Direct Capitalization vs. Yield Capitalization: Appraisal of Public Utility Property

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Direct capitalization and yield capitalization are new names for capitalization methods that have been around for years. All of the traditional capitalization methods used in the income approach belong to one of these categories. For example, annuity capitalization and discounted cash flow capitalization can be classified as forms of yield capitalization. Traditional straight capitalization and capitalization using a gross income multiplier are forms of direct capitalization. The two categories are distinguished by the income to be capitalized and the rate used in the capitalization process.

Because the equity dividend rate and equity yield rate are the same for regulated public utilities, either method, direct or yield capitalization, is appropriate. But direct capitalization, using capitalization rates derived from comparable sales, is almost never used for the appraisal of regulated rate base public utility properties for the same reason the comparable sales approach is almost never used—because of the lack of truly comparable sales.

Direct Capitalization

Direct capitalization converts one year's income into a value indication either by dividing the income (usually the income for the first year of the holding period) by an income rate or multiplying it by an income factor derived from the market. The return on and of capital is implicit in this method because the income rates and factors express the relationship of income and value and are derived from market data (comparable sales).

It is essential that the market comparables reflect risk, income, expenses, and physical and locational characteristics similar to those of the property being appraised.

Capitalization Rates

Several income rates can be used—the overall capitalization rate, the mortgage capitalization rate, the equity capitalization rate, the land capitalization rate, or the building capitalization rate. The factors for capitalizing income into value include the gross income multiplier, potential gross income multiplier, and the effective gross income multiplier.

Rates can also be derived by the band-of-investment technique applied to mortgage and equity components, using the mortgage constant (ratio of annual debt service to the total amount of debt) and the equity dividend rate (ratio of equity dividend to total equity). In addition, overall capitalization rates can be derived from gross income multipliers, debt coverage formulas, and the band-of-investment technique using the land and building components of the total investment.

The key to understanding direct capitalization is that the equity dividend rate must be properly matched with the income. If the anticipated income is to be capitalized, the anticipated equity dividend rate must be used as the equity component in the overall capitalization rate.

Effect of Noncomparable Sales

Direct capitalization, in the traditional sense, is almost never used in the appraisal of regulated rate base public utility properties for the same reason that the comparable sales approach is almost never used—the lack of truly comparable sales. The appraiser of public utilities should never use a conglomerate sale from which to derive an overall capitalization rate or even an equity rate when he is appraising just the operating properties of a regulated public utility. There usually are not enough valid arm's-length sales to render a supportable conclusion of market value. In order to use either direct capitalization (or the comparable sales approach), the appraiser must overcome the almost insurmountable hurdle of finding arm's-length sales of highly comparable properties with the same investor motivation, debt-equity ratios, cost of debt and equity, real and personal property mix, remaining economic life, depreciation rate, expense ratios, land-to-building ratios, customer mix (jurisdictional/non-jurisdictional), desirability, and the same risk rate as the subject.

Example 1 demonstrates that even though two seemingly comparable properties may have the same sale price, the ratio of land to building will affect the overall rate even when the discount rate (weighted property interest rate) and the recapture rate are the same.

Income and expense ratios for sale properties must be highly comparable to ratios for the subject property being appraised. Example 2 demonstrates that two sale properties with comparable gross incomes and resulting identical gross income multipliers have significantly different overall capitalization rates due to differences in expense ratios.

The comparable sales properties and the subject property must also have similar remaining economic lives. Example 3 shows how a change in the recapture rate (reciprocal of remaining economic life) affects the overall rate. The derivation of overall rates from properties that are not comparable in all respects to the subject property will result in invalid overall rates. Thus the derivation of overall rates from conglomerate sales or from sales of public utilities can almost never be successfully used in the appraisal of operating properties of public utilities. Any mismatch of these or other critical elements renders the sale property useless as a guide to the subject property's value.

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Example 1

Effect of Land-to-Building Ratio on Overall Rate

	Sale #1	Sale #2
Sale price	$200,000,000	$200,000,000
Land value	100,000,000	50,000,000
Improvement value	100,000,000	150,000,000
Discount rate	10%	10%
Recapture rate (20 years)	5%	5%
Return on land and improvements	$20,000,000	$20,000,000
Recapture (Deprec.)	5,000,000	7,500,000
Total net income before recapture required	$25,000,000	$27,500,000
Overall rate	12.50%	13.75%

Example 2

Effect of Expense Ratio on Capitalization Rate

	Sale #1	Sale #2
Gross income	$100,000,000	$100,000,000
Expenses	30,000,000	40,000,000
Expense ratio	30%	40%
Net income before recapture	$70,000,000	$60,000,000
Sales price	$600,000,000	$600,000,000
Gross income multiplier	6.0	6.0
Overall rate	11.67%	10.00%

Example 3

Effect of the Recapture Rate on the Overall Rate

	Property #1	Property #2
Annual recapture rate	5%	2%
Discount rate	10.0%	10.0%
Improvement capitalization rate	15.0%	12.0%
Improvement component (80%) of overall rate	12.0%	9.6%
Land component (20%) of overall rate	2.0%	2.0%
Overall rate	14.0%	11.6%

The traditional method used by appraisers of utility and railroad properties was once referred to as the straight-line capitalization method using the property residual technique. This method is also known as capitalization in perpetuity and incorporated under the broad definition of direct capitalization in *The Appraisal of Real Estate* (American Institute, 1983). The straight-line method, the most widely used method nationwide for appraising public utility property, requires deducting depreciation expense (recapture) from the net income before recapture (NIBR) and then capitalizing the remaining net operating income (return on income) at the property interest rate (also known as the property discount rate).

Yield Capitalization

Yield capitalization converts all future net benefits into present value. Yield capitalization procedures include the use of present value factors, discounted cash flow analysis, and the application of capitalization rates. Mortgage-equity formulas and yield rate/value change formulas may be used to derive overall capitalization rates. As in direct capitalization, residual techniques also may be used.

Historical yield rates derived from comparable sales are noteworthy, but because they reflect past, not future, benefits in the mind of the investor, they are not reliable current yield indicators. Discounted cash flow capitalization can be used with level, increasing, decreasing, or deferred annuities. Other yield capitalization methods include sinking fund and annuity capitalization. Overall capitalization rates, as well as land, building, mortgage, and equity residual techniques, may be used. Overall rates are used in lieu of discounting when the pattern of the income flows is systematic and when the reversion is specified as a percentage change from the original investment, rather than estimated as a specific income amount.

This technique permits the conversion of a single year's income into value using the formula

$$V = I/R. \qquad (1)$$

The formula used to convert income to value in this yield capitalization procedure is identical to the one used in direct capitalization (Appraisal Institute, 1983, pp. 388 and 423). The formula for the overall rate used in yield capitalization is

$$OAR = \gamma - \Delta a \qquad (2)$$

where

OAR = overall capitalization rate,
γ = discount rate,
Δ = delta, the expected change in the value of the property over the projection period, and
a = the annualizer, which converts the total change in capital value over the projection period to an annual change.

The appraiser can use either method and still produce a valid appraisal of a regulated public utility. So why all the fuss? The arguments center on two problems: how to match the proper income with the proper rate and whether or not the equity rate has a growth component in it. Much of the argument in this entire issue relates to whether an equity dividend rate or an equity yield rate should be used for the equity rate component in the capitalization rate.

If the income to be capitalized has no growth built in, then direct capitalization using an equity rate with no growth in it can be used. Direct capitalization in its traditional form is usually much harder to support because it requires very similar comparable sales in order to derive the proper direct capitalization rate and because most public utility income streams have "growth" (value change) automatically built into them.

Typically the net operating income of a rate base public utility company has a "growth" component built into it already

as a result of the method of computing equity cost by the regulatory agencies. Although the net operating income of a rate base utility cannot technically grow, the income does perforce have a "growth" factor built in resulting from the rate of return allowed by the regulatory agencies, which was primarily based on the discounted cash flow method of determining the opportunity cost of equity capital.

Most disagreements center on the proper equity rate to use in our appraisal of rate base utilities. Should we use the equity divident rate or should we use the equity yield rate? Normally the answer to that question depends on the income to be capitalized. In the case of public utilities, we usually capitalize the net operating income after the deduction of depreciation expense. For public utilities the equity dividend rate and the equity yield rate are theoretically the same.

Because public utility rate bases do not appreciate, there is no chance for the equity position to receive any benefit other than income during the economic life of the operating improvements. If the only benefit is equity income, and the investment is written off on a straight-line basis, then the equity dividend rate and the equity yield rate are identical. Stated another way, when the capital investment (or rate base) remains constant or depreciates by a specific percentage rate annually, the equity dividend rate and the equity yield rate are identical.

When estimating the appropriate equity rate by a discounted cash flow model, risk premium analysis, a capital asset pricing model, or an earnings-to-price ration, the appraiser is attempting to determine the opportunity cost of capital. It appears that only when the discounted cash flow method is used for estimating the cost of equity is their any confusion over this matter. The discounted cash flow model has a "growth" component included in its calculations. This "growth" component is added to the current divident yield (not to the current earnings yield) to indicate the total equity yield. The surrogate for growth in a stock's value is the "growth" in dividends, earnings, book value, or some other indicator.

All measures of equity cost measure opportunity cost of capital. For a public utility to compete in the capital markets, the public utility has to be allowed to earn an equity rate commensurate with the return expected for other investment opportunities (whether those opportunities are regulated properties or not) with a similar risk. Nonregulated investments have no restrictions on rate base. In fact they have no rate base nor do they have to get permission to charge a specific price for their services. Neither is their earning potential limited to a rate base which automatically declines each year in a manner prescribed by the regulatory agency. Thus, nonregulated investments, which have no earnings limitations, have the opportunity for real growth or appreciation; rate base utilities do not have that opportunity. Therefore, the public utility, whose rate base cannot grow due to automatic depreciation of its rate base, must capture all of its potential benefits each and every year of its existence in its income stream. Since there is no potential for real growth, and the rate base is depreciated on a straight-line basis each year, the equity yield rate is the same as the equity dividend rate. If the equity dividend rate and the equity yield rate are identical, then the question becomes moot as to which capitalization method—direct capitalization or yield capitalization—is appropriate.

The appraiser must realize the effect of regulation on the property he is appraising in order to estimate effectively the fair market value. One cannot assume that a public utility property will react to inflationary pressures in the same way as nonregulated properties. A thorough understanding of real property appraisal, the regulations affecting public utility properties, and the effect of those regulations on value, is essential to the understanding of the proper appraisal techniques applicable to public utility properties. (IRWA)

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Reference

American Institute of Real Estate Appraisers. The Appraisal of Real Estate, 8th ed. Chicago: Author, 1983.