

CHAPTER 14

Property Valuation

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14.01 INTRODUCTION

Hotel owners, lenders, and operators frequently require appraisals to establish the value of properties in which they have an interest. In performing a market study and appraisal, a valuation is essential in order to determine if the subject property is economically feasible. Simply put, a project is considered feasible when its economic value is greater than the cost that was incurred in its development; if the project's value upon completion is less than the cost of its development, then it is considered not feasible. Appraisals are also utilized to establish prices for sales and transfer, to determine the security for mortgage debt, and to verify assessed value for property taxes.

Professional appraisers use a combination of three different approaches in appraising real estate for market value: (1) the cost approach, (2) the sales comparison approach, and (3) the income capitalization approach. Usually, all three are employed in an appraisal, and the appraiser takes into account the inherent strengths of each as well as the nature of the subject property when making the final estimate of market value.

The cost approach is based on a determination of the cost of replacing a property, with adjustments for various forms of depreciation and obsolescence. The sales comparison approach compares the known sales prices of similar hotels with attributes like those of the subject hotel. The income capitalization approach capitalizes the anticipated earnings of the property in order to estimate its total value.

In theory, all three approaches result in the same value estimate. However, in practice the value indicated by the income capitalization approach most closely reflects the sort of analysis generally performed by typical buyers and sellers. The

results from the cost and sales comparison approaches are generally used to support and verify the results of the income approach.

The case study at the end of this chapter illustrates a property valuation using the cost approach and the income capitalization approach.

14.02 **COST APPROACH**

The cost approach yields an estimate of market value by totaling the current cost of replacing a property. This is accomplished by determining the value of the land as if vacant and available and combining it with the depreciated value of the improvements, which is deflated to reflect any physical deterioration or functional or economic obsolescence.

The cost approach may provide a reliable estimate of value for newly constructed properties not suffering from external obsolescence; however, as buildings and other forms of improvements increase in age and begin to depreciate, the resultant loss in value becomes increasingly difficult to accurately quantify.

Knowledgeable buyers of lodging facilities generally base their purchase decisions on economic factors such as forecasted net income and return on investment. Since the cost approach does not reflect any of these income-related considerations, but rather requires a number of subjective and unsubstantiable depreciation estimates, it is not commonly used as the primary process in a hotel valuation.

[1] **Replacement Cost**

Replacement cost is simply the cost of developing a property similar to the subject property. The replacement cost of several elements must be combined to determine the total replacement cost for the subject property. These elements are: property improvement cost, furniture, fixtures, and equipment (FF&E) cost, soft costs, opening costs, and developer's costs.

The replacement cost for property improvements, which include buildings, parking facilities, landscaping, and signage, can be estimated by using information provided by one of several construction cost services, such as Marshall Stevens, Boecke, and Dow. Other sources of replacement data include local building contractors and developers, architects, engineers, and professional cost estimators.

The main element of the replacement cost for property improvements is the replacement construction cost, which is based on a dollar amount per square foot and adjusted by factors that account for time (the current cost multiplier) and location (the local multiplier) to yield the actual building cost per square foot. This amount is then multiplied by the actual square footage of the subject property in order to determine the total improvement replacement cost.

The replacement cost for FF&E can be fairly easily determined by multiplying the amount of money budgeted per room for the proposed property by the final number of rooms in the facility.

Of the remaining elements, soft costs include appraisal fees, financing costs, legal fees, property taxes, and the cost of licenses and permits; opening costs comprise the funds necessary for an operating reserve, working capital, and the initial franchise fee; and the developer's cost is the fee that must be paid to a developer for providing project administration.

[2] Land Value

Land value for a lodging facility typically ranges between 10 and 20 percent of the total value. Land value can be estimated by the sales comparison approach, which uses comparable land sales as a determinant or by the ground lease approach, which is based on the economic value generated by an improvement that represents the highest and best use of the property.

Because it is unusual to find recent sales of comparable vacant land slated for imminent hotel development, the sales comparison approach for land valuation is not likely to produce satisfactory results. When the existing or proposed hotel improvements represent the highest and best use of the property, the ground lease approach is the preferred procedure because it can be readily supported by numerous self-adjusting comparables (e.g., hotels that are constructed on expensive land tend to generate higher rooms revenue), as well as the overall economics of the individual project.

Over the past ten years, hotels have been routinely constructed on leased land. Lease terms do, of course, differ somewhat from hotel to hotel, but the basis for the rental calculation is usually tied to a percentage of the revenue generated by the hotel. By using the forecasted stabilized revenues for the subject property and applying a typical hotel ground lease rental formula, the appraiser determines the hotel's economic rental, or what can be termed the income attributed to the land. The land value is then estimated by dividing the economic rental by an appropriate capitalization rate.

One advantage of this method is that rental formulas are tied directly to a percentage of revenue that inherently reflects both the locational attributes of the site (occupancy and rate) and the allowable density of development, so the resulting economic ground rental justly represents the greatest net return to land over a given period of time. This self-adjusting aspect is one of the main reasons for the reliability of the cost approach.

14.03 SALES COMPARISON APPROACH

The sales comparison approach is used to estimate the value of a property by comparing it with similar properties recently sold in the open market. To obtain an accurate estimate of value, the sales price of a similar property must be adjusted to reflect any differences between it and the subject property.

The sales comparison approach can provide a usable value estimate for simple forms of real estate, such as vacant land and single-family homes, where the properties are homogeneous and adjustments are few in number and relatively simple to compute. However, for larger and more complex investments such as shopping centers, office buildings, and hotels, where the adjustments are numerous and more difficult to accurately quantify, the results of the sales comparison approach become considerably less reliable.

As with the cost approach, hotel investors typically do not use the sales comparison approach to reach final purchase decisions. Various factors, such as the lack of timely hostelry data, the number of unsupported adjustments, and the difficulty involved in determining the true financial terms and human motivations of comparable transactions, usually render the results of the sales comparison approach somewhat questionable. The sales comparison is best used as a means of providing a range of values that bracket and support the income capitalization approach. Any

reliance on its results, however, beyond the establishment of broad generalizations, is not normally justified by the quality of data.

The market-derived capitalization rates used by some appraisers (which rely on data derived from the sales comparison approach) are susceptible to the same shortcomings inherent in the sales comparison approach itself. To substantially reduce the reliability of the income capitalization approach by employing capitalization rates obtained from unsupported market data not only weakens the final estimate of value but also ignores the normal investment analysis procedures employed by typical hotel purchasers.

14.04 **INCOME CAPITALIZATION APPROACH**

Appraisers use the income capitalization approach to value property by analyzing the local market for transient accommodations, examining existing and proposed competition, and developing a forecast of income and expense that reflects current and future anticipated income trends and area cost components up through a stabilized year of operation.

The forecast of income and expense is expressed in current dollars as of the date of each forecasted year. The last forecasted year (the stabilized year) reflects the anticipated operating results of the property over its remaining economic life, including the normal stages of build-up, plateau, and decline. Therefore, such income and expense estimates from the stabilized year forward exclude from consideration any abnormal relation of supply and demand and any transitory or nonrecurring conditions that may result in unusual revenue or expenses for the property.

The conversion of the forecasted income stream into an estimate of value is accomplished by allocating anticipated net income before debt service and depreciation to mortgage and equity components based on market rates of return and loan-to-value ratios. The total of the mortgage component plus the equity component equals the value of the property.

The process of estimating the value of the mortgage and equity components is as follows:

1. The terms for typical hotel financing are set forth, including interest rate, amortization term, and loan-to-value ratio.
2. A cash-on-cash equity dividend rate of return is established. Most hotel buyers base their equity investment decisions on a two- to five-year cash-on-cash equity dividend rate projection, which generally takes the form of a cumulative preferred rate of return to the limited or money partner.
3. The value of the equity component is calculated by first deducting the yearly debt service from the forecasted income before debt service, leaving the net income to equity for each forecasted year. The net income to equity as of the stabilized year is capitalized into a stabilized or residual value and discounted to the date of value at the equity dividend rate. The net income to equity for each of the intervening build-up years is also discounted to the date of value. The sum of these discounted values equates to the value of the equity component. Adding the equity component to the initial mortgage balance yields the overall property value. Although the amount of the mortgage, as well as the debt service,

is unknown, the loan-to-value ratio can be structured in a simultaneous equation that determines the total property value.¹

4. A proof of value is performed by allocating the total property value between mortgage and equity components and verifying that the previously determined rates of return can be precisely met from the forecasted net income.

The underlying reason for converting the forecasted net income of a property into an estimate of value is that investors typically purchase real estate with a small amount of equity (25 to 40 percent) and a large amount of mortgage financing (60 to 75 percent). The amounts and terms of available mortgage financing and the rates of return that are required to attract sufficient equity capital form the basis upon which the appraiser allocates the net income between the mortgage and equity components and then derives a value estimate.

[1] Mortgage Component

Data for the mortgage component are generally developed from statistics pertaining to actual hotel mortgages made by long-term permanent lenders. The American Council of Life Insurance, which represents 20 large life insurance companies, publishes quarterly information regarding the hotel mortgages issued by its member companies. Table 14.1 summarizes the average mortgage interest rate of the hotel loans made by these lenders. The Aa utility bond yield as reported by Moody's Bond Record is shown for purposes of comparison.

A close mathematical relationship exists between the average interest rate of a hotel mortgage and the concurrent yield on an Aa utility bond. Through regression analysis, this relationship is expressed as follows:

$$Y = 2.7561 + .79279X$$

where:

Y = Estimated hotel/motel mortgage interest rate

X = Current average Aa utility bond yield (coefficient of correlation is 95.5%)

If, for example, the current yield on Aa utility bonds, as reported by the Moody's Bond Record, is 9.8 percent, the above equation produces an estimated hotel/motel interest rate (Y) of 10.53 percent.

[2] Equity Component

The cost of the property not covered by first mortgage financing is normally met by an equity investor, who anticipates the receipt of all future benefits accruing to the equity position. These benefits include increasing annual dividends resulting from inflation, and, ultimately, equity build-up resulting from property appreciation and debt amortization.

¹ For a discussion of the equation, see *infra* 14.04[3]; see also Suzanne R. Mellen, "Simultaneous Valuation: A New Technique," *The Appraisal Journal*, April 1983, p. 165 for a detailed analysis of this technique.

TABLE 14.1
Typical Hotel and Motel Mortgage Rates

Year	Average ¹ interest rate	Moody's ² Aa utility bond
1987	9.94	9.77
1986	9.83	9.30
1985	12.27	12.06
1984	13.34	13.66
1983	12.93	12.84
1982	15.16	14.79
1981	14.53	15.30
1980	12.86	13.00
1979	10.83	10.22
1978	9.94	9.10
1977	9.79	8.43
1976	10.06	8.92
1975	10.34	9.44
1974	9.65	9.04
1973	9.10	7.79
1972	8.92	7.60
1971	9.70	8.00
1970	9.78	8.52

¹ Source: American Council of Life Insurance

² Source: Moody's Bond Record

The rate of return required by equity investors in the purchase of hotel properties must be based upon anticipated future earnings and cannot be accurately established solely from capitalization rates derived from sales and past operating history. This is particularly true in light of possible changes in the tax laws (e.g., lengthened depreciation schedules). Hotel appraisers continually review deal sheets pertaining to offerings of hotels and motels to stay informed regarding investor requirements. Public offerings provide the most supportable documentation for the rate of return required by hotel investors. A review of limited partnership offerings made subsequent to the passage of the Tax Reform Act of 1986, for example, indicates a typical range of guaranteed annual cash-on-cash returns of 9–12 percent to cumulative preferred annual cash-on-cash returns of 10–13 percent for equity investments in publicly traded limited partnership interests.

[3] Valuation of Components

The terms and loan-to-value ratio of current financing applicable to hotel properties can be fairly easily determined. However, the annual debt service and resultant net income to equity of a particular property cannot be calculated without knowing the total value of the property. In the past, property value was most often determined by forecasting net income available for debt service, and by calculating, through an iterative process, the amount of the mortgage that the net income was capable of supporting at an assumed interest rate and a specified loan-to-value ratio.

Property value can also be determined through a technique known as the simultaneous valuation formula. Given the known variables of equity investor yield requirements, two equations are set up to simultaneously solve for the unknown value, where

NI = Net income available for debt service
 V = Value
 M = Loan-to-value ratio
 R_e = Annual equity dividend rate
 f = Annual debt service constant
 d_e = Annual equity dividend
 $1/S^n$ = Present worth of \$1 factor (discount factor) at the equity dividend rate
 $S = 1 + i$, where i equals the interest or equity dividend rate ($R_e = i$)
 n = Projection period in years

The annual cash flow to equity (equity dividend) is expressed as the forecasted net income less annual debt service payments in the following equation:

$$\begin{aligned}
 NI^1 - (f \times M \times V) &= d_e1 \\
 NI^2 - (f \times M \times V) &= d_e2 \dots \\
 \dots (NI^n - (f \times M \times V))/R_e &= d_e n
 \end{aligned}$$

The value of the equity component is then expressed as the sum of the discounted annual cash flows in the following equation:

$$(d_e1 \times 1/S^1) + (d_e2 \times 1/S^2 + \dots + (d_e n \times 1/S^{n-1})) = (1-M)V$$

Like terms are combined to express the sum of the discounted cash flow after debt service as the value of the equity component:

$$\begin{aligned}
 ((NI^1 - (f \times M \times V)) 1/S^1) + ((NI^2 - (f \times M \times V)) 1/S^2) + \\
 \dots + (((NI^n - (f \times M \times V))/R_e) 1/S^{n-1}) = (1-M)V
 \end{aligned}$$

This combined algebraic equation (the simultaneous valuation formula) is then utilized to solve for the value of the subject property, given the forecasted net income stream and known return requirements of the debt and equity components.

[4] Ten-Year Internal Rate of Return Calculation and Discounted Cash Flow Analysis

In recent years, real estate investors and lenders have found it worthwhile to project the expected yield on investments or loans over an assumed 10-year holding period. This sort of assessment is usually accomplished by a 10-year internal rate of return calculation and discounted cash flow analysis that considers all of the before-tax components of a real estate investment (i.e., annual income dividends, property appreciation, and debt amortization).

The internal rate of return calculation assumes a sale at the end of the 10-year holding period. The sales price is calculated by capitalizing the 11th year's net income by an overall rate of 11 percent. This assumes that a seller or potential purchaser at the end of the 10th year will look forward to the forecasted 11th year net income to determine a sales or purchase price. The 11 percent overall "going-out" rate compares with an overall "going-in" rate (stabilized net income in current dollars divided by the property's value) of 10.76 percent. An increase is made in the overall rate to account for the added age of the property and the risk of forecasting ten years into the future.

A modified internal rate of return is calculated for each value component (i.e., debt, equity, and total property). It presumes that the cash flow thrown off by the property to that position is reinvested in an alternate investment (e.g., government bonds) that yields the same rate of return. Obviously, the higher the internal rate of

return, the greater the risk of not being able to attain the same yield from an alternate investment.

The modified internal rate of return calculation allows the appraiser to determine what the total property and equity yields would be if the annual cash flows to each position were reinvested in an investment generating a safer market rate of return. The 10-year internal rate of return calculations are illustrated in the case study at the end of this chapter.

14.05 **BREAK-EVEN ANALYSIS**

A break-even analysis identifies the point at which the level of sales for a lodging facility produces neither a profit nor a loss from operations. Basically, for hotels and motels the break-even point is the occupancy level at which all cash outlays necessary for the operation can be met. The break-even point can be established either before or after debt service, although most lenders require a calculation of the break-even point after debt service to determine the security of their loan.

The break-even occupancy level can be estimated by using a computerized analysis of the fixed and variable components of revenue and expense items. Programs have been written that are able to take an achievable occupancy percentage (and the corresponding operating ratios) established by an appraiser for a subject property and, through a series of steps, drop the occupancy level and automatically adjust the operating ratios to reflect the lower revenues that would be achieved. The calculations continue until the break-even point for occupancy, before and after debt service, is attained. The appraiser then compares the break-even figures with those for the projected stabilized year for the subject property in order to determine if there is enough leeway to cover debt service during low points in the occupancy cycle.

14.06 **FEASIBILITY**

The key to determining the economic feasibility of a lodging facility is the value estimate derived from the income capitalization approach. A new hotel is considered viable and feasible if the economic value of the hotel as determined by the income capitalization approach exceeds the total replacement cost for the facility by a wide enough margin so as to provide the developer and the investors in the project with a satisfactory profit.

The same type of feasibility analysis is carried out each time a hotel is bought or sold. Essentially, the buyer performs an analysis based on the income capitalization approach and establishes a maximum price that he or she is willing to pay. If the selling price demanded by the seller is less than the value set by the buyer's analysis, the deal is made.

CASE STUDY Property Valuation

COST APPROACH

The proposed Spring Valley project will be a newly constructed facility, so significant physical deterioration is not expected to occur for some time. In addition, the facility will be well-designed, so built-in functional obsolescence will not be a depreciation factor. Finally, there is no foreseeable reason for external obsolescence in the form of an impairment of the desirability or useful life of the subject property. Therefore, for valuation purposes, no overall deduction need be made to the estimated replacement cost for the property.

Replacement Cost

The following estimate of the replacement cost for property improvements, which includes buildings, parking facilities, landscaping, and signage, has been derived from a national reference source on replacement cost information. This estimate does not take into account the cost of replacing FF&E, opening costs, developer's costs, or any soft costs other than those for architecture and engineering.

Cost per square foot		\$76.72
Current cost multiplier	×	1.04
Local multiplier	×	<u>1.02</u>
Total building cost per square foot		\$81.39

Based on the recommended facilities, the total square footage of the proposed subject property should range between 170,000 and 190,000 square feet, or an average of 180,000 square feet. Multiplying the total area (180,000 square feet) by the total building cost per square foot (\$81.39) results in the total improvement cost estimate:

Total building area in square feet		180,000.00
Building cost per square foot	\$	<u>81.39</u>
Total improvement cost		\$14,650,000.00

The other costs that must be accounted for are as follows:

FF&E

Price per room	\$	15,000
Number of rooms	×	<u>300</u>
		\$4,500,000

Soft costs

Appraisal fees	\$	30,000
Financing fees		316,000
Interest during construction		1,291,000
Legal		30,000
Miscellaneous		91,000
Property taxes		50,000
Surveys		15,000
Fees and permits		<u>100,000</u>
Total soft costs		\$1,923,000

Opening costs

Preopening costs	\$	600,000
Operating reserve		1,200,000
Working capital		200,000
Initial franchise fee		<u>90,000</u>
Total opening costs		\$2,090,000

Developer's costs \$ 587,000

Land Value

The proposed subject property appears to represent the highest and best use of the property, so the ground lease approach has been used to value the land.

Actual long-term ground leases encumbering hotels were researched, and emphasis was given to rental formulas based entirely on a percentage of rooms revenue or a combination of rooms, food, and beverage revenue. Table 1 summarizes these findings, showing the hotel, its room count, and the rental formula used. The last two columns of the table show the yield when the ground rental formula of the listed hotel is directly applied to the forecasted revenues for the proposed subject property as of its stabilized year. The total ground rental is then expressed both as a dollar amount and as a percentage of rooms revenue.

The analysis of these and other hotel ground lease rental formulas indicates that economic ground rents for hotels similar to the proposed subject property typically range from 3 to 7.2 percent of total rooms revenue. This range is quite broad, but most of the formulas cluster around 3 to 5 percent of rooms revenue.

Based on the calculations using the comparable ground leases and taking into consideration the loca-

(continued on page 14-11)

HOTEL DEVELOPMENT OR ACQUISITION

TABLE 1
Long-Term Hotel Ground Leases

Location	Number of rooms	Ground lease structure	Rental based on forecast of 300-unit subject property stabilized year											
			Dollar amount	Percent of rooms revenue										
Marriott Hotel Tampa, Florida	312	3% rooms revenue 1% food revenue greater of 1% of alcoholic beverage revenue or \$96,000	\$332,360	3.7%										
Marriott Hotel Albuquerque, New Mexico	414	greater of 3.5% of rooms revenue or \$155,000 for the 1st ten years, and \$165,000 thereafter	314,475	3.5										
Marriott Hotel Denver, Colorado	302	greater of \$160,000 or 3% of rooms revenue escalating to 4% in the 7th year of initial term; if the hotel is expanded, percentage rent increases to 5% of annual rooms revenue	269,550	3.0										
Marriott Hotel Greensboro, North Carolina	302	2.25% of rooms revenue, plus 2% of gross alcoholic beverage revenue, plus 1% of food revenue against a minimum rental as follows: <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Year</th> <th>Minimum rent</th> </tr> </thead> <tbody> <tr> <td>1-3</td> <td>\$ 90,000</td> </tr> <tr> <td>4-6</td> <td>100,000</td> </tr> <tr> <td>7-9</td> <td>110,000</td> </tr> <tr> <td>10-term</td> <td>127,000</td> </tr> </tbody> </table>	Year	Minimum rent	1-3	\$ 90,000	4-6	100,000	7-9	110,000	10-term	127,000	284,163	3.2
Year	Minimum rent													
1-3	\$ 90,000													
4-6	100,000													
7-9	110,000													
10-term	127,000													
Marriott Plaza Venetia Miami, Florida	605	\$800,000 minimum rent against 4% of rooms revenue, plus 3% of food and beverage revenue for the first two years of operation; after that, minimum rent of \$1,000,000 against percentage	547,830	6.1										
Marriott Houston Med. Ctr. Houston, Texas	417	greater of \$160,000 or 3% of the 1st \$15,000,000 of rooms revenue, plus 3.25% of rooms revenue in excess of \$15,000,000	269,550	3.0										
Bahia Mar Hotel Ft. Lauderdale, Florida	297	greater of \$150,000 or 4% of total revenue	650,360	7.2										
Kauai Holiday Inn Waipouli, Kawaihau, Hawaii	311	3% of rooms revenue 1% of food and beverage revenue 10% of sublease and concession rentals	386,660	4.3										
Hilton Inn Airport El Paso, Texas	272	greater of \$5,000/month or: 5% rooms revenue 4% beverage revenue 2% food revenue 6% other income	645,830	7.2										
Marriott Inn Trumbull, Connecticut	320	\$200,000 or 3% of rooms revenue	269,550	3.0										
Marriott Hotel Huntsville, Alabama	290	greater of \$120,000 or 4% rooms revenue plus 2% beverage revenue	398,780	4.4										
Ramada Inn Fayetteville, North Carolina	136	greater of \$18,000 or 5% rooms revenue	449,250	5.0										

PROPERTY VALUATION

ational attributes of the proposed subject property, the appropriate economic ground rental formula is estimated to be 3 percent of total rooms revenue. This equates to the following economic ground rent:

Stabilized rooms revenue	\$8,985,000
Rental percentage	<u>.03</u>
Economic ground rent	\$ 269,550

Rental generated from a ground lease represents a low-risk flow of income. Tenant improvements typically amount to more than eight times the value of the land, so the risk of default is almost nonexistent. For hotel ground leases where rental is tied to rooms revenue, the landlord is also protected from the adverse effects of inflation. Based on these minimal risk factors and the current cost of long-term capital, an appropriate ground rental overall capitalization rate for the subject property would be 10.5 percent.

Applying the indicated capitalization rate to the subject property's economic ground rent results in the following estimate of land value:

$$\frac{\text{Economic ground rent}}{\text{Capitalization rate}} = \frac{\$269,550}{.105} = \$2,567,142$$

Estimated land value \$2,600,000

Land value for a lodging facility typically ranges between 10 and 20 percent of the total value. The above estimate of land value is 8.4 percent of the total property value indicated by the income capitalization approach. The estimate, which is slightly below the typical range, reflects the suburban nature of the subject property.

Combining the improvement cost, the FF&E cost, soft costs, opening costs, developer's costs, and land value produces the total replacement cost for the proposed Spring Valley hotel.

Improvements	\$14,650,000
FF&E	4,500,000
Soft costs	1,923,000
Opening costs	2,090,000
Developer's costs	587,000
Land value	<u>2,600,000</u>
Total replacement cost	\$26,350,000

To estimate the market value by the cost approach, the profit realized by the developer must be added to the total replacement cost. Assuming a developer would be satisfied with a profit equal to 17.5 percent of the total replacement cost, the market value by the cost approach would be:

Total replacement cost	\$26,350,000*
Developer's profit	× <u>1.175</u>
	\$30,961,250
Indicated market value by cost approach (rounded)	\$31,000,000

INCOME CAPITALIZATION APPROACH

Mortgage Component

Based on an analysis of the current lodging industry mortgage market, and adjusting for specific factors such as the property's location, local hostelry market conditions, age, and operating history, it appears that a 10.5 percent interest, 30-year amortization mortgage with a .109769 debt service constant would be appropriate for the proposed subject property. A mortgage lender would probably find it worthwhile to lend up to 75 percent of the subject's market value as determined by this appraisal.

Equity Component

Given the assumed 75 percent loan-to-value ratio, the age, condition and anticipated market position of the subject property, as well as the risk inherent in achieving the projected income stream, an equity investor will probably require a 10.5 percent average annual cash-on-cash return over a three-year build-up to a stabilized year of operations.

Valuation of Mortgage and Equity Components

The property's value can also be solved directly by using the simultaneous valuation formula. Given the known variables of equity investor yield requirements, two equations are set up with the following values assigned to the variable components for the subject property:

- M = 75% loan-to-value ratio
- R_e = 10.5% equity dividend rate
- f = .109769 debt service constant
- 1/Sⁿ = discount factor at equity dividend rate of 10.5%

	<u>Forecasted net income</u>
NI ¹ =	\$1,380,000
NI ² =	2,588,000
NI ³ =	3,679,000

The formula is then applied to the subject property's forecasted net income as follows:

Intermediary calculation

$$(f \times M \times V) = .109769 \times .75 \times V = .082327V$$

Expressing formula in terms of V

$$(1,380,000 - .082327V) \times .0904977 + (2,588,000 - .082327V) \times .8189840 + ((3,679,000 - .082327V)/1.105) \times .8189840 = (1 - .75V)$$

Like terms are combined and the equation is solved for V

$$\begin{aligned} 32,064,041 - .784062V &= (1 - .75)V \\ 32,064,041 - .784062V &= .25V \\ 32,064,041 &= 1.03406V \\ V &= 32,064,041/1.03406 \\ V &= \$31,007,844 \end{aligned}$$

Indicated market value by the income approach (rounded) \$31,000,000

Proof of Value

The simultaneous valuation formula calculates the value of the mortgage and equity components, which derive their desired rates of return from the forecasted net income. The following calculations prove this hypothesis:

	<i>Assumed terms</i>
Mortgage component	
Percentage of total value	75%
Interest (rate of return)	10.5%
Mortgage constant	109769
Equity component	
Percentage of total value	25%
Equity dividend (rate of return)	10.5%

The allocation of the indicated market value between the mortgage and equity components is as follows:

Mortgage component (75%)	\$23,250,000
Equity component (25%)	<u>7,750,000</u>
Indicated market value	\$31,000,000

The annual debt service is the mortgage component multiplied by the mortgage constant:

Mortgage component	\$23,250,000
Mortgage constant	<u>.109769</u>
Annual debt service	\$ 2,550,000

The net income to equity (equity dividend) is the forecasted net income less the debt service. Upon deducting debt service, the mortgage component's rate of return requirements are fulfilled, establishing the value of the mortgage component.

	1987	1988	Stabilized
Net income	\$ 1,380,000	\$2,588,000	\$3,679,000
Less: Debt service	<u>2,550,000</u>	<u>2,550,000</u>	<u>2,550,000</u>
Net income to equity	\$(1,170,000)	\$ 38,000	\$1,129,000

The value of the equity component is calculated by capitalizing the stabilized net income to equity at the equity dividend rate. This stabilized, or reversionary, value is then discounted to the date of value at the equity dividend rate. The net income to equity for each of the intervening build-up years is also discounted to the date of value. The sum of these discounted values equates to the value of the equity component.

Stabilized equity value

$$\frac{\$1,129,000}{.105} = \$10,752,000$$

The discounted value of the stabilized equity value and the net equity during the intervening build-up years are as follows:

Year	<i>Forecasted net to equity and stabilized equity value</i>	<i>Discount rate @ 10.5%</i>	<i>Discounted value</i>
1987	\$(1,170,000) ×	.905273	= \$(1,059,000)
1988	38,000 ×	.819520	= 31,000
Stabilized	10,752,000 ×	.819520	= <u>8,812,000</u>
			\$ 7,784,000

Value of the equity component (rounded) \$ 7,750,000

This proof demonstrates that the forecasted net income is exactly sufficient to pay the required debt service on a \$23,250,000 mortgage and provide a 10.5 percent cash-on-cash equity dividend on an \$7,750,000 equity investment. The sum of the \$23,250,000 mortgage component and \$7,750,000 equity component results in the \$31,000,000 indicated market value by the income approach.

TEN-YEAR INTERNAL RATE OF RETURN CALCULATION AND DISCOUNTED CASH FLOW ANALYSIS

The following cash flow analysis is based upon the ten-year projection of net income found in Table 2. The subject property's net income before debt service is projected forward for ten years, from 1990 through 1999, based on the forecast of income and expense. The ratio of net income before debt service to total revenue is assumed to remain constant from the stabilized year (1992) forward. An overall inflation

PROPERTY VALUATION

TABLE 2
Ten-Year Forecast of Net Income to Equity for Proposed Hotel (in thousands)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Number of rooms	300	300	300	300	300	300	300	300	300	300
Occupancy	59.0%	67.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%	72.0%
Average rate	\$ 93.10	\$ 103.07	\$ 113.96	\$ 119.66	\$ 125.64	\$ 131.92	\$ 138.52	\$ 145.45	\$ 152.72	\$ 160.35
Rooms revenue	6,015	7,562	8,985	9,434	9,906	10,401	10,921	11,467	12,040	12,642
Net income before debt service	1,380	2,588	3,679	3,863	4,056	4,259	4,472	4,696	4,931	5,178
Debt service	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550
Net income to equity	<u>(\$1,170)</u>	<u>\$ 38</u>	<u>\$1,129</u>	<u>\$1,313</u>	<u>\$1,506</u>	<u>\$1,709</u>	<u>\$1,922</u>	<u>\$2,146</u>	<u>\$2,381</u>	<u>\$2,628</u>

rate of 5 percent per year is applied to both revenue and expense; therefore, net income increases annually at 5 percent.

The internal rate of return calculation assumes a sale at the end of the ten-year holding period. The sales price is calculated by capitalizing the eleventh year's net income by an overall rate of 11 percent. This assumes that a seller or potential purchaser at the end of the tenth year will look forward to the forecasted eleventh year net income to determine a sales or purchase price. The 11 percent overall "going-out" rate compares with an overall "going-in" rate (stabilized net income in current dollars divided by the property's value) of 10.76 percent. An increase is made in the overall rate to account for the added age of the property and the risk of forecasting ten years into the future.

The net proceeds to equity upon sale of the property is determined by deducting sales expenses (brokerage and legal fees) and the outstanding mortgage balance:

Eleventh year net income	\$ 5,437,000
Overall capitalization rate	.11
Gross sales proceeds	49,427,000
Less: Brokerage and legal @ 3%	1,483,000
Outstanding mortgage balance	21,308,000
Net proceeds to equity	\$26,636,000

The total property yield (before debt service), yield to the lender, and yield to the equity position are as follows:

Position	Value	Projected yield (internal rate of return) over 10-year holding period
Total property	\$31,000,000	14.1%
Lender	23,250,000	10.5
Equity	7,750,000	20.0

Based on the quality of the proposed subject property, its location, competitive environment, and all factors impacting the economic viability of the project, these internal rates of return appear to be reasonable. The discounted cash flow procedure substantiating the yield to each position is shown in Table 3.

Modified Internal Rate of Return

The modified internal rate of return has been calculated for the subject property assuming a reinvestment rate of 12 percent. The modified internal rate of return for the total property and the equity position of the subject property over the assumed ten-year holding period are 13.6 percent for the total property value and 19.1 percent for equity value assuming a reinvestment rate of 12 percent.

TABLE 3
Internal Rates of Return for Proposed Hotel

Total property yield (IRR 14.1%)

Year	Net income before debt service		Present worth of \$1 @ 14.1%	Discounted cash flow
1990	\$ 1,380,000	x	.876063	= \$ 1,209,000
1991	2,588,000	x	.767487	= 1,986,000
1992	3,679,000	x	.672367	= 2,474,000
1993	3,863,000	x	.589036	= 2,275,000
1994	4,056,000	x	.516033	= 2,093,000
1995	4,259,000	x	.452078	= 1,925,000
1996	4,472,000	x	.396049	= 1,771,000
1997	4,696,000	x	.346964	= 1,629,000
1998	4,931,000	x	.303962	= 1,499,000
1999	53,122,000 ¹	x	.266290	= 14,146,000
Total property value				\$31,007,000

¹ 10th year net income before debt service of \$5,178,000 plus sale proceeds of \$47,944,000

(continued)

TABLE 3 (continued)

Mortgage component yield (IRR 10.5%)

Year	Debt service		Present worth of \$1 @ 10.5%	=	Discounted cash flow
1990	\$ 2,553,000	×	.905274	=	\$ 2,331,000
1991	2,553,000	×	.819521	=	2,092,000
1992	2,553,000	×	.741891	=	1,894,000
1993	2,553,000	×	.671614	=	1,715,000
1994	2,553,000	×	.607995	=	1,552,000
1995	2,553,000	×	.550402	=	1,405,000
1996	2,553,000	×	.498264	=	1,272,000
1997	2,553,000	×	.451066	=	1,152,000
1998	2,553,000	×	.408338	=	1,042,000
1999	23,861,000 ²	×	.369658	=	8,820,000
Value of mortgage component					\$23,256,000

² 10th year debt service of \$2,553,000 plus outstanding mortgage balance of \$21,308,000

Equity component yield (IRR 20.0%)

Year	Net income to equity		Present worth of \$1 @ 20.0%	=	Discounted cash flow
1990	\$ (1,173,000)	×	.833644	=	\$ (978,000)
1991	35,000	×	.694962	=	24,000
1992	1,126,000	×	.579350	=	652,000
1993	1,310,000	×	.482972	=	633,000
1994	1,503,000	×	.402626	=	605,000
1995	1,706,000	×	.335647	=	573,000
1996	1,919,000	×	.279810	=	537,000
1997	2,143,000	×	.233262	=	500,000
1998	2,378,000	×	.194457	=	462,000
1999	29,261,000 ³	×	.162108	=	4,743,000
Value of equity component					\$7,752,000

³ 10th year net income to equity of \$2,625,000 plus net sale proceeds to equity of \$26,636,000

The lowered yields to each position reflect the impact of a more conservative reinvestment rate of 12 percent. The yields to each position remain strong under this assumption and indicate the underlying strength of the investment.

Property Appreciation

Based on the discounted cash flow analysis, the value of the subject property is estimated to increase at an annual compound rate of 4.8 percent per year over the assumed ten-year holding period, resulting in a total property appreciation of 59 percent. This appreciation rate is conservative and reasonable when compared with the assumed annual inflation rate of 5 percent.

TABLE 4

Break-even Points for Proposed Hotel

	After debt service	Before debt service
Number of rooms	300	300
Occupancy	64%	44%
Average rate	\$113.96	\$113.96
Revenues		
Rooms	\$ 7,927	\$ 5,539
Food	4,050	3,348
Beverage	1,782	1,473
Telephone	403	295
Other income	511	437
Total	\$14,673	\$11,092
Departmental Expenses		
Rooms	\$ 1,949	\$ 1,757
Food and beverage	4,460	4,123
Telephone	383	344
Other income	314	292
Total	\$ 7,106	\$ 6,516
Departmental Income	\$ 7,567	\$ 4,576
Undistributed Operating Expenses		
Administrative and general	\$ 1,291	\$ 1,202
Management fee	440	333
Marketing	776	722
Property, operations, and maintenance	742	673
Energy	696	681
Total	\$ 3,945	\$ 3,611
Income Before Fixed Charges	\$ 3,622	\$ 965
Fixed Charges		
Taxes	\$ 479	\$ 479
Insurance	153	153
Reserve for replacement	440	333
Total	\$ 1,072	\$ 965
Net Income Before Debt Service	\$ 2,550	\$ 0
Debt Service	\$ 2,550	
Net Income After Debt Service	\$ 0	

Return Components

In evaluating the risk associated with an investment, it is useful to determine the portions of a property's value that are attributable to annual cash flow and reversionary proceeds upon sale. The larger the percentage of value attributable to reversionary proceeds, the greater the risk, because the projected sales price of a property and the resulting appreciation is at best uncertain at the end of the assumed ten-year holding period.

PROPERTY VALUATION

Based upon the ten-year discounted cash flow analysis in Table 3, a calculation shows that 58.8 percent of the property's estimated value is attributable to cash flow and 41.2 percent is attributable to property appreciation. These percentages, which typically fall within the range of 55 to 65 percent for cash flow and 35 to 45 percent for appreciation, are reasonable for a property of this nature.

Debt Coverage Ratio

The projected net income before debt service provides for a debt coverage ratio (net income divided by debt service) of 1.44 in the stabilized year of operation. Lenders active in hotel financing are currently requiring debt coverage ratios of between 1.25 and 1.45 in the stabilized year of operation. The subject's projected debt coverage ratio of 1.44 in the stabilized year is at the high end of this range and provides a reasonable margin of cash flow to cover annual debt service.

BREAK-EVEN ANALYSIS

The break-even occupancy level for the subject property has been estimated using the occupancy, average rate, and operating ratios for the property's stabilized year. The income and expense statement

shown in Table 4 sets forth the break-even points for the subject property before and after debt service, which is calculated as follows:

Mortgage component	\$23,250,000
Mortgage constant	<u>.109769</u>
Annual debt service	\$ 2,550,000

The proposed subject property will require a 64 percent occupancy to break even after debt service, and a 44 percent occupancy level to cover all operating expenses and break even before debt service. With a projected stabilized occupancy level of 72 percent a sufficient cushion exists to cover debt service during the normal cyclical occupancy trends experienced by area lodging facilities.

FEASIBILITY

The cost approach and income approach have established that the proposed Spring Valley hotel has a total replacement cost of \$26,350,000 and a total economic value of \$31,000,000. When the project is complete and has an economic value of \$31,000,000, the developer's profit will be 17.5 percent of the total replacement cost, which is a sufficient margin of profit, and so the proposed Spring Valley hotel can be deemed economically feasible.