

CAPITALIZATION

In Real Estate Valuation

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By

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notes

Also see the following on this topic:

1. Arizona Department of Revenue, Property Tax Division: ASSESSMENT PROCEDURES MANUAL, Part Two, Chapter One, "Approaches to Value" particularly page 2.1.18 and following.
2. The Appraisal of Real Estate, 14th ed (text) published by The Appraisal Institute, Chicago, IL. See particularly Chapters 21-26, and Addenda page 753.

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notes

Direct Capitalization

Using the Ratio Model:

$$V = I / R$$

Income Capitalization Approach to value consists of methods, techniques, and mathematical procedures that an appraiser uses to analyze a property's capacity to generate benefits [usually monetary benefits of income and reversion] and convert these benefits into an indication of present value.

Capitalization – converting one or more benefits to be received in the future, into a single capital amount (present or date of valuation).

Capitalization Models

STATIC MODEL	DYNAMIC MODEL
$V = I / R$	DCF. $V = PWCF_1 + PWCF_2 + \dots + PW(CF_n +$ Reversion to equity at end of forecast period)
Premise: Value = the Relationship between Income and Value found in the market applied to the subject actual or estimated income.	Premise: Value = Present worth future annual quantified benefits
One Income. Typical or first year of new ownership	Multiple Incomes. Specify multiple years' anticipated income; may be variable, positive – negative mixed.
Net Operating Income before debt service.	Net Operating Income before debt service.
Forecasting needed: Limited	Forecasting needed: Extensive forecasting of income and expenses.
Rate is from Market Data, $R = I / \text{Value}$ by sales price. (or alternate methods including 1. band-of-investment, 2. debt coverage formula, or 3. multipliers and income ratios.)	Rate is a discount rate, cumbersome to extract from the market and support.

Value in the income approach is based on the notions that

1. Value is the present worth of anticipated benefits (monetary; usually stream plus reversion).
2. there is a relationship between income and monetary benefit productivity and value.

The Basic “Ratio” Capitalization Model:

Value = Income divided by Rate. $V = I / R$

The simplest and most frequently used is this ratio model; a statement of relationship between income and value. It may be used in valuing an investment position:

Value can be found if we know the buyer’s expected income and the market relationship between income and value, i.e. Rate.

Income is the subject actual Net Operating Income or the estimated market Net Operating Income.

Rate is the relationship between income and value. **Rate = Income / Value.** It is known as simply the Rate, or Overall Rate, or Income Rate.

Where to get it: from the market. It is also referred to as Overall Rate “R” or “Ro.”

One income. One rate. One value.

Further,

To find **income** necessary to provide a return on the asset of specified value, the model is:

$$\mathbf{I = V * R}$$

.....and to extract **rate**, Value and Income must be known for the model

$$\mathbf{R = I / V.}$$

Sources for The Rate in the $V= I / R$ Model

(aka "Overall Rate" for the whole real property entity; or rate for an investment position or component)

Sources and methods of calculating Rate:

- 1 Comparable Sales Method.** Aka market extraction. Extraction from market data, properties which have recently sold with known net operating income (actual or expected by the buyer-investor).

Rate = (Income) / (Value represented by sales price); ie $R=I/V$

<u>Sale</u>	<u>Price</u>	<u>Imp. SF</u>	<u>\$/SF</u>	<u>Net Op. Inc</u>	<u>Rate</u>
1	670,000	4,000	\$ 167.50	68,000	0.10149
2	925,000	6,100	151.64	84,000	0.09081
3	855,000	5,800	147.41	85,000	0.09420
4	770,000	5,200	148.07	78,500	0.10195
<i>Mean</i>	<i>805,000</i>	<i>5,275</i>	<i>152.60</i>	<i>78,125</i>	<i>0.09711 = 0.097</i>

Check/Analyze: age, condition, site coverage ratio, improvements contribution, expense ratio, immediate market outlook, sale financing terms, sale condition, market conditions at time of sale vs. date of valuation, similarity of improvement size and type, risk, etc.

Note:

Current active competitive listings may also be included. (This is especially helpful in a slow market with fewer sales than in a normal more active market). The listings, after appropriate comparison to the subject, tend to indicate the upper limit of price, and thus the lower limit of Rate.

This can help from over-valuing a property or misreading what is an appropriate rate when fewer and older sales are used.

The listings must be confirmed, just as the sales, with the same level of detail for proper comparisons. The listings are NOT included increase value or decrease rate! They may be helpful in finding prices and rates, for example, for which properties are not selling to provide some limits for the appraiser.

Comparable Sales Method. Aka market extraction, *continued.....*

Advantages of the extraction of rate from comparable sales:

1. Simple, easy to understand.
2. Logical to obtain information, NOI and NOI/SF check, and Rate from the market to estimate market value.
3. Simple net operating income for comparables normally easier to obtain than more detailed breakdown of types of income and itemized expenses. PGI and NOI often shown on listings as a starting point when confirming the sales data.

Disadvantages of the extraction of rate from comparable sales:

1. Must have highly similar comparables (physical similarity, age-condition, lease terms, site coverage and improvements contribution, lease terms (who pays what expenses, vacancy and re-leasing timing, and such).
2. All significant differences must be analyzed in the selection of the rate – i.e. the rate is not a simple or weighted average of those found in the comparable sales.
3. Reliable data, consistent with subject may be difficult to obtain; particularly data with same income basis as subject income the rate is to be applied to (last year, buyer estimate of next year, or)
4. Because of its apparent simplicity, there is a significant danger of oversimplification!

2. Band of Investment

This method of calculating Rate may be done considering a physical or economic breakdown:

a. Physical (site and improvements)

example:

Return on investment in Site				.05
Return on investment in Improvements				.05
Return of investment in improvements (<i>recapture</i>)				
30-35 year life expected, round to 33; 1/33 = .03				<u>.03</u>
Capitalization Rate	Ro	=		0.13

Common in assessing: If real estate tax amount is not included in the calculation of net operating income, the effective tax rate is added to this capitalization rate for use in $V=I/R$.

Advantages: logical.

Disadvantages: may not simulate reality and buyer/investor thinking, significant problem of supporting remaining economic life in many (most?) cases.

b. Economic/financial (debt and equity); a weighted average of returns to debt and equity:

$$\frac{\text{Equity}}{.30} \times \frac{Re}{.08} = .024$$

$$\frac{\text{Debt}}{.70} \times \frac{Rm}{.10470} = \underline{.07334}$$

Blended, weighted Rate = .09734 rounded to .097 or 9.7%

Common in assessing: If real estate tax amount is not included in the calculation of net operating income, the effective tax rate is added to this capitalization rate for use in $V=I/R$.

Advantages: logical.

Disadvantages: may not simulate reality and buyer/investor thinking, significant problem of supporting equity capitalization rate, Re , in many (most?) cases, usually assumes max mortgage.

3. EGIM or EGRM Analysis (using Effective Income multiplier)

With the Effective Gross Income Multiplier estimated from the market, and with the subject Operating Expense Ratio estimated. Example:

EGIM, Effective Gross Income Multiplier = 6.0

Operating Expense Ratio (OER) = 0.40
(i.e. operating expenses are 40% of effective gross income.)

Net Income Ratio (NIR) = $1 - 0.40 = 0.60$

$R = \text{Net Income Ratio} / \text{Effective Gross Income Multiplier}$ or NIR / EGIM

$R = 0.60 / 6.0 = 0.10$

Common in assessing: If real estate tax amount is not included in the calculation of net operating income, the effective tax rate is added to this capitalization rate for use in $V=I/R$.

Advantages. Fairly simple

Disadvantages: Lacks detail, not always easy for taxpayers and clients to understand.
Using gross income and an inexact expense ratio may be sloppy.

4. DCR, Debt Coverage Ratio analysis.

- a. $DCR = NOI / Debt\ Service.$
- b. $Rate = (debt\ coverage\ ratio) * (loan\ to\ value\ ratio) * (annual\ mortgage\ constant)$

For example: $R = 1.25 * .70 * .10340 = .09013$ rounded to $0.090 = 9.0\%$

The debt coverage ratio (DCR) is a lender based requirement as one loan criteria. $DCR = NOI / DS.$ So lenders want a cushion with Net Operating Income exceeding debt service – the more the better. DCR varies somewhat from one lender to another, and varies with changing market and financial conditions, depending on funds availability, lender aggressiveness or reluctance to make commercial real estate loans, property type, and such.

Advantage: Simple. Easily available information requirement.

Disadvantage: ignores the equity investor and any specified market returns to the equity investor. The investor current or dividend returns exist to the extent the DCR is greater than 1.0. Oversimplifies!

5. Built-up Method. Safe rate + additions to rate to compensate for real estate's lack of liquidity, management, and risk .

The list of items varies by source and breakdown, but the idea is the same. Moreover, there are number of types of risk including risk of capital loss from negative value change, risk of income loss or negative income, risk of adverse change in government regulation or taxation, risk of purchasing power loss [inflation above increases in income and/or value], etc.

Example:	Component	Rate component estimate
	safe rate	= .010 (normally Gov' T-bills or bonds)
	Illiquidity of real estate	= .020
	Management, attention, and liability	= .035
	Risk (income, regulatory, market, app/dep, etc)	= <u>.030</u>
	Capitalization Rate:	= .095 or 9.5%

Advantages:

- Simple addition concept.
- The “safe rate” initial part is normally easy to support, but still may have a debatable range of 1%+.

Disadvantages:

- The components after the safe rate element are problematic – impossible at worst, nearly impossible at best, to support for an individual property application.
- Good in concept; not practical to implement and support.

6. Mortgage –Equity Analysis, aka Ellwood Analysis or Capitalization Model.

$$R=Y-MC\pm \text{app/dep} (1/S_n)$$

Yield capitalization considers income performance over time: the stream of income during the period of ownership plus the reversion. The reversion is a lump-sum benefit the investor receives upon sale of the property.

One problem of the ratio model $V=I/R$ is that there is provision for just one income. This is a problem when income is expected and forecast to change from year to year, and sometimes quite radically. This may be the situation in a number of different situations and types properties including phased development, recognizing timing for absorption or lease-up, down times for some rental units during times of repair or modernization, etc.

One way of overcoming this problem was developed by Mr. Pete Ellwood in the 1950s-1960s. He was a review appraiser for New York Life, and worked on various types of sensitivity analysis (If we make this loan at the appraised value, what happens if - - - -. For example, what happens to the equity cushion if income is X% less than expected or if property value change turns out to be Y% instead of the expected X%, etc. Sensitivity analysis gets into this “what happens if - - - -[if something happens to one or more component parts of the investment what is the impact on x, y, or z?]”

He, and others after him, recognized the reality of 1. buyers forecasting likely investment performance over time in the future, 2. limited holding periods, 3. mortgage financing, and 4. returns in the form of cash flows to the investor, 5. equity build-up, and 6. property value change over the holding period. In other words, what happened over time should be included in a valuation model. The return over time is called Yield. To accommodate, a formula for R (rate) was developed for use in the familiar ratio model $V=I/R$:

$R=Y-MC\pm \text{app/dep} (1/S_n)$; [note: “ $1/S_n$ ” is the sinking fund factor at Y rate, over the forecast period, and app and dep represent percent property value change, either –appreciation, or +depreciation]

The terms of the equation or model are:

Continued...

$$R=Y-MC\pm \text{ app/dep } (1/S_n);$$

Where:

Y = equity yield, a return recognizing capital outlay followed by investment performance over time. (when you see 'yield', think performance over time, not just a rate or relationship between income and value).

M = loan to value ratio

C = a constant to include equity build-up over the time period as the mortgage is paid; i.e. some principal on the mortgage is paid down by the periodic payments.

1/S_n = the sinking fund factor at Y rate over the forecast period.

App or Dep = appreciation or depreciation in property value forecast considering a purchase price at the calculated value and a reversion based on a sales price at the end of the holding period.

Note: For an income stream with a constant rate of specified periodic change, a J factor was later added to account for the change in income during the forecast period.

In addition to solving for R, rate, to then go on to solve for Value using $V=I/R$, analysts could also solve for Yield, given capital outlay and investment performance, i.e. income and equity build-up, and property value change.

By the 1970s, financial calculators were widespread, the by the late 1970s and early 1980s office programmable calculators, mini-computers, and personal computers moved in with spreadsheet programs, making life much easier. With programmable calculators, and, soon following, low cost easy-to-use spreadsheets widespread the income and investment performance could be quantified, entered as forecast, investor's desired or market yield rate specified and entered, and the present worth of the forecast money performance of the investment easily handled.

Today the yield model does not need to adjust 'R', rate, for use in the static ratio model $V+I/R$. This is normally done, with variable income in whatever amounts or patterns, positive and negative, by a discounted cash flow (DCF) capitalization process.

Continued...

Advantages.

Considers the realities time, yield, holding period, mortgage financing and property value change explicitly rather than simply implicitly.

Disadvantages

Complicated to explain to non-appraisers; equity yield difficult to derive from the market with consistency, reliability, and validity; income still a problem with variable/multiple incomes year to year; and requires forecasting value X years hence (when the value now is not known!)

Note: the goals of this technique are much better accomplished in the Discounted Cash Flow capitalization techniques under Yield Capitalization later in these materials. Thus, this method of deriving "R" is not used as part of Direct Capitalization.

The basic methods of estimating appropriate Rate for use in the Direct Capitalization model $V = I / R$, have been shown in the foregoing pages. These rate calculation methods are basically for this overall model, aka $V_0 = I_0 / R_0$

Direct Capitalization, or ratio model, Uses

$$V = I / R$$

can be used for any investment position by using the income to the particular position and the rate for that position or component.

Investment positions or investment components may be

physical : Site (or “Land”) , and Building (or “Improvements”)

or

economic: Equity and Debt (or “mortgage”)

The **value of any investment position in income property** can be estimated in this way; i.e. using income approach techniques:

- Value overall: $V_o = I_o / R_o$
- Value Land $V_L = I_L / R_L$
- Value Building $V_B = I_B / R_B$
- Value Mortgage $V_M = I_M / R_M$
- Value Equity $V_e = I_e / R_e$

Normally we’re interest in the value of the overall property, simply:

$$V = I / R$$

(this is the focus of the discussion here)

*Note: In these pages, as in most practice and conversation, the words **“site” and “land”** are used interchangeably, as are the words **“building” and “improvements”** and **“economic” and “financial”** even though there are, of course, differences. Further, the words **“investment position” and “component”** are also used interchangeably.)*

The following page shows a reconstructed operating statement for use in later examples.

For the following examples: INCOME

Potential Gross Income (PGI)		\$70,000
-V&C: Vacancy and Collection <u>Allowance</u>	5.0%	<u>3,500</u>
Effective Rental Income		66,500
Plus Reimbursements* (if lease requires CAM reimb. By tenants to owner)		<u>1,800*</u>
=Effective Gross Income		69,300
+Other Income (stg, parking, vending)		<u>5,800</u>
=Effective Gross Income after other income (EGI)		74,100
-Less Owner's Operating Expenses (examples)		
Real Estate Tax*	3,000	
Insurance	900	
Maintenance and Repairs	1,500	
<i>Common Area Maintenance (CAM)*</i>	<i>2,000*</i>	
Utilities	5,000	
Promotion, Advertising	500	
Management	10% EGI	7,230
Legal and Accounting	1,200	
Other, Trash Collection, pest control, etc.	<u>800</u>	
Total Operating Expenses		22,130
Reserves for Replacements (short life items; examples)		
Roofing	\$ 50,000 /10yr	\$5,000
Painting	60,000/ 10	6,000
HVAC	24,000/ 8	3,000
Plumbing	15,000 / 15	1,000
Carpeting	12,000 / 6	2,000
Appliances	16,000 / 8	<u>2,000</u>
Total Reserves		19,000
=Total Operating Expenses & Reserves		<u>41,130</u>
Net Operating Income	NOI or I or Io	<u>32,970</u>

V&C may be actual if available, but should look forward (buyer thinking)

Reimbursements from tenants, if any, depending on terms of leases.

For assessing, taxes unknown, so use zero; then add effective tax rate to the capitalization rate to calculate value.

Paid by owner, but all or part reimbursed from tenant. Sometimes not all reimbursed because of vacancy or all tenants not under the same lease provisions.

Comment re valuation without reserves for replacement: include if buyers in the market do in their forecasts of income when purchasing an income property. Often depends on type and size. Required by lenders.

Net Operating Income is BEFORE debt service (principal and interest) on loans. To value the property as fee simple without mortgage or contract loan.

Application of Direct Capitalization:

First, derive the income to be used (see the reconstructed operating statement on the preceding page). Normal sources: subject actual recent and current income, and comparable market rental/ lease information.

Second, derive the overall rate to be used. Normally the best source is the market, i.e. comparable property sales producing income at the time of sale (must have similar building ratio, expense ratio, remaining economic life, risk, property type, age/condition, buyer/investor desirability, etc.)

Third, apply in the V+I/R model.

Example:

1. Assume a subject reconstructed operating statement as shown on page 18.
2. Derive an appropriate overall Rate from the market:

Derivation of Overall Rate (R or Ro) from market information.*

Prop	Sales Price	Sale Date	Net Op. Income	Ro [Overall Rate]
A	\$250,000	3 mo ago	\$28,500	.1143 or 11.40%
B	\$200,000	8 mo ago	\$21,000	.1050 or 10.50%
C	\$325,000	4 mo ago	\$36,400	.1120 or 11.20%

Analyst concludes appropriate rate is 0.110, or 11.0%

3. Calculate value indication amount by Direct Capitalization by applying the Rate to the estimated subject net operating income:

Value = Income/Rate: Net Operating Income \$32,970 divided by Overall Rate 11.0% =

$32,970 / .11 = \$299,727$ rounded to $\$300,000$.

* NOTE 1: comparable properties should have the same land to building ratio, expense ratio and remaining economic life; if these items are significantly different in the comparables as compared to the subject, mismatch can result and the extracted rate undependable or misleading.

* NOTE 2: Comparable and competitive listings may also be included to indicate upper limits of price and lower limits of rates to help bracket the conclusion for the subject.

**Consider the same basic example, but an Ad Valorem Valuation Using Effective Tax Rate
(numbers from above example, income information page 18)**

The real estate tax amount is not known (because we are estimating value which is necessary to calculate the real estate tax amount) but the effective tax rate can be found and is known.

ETR: Assume an effective tax rate of .01510.* Income: Real estate tax in the foregoing calculation of net operating income was \$3,000, so the net operating income without including real estate tax in the expenses would be \$35,970.

The comparable sales from which rate is derived, is re-calculated with adjusted net operating without real estate tax expense. The overall rates thus calculated are:

Derivation of Overall Rate (R or Ro) from market information, as before				
<u>Property</u>	<u>Sales Price</u>	<u>Date</u>	<u>NOI Net Income</u> <u>w/o RE Tax</u>	<u>Ro</u>
A	\$250,000	3 mo ago	\$28,500	.1260 or 12.60%
B	\$200,000	8 mo ago	\$21,000	.1175 or 11.75%
C	\$325,000	4 mo ago	\$36,400	.1120 or 11.20%

Analyst conclusion of appropriate overall rate is 0.110 or 11.02 %, PLUS the ETR of 0.01510 = the loaded capitalization rate: 12.51% (0.1251)

So the value for taxation would be

$$V=I/R ; V = 35,970 / .1251 = \$287,535 \text{ rounded to } \$287,000.$$

Note: The value calculation for ad valorem taxes in this case (\$287,000) is not the same as the value calculation using the actual existing taxes (\$300,000) because the *actual* taxes happen to have an *effective* tax rate (\$3,000 / 300,000=1.0%) less than the *market indicated* effective tax rate (1.151%).

* This tax rate could come from either:

1. assessment ratio x tax rate; or 2. actual tax / full cash value; or 3 actual tax / market sales price

See separate material on Effective Tax Rate

CAPITALIZATION -- Residual Techniques.

Here are the basic steps in the **residual capitalization processes**. All use $V=I/R$ as previously discussed, but applying it to the income attributable to, or residual to, a particular investment position to find the value of the position.

Previously we looked at the value of the property overall, so we were looking at overall rate and overall income without breaking either down below the total property level.

$$V_o = I_o / R_o \quad \text{and} \quad I_o = V_o * R_o \quad \text{and} \quad R_o = I_o / V_o$$

The subscript "o" represents "overall". When not shown, it is assumed because we are normally dealing with the overall property, land and building, equity and debt (if any); i.e. the total property value, income and rate without breakdown into investment positions.

But there are investment positions or components categorized as either

[1] **physical** investment positions (land and buildings, and

[2] **economic (or financial)** investment positions (mortgage and equity).

Investment positions may be physical: **land and buildings:**

$$\text{Land:} \quad V_L = I_L / R_L \quad \text{and} \quad I_L = R_L * V_L \quad \text{and} \quad R_L = I_L / V_L$$

$$\text{Building:} \quad V_B = I_B / R_B^1 \quad \text{and} \quad I_B = R_B * V_B \quad \text{and} \quad R_B = I_B / V_B$$

¹ Translation: Value of building V_B = income to the building I_B divided by the building capitalization rate R_B .

Investment positions may be economic: **mortgage debt and equity.**

$$\text{Mortgage position} \quad V_m = I_m / R_m \quad \text{and} \quad I_m = R_m * V_m \quad \text{and} \quad R_m = I_m / V_m$$

$$\text{Equity Position} \quad V_e = I_e / R_e \quad \text{and} \quad I_e = R_e * V_e \quad \text{and} \quad R_e = I_e / V_e$$

So.....

For value of any of these investment positions or components, divide the income to the position by the rate to that position.

To find the income needed to satisfy any of these investment positions, multiply the Rate times the Value of the position.

From a market transaction it may be possible to find the appropriate rate for an investment position; the rate for the position or component.

How is this related to “residual”?

1. It is possible to deduct from the income, that portion attributable to, or required by, investment position A if it has a known or previously found value, leaving residual or left over income to investment position B.
2. The income to investment position B may then be capitalized to arrive at a value for investment B if the appropriate Rate is used.
3. The value of investment position B thus calculated may be added to the previously found/known value of investment

The Straight Line Building Residual Method

Referenced for Shopping Centers (cited in ARS 42-13203).

Definition:

The **Building Residual Technique** is “a capitalization technique in which the net operating income attributable to improvements is isolated and capitalized by the building capitalization Rate (R_B) to indicate the improvements’ contribution to the total property value. When the improvements’ value is added to land value, a total property value opinion is produced”.

(TARE, 13th Ed., Appraisal Institute, Page 511)

Known:

- Net Operating Income for the property - by separate estimate
- Land or Site Value - by separate estimate
- Land Capitalization Rate (R_L) - estimated from the market
- Building Capitalization Rate. This, R_B , consists of return ON and return OF (recapture) the investment in the building. These components of R_B are estimated from market information.

Underlying model, idea, technique, relationship used: $V = I / R$.

In this case, $V_B = I_B / R_B$ to find the building contribution; when estimated land value is added, the result is the total property value.

1. With land value known, the amount of income return to the land is land value times R_L or rate of return on, or to, the land.
2. The remaining, or residual, income is attributable to the building improvements.
3. This residual income to the improvements is capitalized by the building capitalization rate, R_B to find the building value or contribution.
4. The building value thus calculated is added to the land value estimated from market data to arrive at total property value.

BUILDING RESIDUAL EXAMPLE

Known: Land Value previously estimated by sales comparison

Unknown: Building (i.e. total improvements) Value

Goal: Find income residual to the building improvements after income necessary to attribute to land value. Then add value of building thus found to the value of the land.

Net Operating Income (NOI or I_o) (to property overall) \$100,000 (after r.e. tax)

Less Income Attributable to the Land (I_L):

Land Value x R_L : \$200,000 x .04

8,000

Income Residual to the Building (I_B)

\$ 92,000

Income attributable to, or required by, the investment in land with a 4% return requirement

Building Value Calculated:

Building Capitalization Rate (R_B):

1. Return on investment .040

2. Return of investment (recapture) .025

(1/Estimated remaining economic life; 1/40 years = .025)*

Total Building Capitalization Rate (R_B) .065

Estimated Building Value, $V_B = I_B / R_B$, so

\$92,000 / .065 = \$1,415,384

Add Land Value \$ 200,000

Total Property \$1,615,384 Rounded to \$ _____.

* See next page for table

* The recapture is straight-line; i.e. the same percentage each year. The percentage is the reciprocal of the forecast remaining economic life of the improvements.

Remaining Economic Life Estimate	To recapture or recover per year. (Return of investment)	Recapture Percentage per year
5	1/5	0.20 or 20%
10	1/10	0.10 or 10%
20	1/20	0.05 or 5%
30	1/30	0.033 or 3.3%
33	1/33	0.030 or 3.0%
35	1/35	0.02857 or 2.857%
40	1/40	0.0250 or 2.5 %
45	1/45	0.0222 or 2.22%
50	1/50	0.020 or 2.0%
60	1/60	0.01666 or 1.667%
75	1/75	0.01333 or 1.333%
100	1/100	0.01 or 1%

For Ad Valorem Taxation Valuation,with **property tax not included** in the expenses (thus a **higher NOI**)**BUILDING RESIDUAL EXAMPLE for AD VALOREM TAXES, FULL CASH VALUE.****Assume**

- an Effective Tax Rate (ETR) of 0.025 (i.e. 2.5%).**
- Property tax amount last year was \$30,000.**

Net Operating Income (NOI or I_o) (to property overall) \$ 130,000
(Without income tax expense)

Less Income Attributable to the Land (I_L):

Land Value x R_L : \$200,000 x .04+.025=.065 13,000

Income Residual to the Building (I_B) \$ 117,000

Building Value Calculated:

Building Capitalization Rate (R_B):

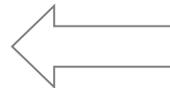
1. Return on investment .040

2. Return of investment (recapture) .025

($1 / \text{Estimated remaining economic life}; 1/40 \text{ years} = .025$)

3. Plus Effective Tax Rate (ETR) .025

Total Building Capitalization Rate (R_B) .090



Estimated Building Value, $V_B = I_B / R_B$, so

\$117,000 / .090 = \$1,300,000

Add Land Value \$ 200,000

Total Property **\$1,500,000** **Rounded to \$ _____.**

An Arizona Statute Providing for a Specific Capitalization Method:

42-13203. Replacement cost less depreciation method of valuing shopping centers; election to use income method on appeal

A. Except as provided by section 42-13204, the county assessor shall determine the valuation of a shopping center by using the replacement cost less depreciation method.

B. This method shall use base rates in existence on January 1, 1982 subject to any changes that are necessary to reflect changes in costs of construction. The base rates shall be based on average costs that relate to this state as reported in professional cost manuals and publications that are approved by the department.

C. The depreciation schedule used under the replacement cost less depreciation method, including any adjustment for obsolescence, shall be the schedule in existence on January 1, 1982 and used by the county assessor.

D. On review or appeal of a valuation determined under this section, the owner of a **shopping center may elect to have the valuation of the shopping center determined by the income method commonly known as the straight line building residual method if the owner submits all reasonably necessary income and expense information.** The reviewing body shall use the information submitted by the owner and may also use any other information customarily analyzed under this method. **The capitalization rate used for purposes of this subsection shall be comprised of:**

1. For the 1983 tax year a discount rate of 10.5 per cent, adjusted each year thereafter according to the percentage change in the weighted average cost of monies derived from interest paid on savings accounts, federal home

Continued....

loan bank advances and other borrowed money as reported by the federal home loan bank of San Francisco for this state for the most recent twelve month period ending June 30. The discount rate shall not be less than ten per cent.

2. A recapture rate based on a thirty-five year economic life.
3. The effective tax rate for the property for the most recent tax year.

E. The department shall:

1. Determine the average differences in valuations for similar size and age shopping centers that result from the two valuation methods prescribed by this section and section 42-13204 and from which the department shall develop a schedule of obsolescence factors that can be added to the depreciation schedule used in the replacement cost less depreciation method. County assessors shall incorporate the obsolescence factors into the depreciation schedule.

2. Develop obsolescence factors prescribed by paragraph 1 of this subsection based on statistical research in order to, on average, equalize the valuations that result from the two valuation methods prescribed in this section and section 42-13204. The department may use data from state sources, nationally recognized publications and journals and other related research.

42-13204. Election to use income method of valuation initially

In lieu of valuation under section 42-13203, the owner of a shopping center may elect to have the valuation of the shopping center determined by the income method commonly known as the straight line building residual method if the owner submits all reasonably necessary income and expense information for the owner's three most recent fiscal years to the county assessor before September 1 of the year immediately preceding the year for which the property will be valued.

42-13205. Valuation method applied on appeal

On appeal of a valuation determined by the income method pursuant to section 42-13204 or an appeal in which the owner has elected the income method pursuant to section 42-13203, subsection D, the valuation of a shopping center shall be determined by whichever one of the following valuation methods most closely approximates fair market value:

1. The income method commonly known as the straight line building residual method pursuant to section 42-13203, subsection D. If the reviewing body finds that other information that is customarily analyzed

under the income method must be used to properly apply the income method to the property, it may use the other information to supplement information provided by the owner if:

(a) The credible and accurate information provided by the owner remains the primary basis for the valuation under the income method.

(b) The supplementary information is credible, is derived from properties or circumstances that are substantially comparable to the property and is valid under the income method.

(c) The reviewing body specifies in its written order what other information was considered, the manner in which it was applied and the change in the valuation under the income method, if any, resulting from the use of the supplementary information.

2. The replacement cost less depreciation method pursuant to section 42-13203.

3. The market comparison method, if a sale of the subject property occurred within two years before the date of valuation and no material change to the property, its lease terms, tenants or occupancy rates or any other material fact has occurred since the sale. If the market comparison method is applicable, the reviewing body may consider information on sales of other properties that occurred within two years before the date of valuation and that are determined to be comparable to the subject property by clear and convincing evidence.

42-13206. Valuation of dedicated parking or common areas

For the purposes of this article any part of the land of a shopping center that is limited by a zoning requirement or contractual covenant to parking or common area use shall be valued on the assumption that no other use is possible.

EQUITY RESIDUAL EXAMPLE - using equity residual to derive equity dividend rate from the market.

(ref. TARE, p. 513)

Known: Debt amount; i.e. mortgage, therefore also know the mortgage capitalization rate, (aka mortgage constant, R_M or R_M) component and amount of equity

Unknown: Equity Capitalization Rate. R_E aka R_E

Goal: Find income residual to the equity component or position after income necessary to satisfy the mortgage component. Find the return to equity, aka equity capitalization rate or equity dividend.

Net Operating Income	\$ 60,000
Less Mortgage Debt Service; Mortgage known @ \$375,000	
\$375,000 loan, 7% interest, 25-year term	
\$375,000 x R_M .085811* =	<u>32,179</u>
Residual Income to Equity	\$ 28,196
Equity Investment (known)	\$ 212,000
Equity capitalization (aka equity dividend rate R_E)	$\$ 28,196 / \$212,000 = 13.3\%$

The Straight Line Building Residual Method

Referenced for Shopping Centers (cited in ARS 42-13203).

Definition:

The **Building Residual Technique** is “a capitalization technique in which the net operating income attributable to improvements is isolated and capitalized by the building capitalization Rate (R_B) to indicate the improvements’ contribution to the total property value. When the improvements’ value is added to land value, a total property value opinion is produced”.

(TARE, 13th Ed., Appraisal Institute, Page 511)

Known:

- Net Operating Income for the property - by separate estimate
- Land or Site Value - by separate estimate
- Land Capitalization Rate (R_L) - estimated from the market
- Building Capitalization Rate. This, R_B , consists of return ON and return OF (recapture) the investment in the building. These components of R_B are estimated from market information.

Underlying model, idea, technique, relationship used: $V = I / R$.

In this case, $V_B = I_B / R_B$ to find the building contribution; when estimated land value is added, the result is the total property value.

5. With land value known, the amount of income return to the land is land value times R_L or rate of return on, or to, the land.
6. The remaining, or residual, income is attributable to the building improvements.
7. This residual income to the improvements is capitalized by the building capitalization rate, R_B to find the building value or contribution.
8. The building value thus calculated is added to the land value estimated from market data to arrive at total property value.

For Ad Valorem Taxation Valuation,with **property tax not included** in the expenses (thus a **higher** NOI)**BUILDING RESIDUAL EXAMPLE for AD VALOREM TAXES, FULL CASH VALUE.****Assume**

- an Effective Tax Rate (ETR) of 0.025 (i.e. 2.5%).
- Property tax amount last year was \$30,000.

Net Operating Income (NOI or I_o) (to property overall) (Without income tax expense)	\$ 130,000
Less Income Attributable to the Land (I_L):	
Land Value x R_L : \$200,000 x .04+.025=.065	<u>13,000</u>
Income Residual to the Building (I_B)	\$ 117,000

Building Value Calculated:Building Capitalization Rate (R_B):

4. Return on investment	.040
5. Return of investment (recapture) (1 / Estimated remaining economic life; 1/40 years = .025)	.025
6. Plus Effective Tax Rate (ETR)	<u>.025</u>
Total Building Capitalization Rate (R_B)	.090

Using the rate:

Estimated Building Value, $V_B = I_B / R_B$, so

$$\$117,000 / .090 = \$1,300,000$$

$$\text{Add Land Value} \quad \underline{\$ 200,000}$$

$$\text{Total Property} \quad \underline{\$1,500,000 \text{ Rounded to } \$ \underline{\hspace{2cm}}}$$

YIELD CAPITALIZATION

Using Discounted Cash Flows

An Overview

The Yield Capitalization Model.

Yield capitalization considers income performance over time: the stream of income during the period of ownership plus the reversion. The reversion is a lump-sum benefit the investor receives upon sale of the property.

One problem of the ratio model $V=I/R$ is that there is provision for just one income. This is a problem when income is expected and forecast to change from year to year, and sometimes quite radically. This may be the situation in a number of different situations and types properties including phased development, recognizing timing for absorption or lease-up, down times for some rental units during times of repair or modernization, etc.

Reference the Direct Capitalization, methods for deriving Rate earlier in the previous “Direct Capitalization” Section.

One way of overcoming this problem was developed by Mr. Pete Ellwood in the 1950s-1960s. He was a review appraiser for New York Life, and worked on various types of sensitivity analysis (If we make this loan at the appraised value, what happens if - - - -. For example, what happens to the equity cushion if income is X% less than expected or if property value change turns out to be Y% instead of the expected X%, etc. Sensitivity analysis gets into this “what happens if - - - [if something happens to one or more component parts of the investment what is the impact on x, y, or z?)

He, and others after him, recognized the reality of 1. buyers forecasting likely investment performance over time in the future, 2. limited holding periods, 3. mortgage financing, and 4. returns in the form of cash flows to the investor, 5. equity build-up, and 6. property value change over the holding period. In other words, what happened over time should be included in a valuation model. The return over time is called Yield. To accommodate, a formula for R (rate) was developed for use in the familiar ratio model $V=I/R$:

$R=Y-MC\pm \text{app/dep} (1/S_n)$; [note: “ $1/S_n$ ” is the sinking fund factor at Y rate, over the forecast period, and app and dep represent percent property value change, either – appreciation, or +depreciation]

Y = equity yield, a return recognizing capital outlay followed by investment performance over time. (when you see ‘yield’, think performance over time, not just a rate or relationship between income and value).

M = loan to value ratio

C = a constant to include equity build-up over the time period as the mortgage is paid; i.e. some principal on the mortgage is paid down by the periodic payments.

For an income stream with a constant rate of specified periodic change, a J factor was later added to account for the change in income during the forecast period.

In addition to solving for R, rate, to then go on to solve for Value using $V=I/R$, analysts could also solve for Yield, given capital outlay and investment performance, i.e. income and equity build-up, and property value change.

By the 1970s, financial calculators were widespread, then by the late 1970s and early 1980s office programmable calculators, mini-computers, and personal computers moved in with spreadsheet programs, making life much easier. With programmable calculators, and, soon following, low cost easy-to-use spreadsheets widespread the income and investment performance could be quantified, entered as forecast, investor's desired or market yield rate specified and entered, and the present worth of the forecast money performance of the investment easily handled.

Today the yield model does not need to adjust 'R', rate, for use in the static ratio model $V+I/R$. Handling variable or irregular multiple income and expenses is normally done by specifying the individual amounts in a spreadsheet in whatever amounts or patterns, positive and negative, by a **discounted cash flow (DCF) capitalization process**. See exhibits enclosed.

In the DCF the valuer forecasts the year-by-year annual income amounts during the period of anticipated ownership and the reversion at the end of the ownership period anticipated. The present worth of the annual income benefits and the reversion as an additional income in the last year of ownership is the indicated capitalized value.

In a simple form:

Discounted Cash Flows

Year	0	1	2	3	4	5
Income		\$3,000	\$5,000	\$1,000	\$5,500	\$6,000
Reversion net to owner						\$50,000
Total Income		\$3,000	\$5,000	\$1,000	\$5,500	\$56,000
PW @	12%	yield rate				
Indicated Value	\$38,082.66					

PW= Present worth of the income stream, with the reversion received by the investor at the end of the holding period being added to the last year's annual income.

This is the basic framework as shown above.

The Yield Capitalization Model Requirements

1. Requires considerable forecasting
 1. Annual *net* income amounts after considering estimated potential gross rental income and other income as well as vacancy and collection losses.
 2. Operating Expenses and the likely annual amounts AND change for each expense item.
 3. Year of replacement of short life items.
 4. Value and sales costs forecast for the reversion
(*price, commission, and if reversion to equity considered, mortgage payoff*)

Hence estimates must be made for these items for each year of the DCF: *gross rental income, other income, vacancy and credit allowance, and each operating expense in addition to future likely sales price and selling expenses.*)

2. Requires the estimation of a Yield Discount Rate
 5. To derive this rate from sales data a lot of information is needed: purchase price, annual income and expenses or net income during the ownership period, reversion net to investor after all expenses. And that shows what the yield rate WAS, not what buyers expect now.
 6. Interviews with investors and potential buyers
 7. Analysis of alternative investments, real estate and otherwise, with similar investment characteristics, capital requirements, timing, and risk.
3. Requires a number of assumptions including holding or forecast period.

DCF in a Nutshell.

DCF may be a good technique when highly variable income streams are expected, however there remains the problems of

- **forecasting and assumptions**, as well as
- **deriving a supportable yield rate.**

The number and extent of difficult-to-support required items, especially in the face of weak or dynamic markets, with highly proprietary information required from the market and its comparables definitely weakens the approach and limits “explainability “and acceptability by the public.

notes