local supply and demand trends, management expertise and affiliation, and interest being appraised.

It is assumed that the proposed Sheraton Hotel will have new facilities, good management, and a recognized affiliation. Offsetting these positive attributes is the projected downward trend in area occupancies as additional rooms open in the market and become more competitive. In addition to increased competition, the Sheraton will have to survive the normal buildup of occupancy experienced by all new hotels; many lenders account for this risk factor. Based on the appraiser's analysis, the following mortgage terms would probably be available for the proposed Sheraton.

Interest rate	9.75%
Amortization schedule	25 years
Payments per year	Monthly
Mortgage constant	.10694
Mortgage term	10 years
Loan-to-value ratio	65%

Step 2. Estimate an appropriate equity yield and a terminal capitalization rate.

CASE STUDY

Estimating equity yield and terminal capitalization rates

A survey of hotel investors was conducted to determine their current equity yield requirements. In addition the appraiser reviewed recent appraisals of hotels that sold proximate to the date of value. The range of equity yields for hotels comparable to the proposed Sheraton is 18% to 22%.

Using the same investment criteria employed to determine the mortgage interest rate, a 21% equity yield rate was selected for the proposed Sheraton. The terminal capital-

ization rate can be estimated with the mortgage-equity band-of-investment utilizing

an equity dividend rate. The factors that were considered are set forth on pages xxx-

xxx – capitalizing stabilized income.

	Portion		Rate		Weighted Rate
Mortgage	.65	x	.10694	=	.06951
Equity	.35	x	.10000	=	.03500
		Overall Capitalization Rate		=	.10451

Adjusting the rates to reflect the tenth year terminal capitalization rate produces a

going-out rate of 11% for the proposed Sheraton.

Step 3. Estimate overall property value by valuing equity component and

adding initial mortgage balance.

By this point in the analysis, the appraiser has made all the necessary subjec-

tive and objective decisions. The remainder of the process is purely mathe-

matical. The appraiser must solve an algebraic equation which calculates the

exact amount of debt and equity that the hotel will be able to support based

on the anticipated cash flow derived from the forecast of income and expense

and the specific return requirements demanded by the mortgage lender (in-

terest) and the equity investor (equity yield).

To solve for the value of the mortgage and equity components, the appraiser

first deducts the yearly debt service from the forecast of income before debt

service; the remainder is the net income to equity for each year in the fore-

cast. The net income as of Year 11 is capitalized into a reversionary value us-

ing the terminal capitalization rate. The equity residual, which is the total re-

versionary value minus the mortgage balance at that point in time and any

broker and legal cost associated with the sale, is discounted to the date of

value at the equity yield rate. The net income to equity for each of the forecast

years is also discounted. The sum of these discounted values equates to the

value of the equity component. Since the equity component represents a spe-

cific percentage of the total value, the value of the mortgage and the total

property value can be easily computed.

The process described above can be expressed in two algebraic equations,

which set forth the mathematical relationships between known and unknown

variables. The symbols used to represent these variables are listed below.

NI   Net income available for debt service

V   Value

M   Loan-to-value ratio

F   Annual debt service constant

N   Number of years in projection period

d_e Annual cash available to equity

d_r Residual equity value

b   Brokerage and legal cost percentage

P*   Fraction of loan paid off in projection period

Fp   Annual constant required to amortize the entire loan during the pro-

jection period

Rr   Overall terminal capitalization rate applied to net income to calculate

total   property reversion (sale price at end of the projection period)

1/Sn   Current worth of 1$ (discount factor) at the equity yield rate

Using these symbols a series of formulas can be derived to express some of

the components making up this mortgage-equity valuation process.

$$*P=(f-i) \div (fp - i) \text{ where } i=\text{the interest rate of the mortgage}$$

Debt service. To calculate a property's debt service, the appraiser first deter-

mines the amount of the mortgage, which is the total property value (*V*) mul-

tiplied by the loan- to-value ratio (*M*). Then the amount of the mortgage is

multiplied by the annual debt service constant (f) using the following formu-

la:

$$f \; x \; M \; x \; V = \text{debt service}$$

Net income to equity (equity dividend). The net income to equity (d_e) is the property's net income before debt service (NI) minus the debt service. The following formula represents net income to equity:

$$NI - (F \; X \; M \; X \; V) = d_e$$

Reversionary value. The value of the hotel at the end of Year 10 is calculated by dividing the net income in Year 11 before debt service (NI") by the terminal capitalization rate (R_r). The following formula calculates the property's reversionary value in Year 10:

$$NI'' / R_r = \text{reversionary value}$$

Broker and legal costs. When a hotel is sold, costs associated with the transac-

tion normally include a broker's commission and attorneys' fees. For a hotel

transaction broker and legal costs typically range from 1% to 4% of the sale

price. Because these expenses reduce the proceeds to the seller, they are usu-

ally deducted from the reversionary value in mortgage-equity analysis. Bro-

ker and legal costs (b) expressed as a percentage of the reversionary value

(NI''/R_r) can be calculated with the following formula:

$$(b \; (NI''/R_r)) = \text{broker and legal costs}$$

Ending mortgage balance. The balance of the mortgage at the end of Year 10

must be deducted from the total reversionary value (debt and equity) to iso-

late the equity residual. A financial formula is used to calculate the fraction of

the loan paid off, which is expressed as a percentage of the original loan bal-

ance at a particular point in time. The mortgage interest rate (i) is deducted

from the annual debt service constant of the loan over the entire amortization

period (f) and the result is divided by the annual constant required to amor-

tize the entire loan over the projection period (sub p) minus the mortgage interest rate. The formula is

$$(f\text{-}i) \;/(f_p\text{-}i) = P$$

If the fraction of the loan paid off expressed as a percentage of the initial loan balance is P, then the percentage of the loan remaining can be expressed as 1 - P. Thus, the ending mortgage balance is the fraction of the loan remaining (1-P) multiplied by the amount of the initial loan (M X V). The formula is

$$(I\text{ -}P) \times M \times V = \text{ending mortgage balance}$$

Equity residual value. The value of the equity when the property is sold at the end of the projection period (d,) is the reversionary value minus broker and legal costs and the ending mortgage balance. The following formula represents the equity residual value:

$$(NI''/R_r) - (b(NI''/R_r)) - (('1\text{-}P) \times M \times V)) = d_r$$

Annual cash flow to equity. The annual cash flow to equity consists of the equity dividend for each of the 10 projection years plus the equity residual at the end of Year 10. The following formulas represent the annual cash flow to equity:

$$N1' - (F \times M \times V) = d_e'$$

$$N1^2 - (F \times M \times V) = d_e^2 \dots$$

$$N1^{10} - (F \times M \times V) = d_e^{10}$$

$$(NI''/R_r) - (b(NI''/R_r)) - ((1\text{-}P) \times M \times V))\, d_r$$

Value of the equity. If the initial amount of the mortgage is calculated by multiplying the loan-to-value ratio (M) by the value of the property (V), then the

equity value will be 1 minus the loan-to-value ratio times the property value.

The formula is

$$(1-M)\ V$$

Discounting the cash flow to equity to present value. The cash flow to equity for

each of the projection years is discounted to present value at the equity yield

rate $(1/S^n)$. The sum of all these cash flows is the value of the equity (I-M)V.

The following formula calculates equity as the sum of the discounted cash

flows:

$$(d_e{}'\ X\ 1/S^1) + (d_e{}^2\ X\ 1/S^2) + \ldots + (d_e{}^{10}\ X\ 1/S^{10})$$

$$+(d_r\ X\ 1/S^{10}) = (l-M)V$$

Combining equations: annual cash flow to equity and cash flow to equity discounted

to present value. The final step in the process is to make one, overall equation

that shows that the annual cash flow to equity plus the yearly cash flows dis-

counted to present value equal the value of the equity.

$$((N1' - (f \text{ X } M \text{ X } V))\ 1/S^1) +... ((N1^2 - (f \text{ X } M \text{ X } V))\ 1/S^2) + …$$

$$…+((N1^{10} - (f \text{ X } M \text{ X } V))\ 1/S^{10})+$$

$$…+ (NI''/R_r\ ) - (b(NI''/R_r)) - ((1 - P)\ x\ M\ x\ V)\ 1/S^{10}) = (1 - M)V$$

Since the only unknown is the property value (V), this equation is easy to

solve.

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CASE STUDY

Applying the 10-Year Discounted Cash Flow Valuation Formula – Proposed

Sheraton

Generally the net income before debt service is projected beyond the stabilized year

at an assumed rate of change. By increasing a property's revenue and expenses at the

same rate of inflation, the net income expressed as a percentage of total revenue will

remain constant and the dollar amount of net income will escalate each year at the

rate of change. When a category of revenue or expense is expected to increase at a

different rate, the appraiser should reflect this aberration in that specific year's fore-

cast of income and expense. This situation is likely to be the result of contractual

changes in a ground rent expense, use of an escalating reserve for replacement per-

centage, or an expected change in the property tax expense.

The appraiser finds that hotel investors are using inflation rates of approximately 3%.

Table C.S.6.2 shows the net income of the proposed Sheraton Hotel projected beyond

the stabilized year at a 3% rate of inflation.

Solving for Value Using the Simultaneous Valuation Formula

In the case of the subject property, the following variables are known:

Annual net income	NI	See Table C.S.6.2
Loan-to-value ratio	M	65%
Debt service constant	f	0.10694
Equity yield	Y_e	21%
Brokerage and legal fees	b	3%
Annual constant required to amortize the loan in 10 years	f_P	0.156924
Terminal capitalization rate	R_r	11%

Table C.S.6.3 shows the present worth of a $1 factor at the 21% equity yield rate.

Intermediary calculations must be made using these known variables before the simultaneous valuation formula can be applied.

The fraction of the loan paid off during the projection period is calculated as follows:

$$P = (0.10694 - .0975) \div (0.156924 - .0975) = 0.158799$$

The annual debt service is calculated as $f \ x \ M \ x \ V$.

$$0.10694 \ x \ 0.65 \ x \ V = 0.069509V$$

Next, the formula is expressed in terms of V.

$$(2{,}120{,}000 - 0.0695V) \ x \ 0.826446 \ +$$

$$(3{,}541{,}000 - 0.0695V) \ x \ 0.683013 \ +$$

$$(4{,}691{,}000 - 0.0695V) \ x \ 0.564474 \ +$$

$$(4{,}832{,}000 - 0.0695V) \ x \ 0.466507 \ +$$

$$(4{,}977{,}000 - 0.0695V) \ x \ 0.385543 \ +$$

$$(5{,}126{,}000 - 0.0695V) \ x \ 0.318631 \ +$$

$$(5{,}280{,}000 - 0.0695V) \ x \ 0.263331 \ +$$

$$(5{,}438{,}000 - 0.0695V) \ x \ 0.217629 \ +$$

$$(5{,}601{,}000 - 0.0695V) \times 0.179859 +$$

$$(5{,}769{,}000 - 0.0695V) \times 0.148644 +$$

$$(((5{,}942{,}000 \div 0.11) - (0.03 \times (5{,}942{,}000 \div 0.11)) -$$

$$((1\text{-}0.158799) \times 0.65 \times V)) \times 0.148644) = (1 - 0.65) \times V$$

Then, like terms are combined.

$$\$24{,}852{,}044 - 0.363069\, V = (1 - 0.65)\, V$$

$$\$24{,}852{,}044 = 0.71307\, V$$

$$V = \$24{,}852{,}044 \div 0.71307$$

$$V = \$34{,}852{,}000 \text{ (rounded)}$$

Proof of Value

The value is mathematically proven by calculating the yields to the mortgage and equity components over the projection period. If the mortgagee receives its 9.75%

yield and the equity yields 21%, then $34,852,000 is the correct value estimate derived

by the income capitalization approach.

The indicated market value is allocated as follows:

Mortgage component	0.65	$22,654,000
Equity component	0.35	12,198,000
		$34,852,000

Calculation of annual debt service:

Mortgage component	$22,654,000
Mortgage constant	0.106936
Annual debt service	$ 2,423,000 (rounded)

Net income to equity is forecast in Table C.S.6.4.

The residual value to equity at the end of Year 10 is calculated by capitalizing the

Year 11 net income as follows:

$$\$5,942,000 \div 0.11 = \$54,018,000 \text{ (rounded)}$$

Sales proceeds	$54,018,000
Less:	
Broker & legal fees	1,621,000
Mortgage balance	19,057,000
Net sales proceeds	$33,340,000

The annual cash flow to equity plus the residual equity value is discounted to present

value at the equity yield rate of 21 % (see Table C.S.6.5).

The table demonstrates that the equity investor will receive a 21% yield on the equity

component if the annual cash flow and reversion take place as projected. Since the

debt service factored into the calculations is based on an interest rate of 9.75%, the

required yield for the lender will also be achieved. In addition to the yield to the eq-

uity investor, Tables C.S.6.6 and 6.7 show the property yield (15.0%) and the mort-

gage yield (9.68%).

As indicated in Table C.S.6.7, the mathematically correct yield to the mortgagee cal-

culates to 9.68%. Whereas the mortgage constant and value are calculated on the ba-

sis of monthly mortgage payments, the mortgage yield in this proof assumes single

annual payments. As a result, the proof's derived yield may be slightly less than the

stipulated investment parameter.

Applying the 10-Year Discounted Cash Flow Valuation Formula – Embassy

Suites

The preceding methodology applied in the case of the proposed Sheraton has also

been applied for the existing Embassy Suites. Table C.S.6.8 shows the net income of

the Embassy Suites, projected beyond the stabilized year at a 3% rate of inflation.

Solving for Value Using the Simultaneous Valuation Formula

Because the Embassy Suites is an existing hotel with an established operating history, it is subject to slightly less risk than that associated with the proposed Sheraton. As such, we have applied slightly different investment parameters for this portion of the case study. Specifically, we have applied an interest rate equal to 9.5% and an equity yield rate equal to 20%. Otherwise, the same variables used in the valuation of the proposed Sheraton are considered to be appropriate for the existing Embassy Suites:

Annual not income	NI	See Table C.S.6.8
Loan-to-value ratio	M	65%
Debt service constant	f	0.104844
Equity yield	Y_e	20%
Brokerage and legal fees	b	3%
Annual constant required to amortize the loan in 10 years	f_P	0.15527
Terminal capitalization rate	R_r	11%

Intermediary calculations must be made using these known variables before the simultaneous valuation formula can be applied.

The fraction of the loan paid off during the projection period is calculated as follows:

$$P = (0.104844 - .095) \div (0.15527 - .095) = 0.163306$$

The annual debt service is calculated as $f \ x \ M \ x \ V$.

$$0.104844 \times 0.65 \times V = 0.0681V$$

Next, the formula is expressed in terms of V.

$$(4,103,000 - 0.0681V) \times 0.8333 +$$

$$(3,596,000 - 0.0681V) \times 0.6944 +$$

$$(3{,}198{,}000 - 0.0681V) \times 0.5787 +$$

$$(3{,}532{,}000 - 0.0681V) \times 0.4823 +$$

$$(3{,}638{,}000 - 0.0681V) \times 0.4019 +$$

$$(3{,}747{,}000 - 0.0681V) \times 0.3349 +$$

$$(3{,}860{,}000 - 0.0681V) \times 0.2791 +$$

$$(3{,}975{,}000 - 0.0681V) \times 0.2326 +$$

$$(4{,}096{,}000 - 0.0681V) \times 0.1938 +$$

$$(4{,}219{,}000 - 0.0681V) \times 0.1615 +$$

$$(((4{,}344{,}000 \div 0.11) - (0.03 \times (4{,}344{,}000 \div 0.11)) -$$

$$((1\text{-}0.163306) \times 0.65 \times V)) \times 0.161506) = (1 - 0.65) \times V$$

Then, like terms are combined.

$$\$21{,}849{,}904 - 0.373545\, V = (1 - 0.65)\, V$$

$$\$21{,}849{,}904 = 0.72355\, V$$

$$V = \$21{,}849{,}904 \div 0.72355$$

$$V = \$30,198,000 \text{ (rounded)}$$

Proof of Value

The value is mathematically proven by calculating the yields to the mortgage and equity components over the projection period. If the mortgagee receives its 9.5% yield and the equity yields 20%, then $30,198,000 is the correct value estimate derived by the income capitalization approach.

The indicated market value is allocated as follows:

Mortgage component	0.65	$19,629,000
Equity component	0.35	10,569,000
		$30,198,000

Calculation of annual debt service:

Mortgage component	$19,629,000
Mortgage constant	0.104844
Annual debt service	$ 2,058,000 (rounded)

Net income to equity is forecast in Table C.S.6.9.

The residual value to equity at the end of Year 10 is calculated by capitalizing the

Year 11 net income as follows:

$$\$4,344,000 \div 0.11 = \$39,491,000 \text{ (rounded)}$$

Sales proceeds	$39,491,000
Less:	
Broker & legal fees	1,185,000
Mortgage balance	16,423,000
Net sales proceeds	$21,883,000

The annual cash flow to equity plus the residual equity value is discounted to present value at the equity yield rate of 20 % (see Table C.S.6.10).

The table demonstrates that the equity investor will receive a 20% yield on the $10,569,000 investment if the annual cash flow and reversion take place as projected. Since the debt service factored into the calculations is based on an interest rate of 9.5%, the required yield for the lender will also be achieved. In addition to the yield to the equity investor, Tables C.S.6.11 and 6.12 show the property yield (13.8%) and the mortgage yield (9.4%).

One advantage of valuing a hotel with a 10-year forecast using an equity yield rate is that the projection period can specifically show the build-up of net income over the assumed holding period used by most investors. Another benefit is that the value of the mortgage component can be easily substantiated in the market by analyzing current and comparable mortgage terms for similar lodging facilities; assuming a 65% loan-to-value ratio, 65% of the property's market value can be supported.

The difficult part of this approach is estimating the proper equity yield rate.

Although many hotel owners have become more sophisticated, they do not

always understand the meaning of equity yield from an appraiser's point of

view. Some still think in terms of cash on cash or equity dividend and hold

that the reversionary benefits of property appreciation and mortgage amorti-

zation are inherently considered in an equity dividend, rather than specifical-

ly incorporated into a yield calculation. Consequently, care must be exercised

in obtaining yield rates from investors to ensure that their responses repre-

sent yields, not dividends.

Even with good data and support, estimating a hotel equity yield rate is a

subjective process based largely on judgment. On the other hand, the esti-

mate of a hotel mortgage interest rate can be well documented using the in-

terest rate regression formula described previously and published life insur-

ance industry data. Although an element of subjectivity remains, the value of

the mortgage component is largely objective. Thus the capitalization tech-

nique produces results that are approximately 65% objective and 35% subjec-

tive. In contrast, a 10-year forecast using a discount rate produces results that

must be considered largely subjective and does not reflect the investment

analysis procedures currently used by typical hotel buyers.

Ten-Year Forecast Using a Discount Rate

Some large institutional investors who purchase hotels on an unleveraged basis

(with no debt capital) will apply an overall discount rate to the 10-year forecast of

net income before debt service. To this discounted cash flow they add the

discounted value of the property at the end of the tenth year, which is derived by

capitalizing the net income in Year 11 at the terminal capitalization rate.

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CASE STUDY

Applying a Discount Rate to the Ten-Year Forecast

In the following example, data associated with the proposed Sheraton por-

tion of the case study is used to illustrate 10-year forecasting using a discount

rate. Table C.S.6.13 sets forth the associated data and assumptions.

The reversionary value is calculated by capitalizing the net income before debt ser-

vice in Year 11 at the terminal capitalization rate.

$$\$5,941,000 \div 0.11 = \$54,009,091$$

Sales proceeds	$54,009,091
Less: brokerage & legal	1,620,273
Net sales proceeds	$52,388,818

The net income before debt service for each year plus the reversionary value (net

sales proceeds) is discounted to present value at the 15% discount rate. (See Table

C.S.6.14)

The 10-year forecast using a discount rate does not consider the impact of
mortgage debt, leverage, and the specific equity demands of typical hotel in-
vestors. Furthermore, it requires a subjective estimate of the entire discount
rate, not just the equity portion as in the equity yield approach. Since very
few hotel investors purchase lodging facilities on an unleveraged basis, doc-
umented support for the discount rate is usually either unavailable or incon-
clusive.

Ten-Year Forecast Using a Debt Coverage Ratio

The Ten-Year Discounted Cash Flow Valuation Formula assumes a mortgage-equity
relationship and a fixed loan-to-value ratio. The Ten-Year Forecast Using a Debt Cov-
erage Ratio also assumes a mortgage equity relationship, but utilizes a specific debt
coverage ratio as of a certain year.

The debt coverage ratio is the ratio of the net income available for debt service as of a specified year divided by the debt service. Thus, if a hotel's net income as of the third year is projected to be $280 and the debt service is $187, the debt coverage ratio is:

$$\$280/\$187 = 1.5$$

This debt coverage ratio assumption forms the basis of valuing the hotel's mortgage component. Once the value of the mortgage component has been estimated, the value of the equity component can then be quantified. The overall property value is therefore the value of the mortgage component plus the value of the equity component.

The initial mortgage balance can be obtained by multiplying the debt coverage ratio by the mortgage constant and dividing this number into the net income before debt service. Assuming a 9% mortgage with a 25-year amortization schedule produces an annual mortgage constant of .1007. The initial mortgage balance or the value of the mortgage component can be calculated as follows:

$$\$280/(1.5 \text{ X} .1007) = \$1,854$$

The next step is to value the equity component. Equity value equals the annual cash flows to equity (equity dividends) plus the equity residual discounted to the present value by the equity yield rate.

The annual cash flow to equity is the net income available for debt service minus the annual debt service. The annual debt service is calculated by multiplying the initial mortgage balance by the mortgage constant:

$$\$1,854 \text{ X} .1007 = \$187$$

The annual cash flow to equity is calculated in Table 6.14.

The present value of the cash flows to equity is the cash flow to equity multiplied by the appropriate present value factor. Table 6.15 identifies this calculation, using an 18% discount rate (equity yield).

The equity residual is the reversionary value, less the ending mortgage balance. The

reversionary value is calculated by taking the projected 11th year's net income before

debt service and capitalizing it by the terminal capitalization rate. From that capital-

ized value the selling expenses such as brokerage and legal are deducted. In this

example, an 11% terminal capitalization is used with selling expenses equating to 2%

of the capitalized value. Table 6.16 shows these calculations.

The equity residual can then be determined by deducting the ending mortgage bal-

ance which, in this example, works out to $1,534. Table 6.17 shows this calculation.

The present value of the equity residual is calculated by multiplying the equity re-

sidual by the appropriate present value factor. Table 6.18 shows this calculation.

The value of the equity component is the present value of the cash flows to equity

plus the present value of the equity residual as shown in Table 6.19.

The overall property value is the value of the mortgage component plus the value of the equity component. Table 6.20 shows this calculation.

Many lenders base their mortgages on a predetermined debt coverage level as of a certain year. This valuation approach works well for those types of investment decisions.

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CASE STUDY

Applying a Debt Coverage Ratio to the Ten-Year Forecast

In the following example, data associated with the proposed Sheraton portion of the case study is used to illustrate ten-year forecasting using a debt coverage ratio, assuming the mortgage lender for the proposed Sheraton wants to base the amount of the mortgage on a debt coverage ratio of 1.46 as of the 2nd year of operation. Based on this assumption, the initial mortgage balance can be obtained by multiplying the debt coverage ratio by the mortgage constant and dividing this number into the net

income before debt service. Assuming a 9.75% mortgage with a 25 year amortization

schedule produces an annual mortgage constant of .106936. Using the second year's

net income available for debt service the initial mortgage balance or the value of the

mortgage component can be calculated as follows:

$3,541/(1.46 X .106936) = $22,680

The next step is to value the equity component. Equity value equals the annual cash

flows to equity (equity dividends) plus the equity residual discounted to the present

value by the equity yield rate.

The annual cash flow to equity is the net income available for debt service minus the

annual debt service.   The annual debt service is calculate by multiplying the initial

by the mortgage constant:

$22,680 X .106936 = $2,425

Table C.S.6.15 identifies how the annual cash flow to equity is calculated.

The present value of the cash flows to equity is the cash flow to equity multiplied by the appropriate present value factor. Table C.S.6.16 assumes a 21% discount rate (equity yield).

The equity residual is the reversionary value, less the ending mortgage balance. The reversionary value is calculated by taking the projected 11th year's net income before debt service and capitalizing it by the terminal capitalization rate. From that capitalized value the selling expenses such as brokerage and legal are deducted. In this example, an 11% terminal capitalization is used with selling expenses equating to 3% of the capitalized value. Table C.S.6.17 shows these calculations.

The equity residual can then be determined by deducting the ending mortgage balance, which in this example works out to $19,079. Table C.S.6.18 shows this calculation.

The present value of the equity residual is calculated by multiplying the equity residual by the appropriate present value factor. Table C.S.6.19 shows this calculation.

The value of the equity component is the present value of the cash flows to equity

plus the present value of the equity residual, as shown in Table C.S.6.20.

The overall property value is the value of the mortgage component plus the value of

the equity component. Table C.S.6.21 shows this calculation.

Conclusion

Of the three valuation approaches available to the appraiser, the income capi-

talization approach generally provides the most persuasive and supportable

conclusions when valuing a lodging facility.

In the selection of a discounting or capitalization procedure, the appraiser

considers the market and the techniques used by hotel buyers and sellers in

reaching their investment decisions. In the past, various procedures have

been employed by hotel investors; their selections have usually been based

on factors such as the quality and reliability of the available data, economic

conditions, inflation, the availability of financing, and risk. A brief summary

of each technique follows.

- Discounting each year's income over the investment's full life cycle. This

  technique is rarely used because a 40-year forecast of income and expenses is

  unreasonably long and there is no comparable or support data to derive a 40-

  year discount rate.

- Capitalize one stabilized year. This simple technique works well for an

  established property that is expected to maintain a stable level of occupancy

  and net income in the future. It is difficult, however, to establish an appropriate

  stabilized net income for hotels with occupancies that are increasing or

  decreasing.

- Ten-year forecast using an equity yield rate. This technique is complicated but it

  most accurately reflects the actions of typical hotel buyers, who purchase

properties based on their leveraged discounted cash flow. Often the mortgage

component can be fully supported by recent market transactions, so 55% to 75%

of the discount rate can be substantiated.

- Ten-year forecast using a discount rate. This technique is simple but less reliable

  because the derivation of the discount rate has little support. Moreover, it is

  difficult to adjust the discount rate for changes in the cost of capital.

Regardless of the technique applied, the estimate of market value should rep-

resent the actions of hotel investors and provide a basis for comparing in-

vestment alternatives.

Developing capitalization rates and applying the proper discounting proce-

dure are crucial to the income capitalization approach. Appraisers should

always try to mirror the rationale and actions of typical buyers and sellers in

the current market. Although some of the capitalization and discounting pro-

cedures described in this chapter were criticized for being overly subjective

and contrary to present investment thinking, the analyst should remember

the axiom of change. The discounting procedure favored by hotel buyers this

year may not be suited to market and investment conditions next year. Appraisers must constantly reevaluate and update their appraisal procedures to reach supportable estimates of market value.