PT 103

Valuation of Real Estate

Maine Property Tax Division

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MAINE PROPERTY TAX DIVISION

Chapter 1
The Basics

The purpose of this text is to introduce the three approaches to valuation of property for tax assessment purposes, the market approach, the income approach, and the cost approach. All three approaches lead to estimates of market value (also referred to as “current market value”) for property within a municipality.

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The Maine Constitution requires a “general valuation” at least once every ten years. This requirement does not mean a municipality must contract with a valuation company to do a complete municipal revaluation, but an occasional revaluation can be a valuable tool for maintaining just value throughout a municipality.

Highest and best use is the legally allowable use that will generate the highest return to the property over time.

1. Physically possible and probable

2. Legally permissible

3. Financially feasible

4. Most productive (either income generated for a business or available amenities for an individual)

The goal of any valuation procedure is to establish just value.

Just value = market value.

The definition of market value as adopted by the Appraisal Institute and the International Association of Assessing Officers (IAAO) is as follows:

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

A. Buyer and seller are typically motivated;

B. Both parties are well informed or well advised and acting in what they consider their best interests;

C. A reasonable time is allowed for exposure to the open market

D. Payment is made in terms of cash in U.S. dollars;

E. And the price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale

The Four Great Forces

P.E.G.S

1. Physical forces
2. Economic forces
3. Governmental forces
4. Social forces

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Economic Principles of Valuation

- The principle of **anticipation** says that market value is the present worth of all anticipated future benefits derived from the property.
- The principle of **balance** says that market value is maximized when the four agents of production (land, labor, capital, and management) attain a state of equilibrium
- The principle of **change** says that the market is never constant
- The principle of **competition** says that competition is created when the potential for profit, or the existence of new amenities attracts new sellers and buyers to a market.
- The principle of **conformity** says that the more a property is in harmony with its surroundings, the greater the contributory value.
- The principle of **consistent use** says that property must be valued with a single use for the entire property.

Chapter 2
Land Valuation

Developed Lots

A lot, to be classified as developed, must have significant improvements. The fact that a lot has a building on it does not, by itself, make the lot developed.

It is possible to have a developed lot without water or septic, but that is a rare situation involving extensive improvements to the land otherwise.

The State of Maine requires assessors to determine and report land values separately from the value of improvements (buildings and other items affixed to land).

Establishing a land pricing schedule helps establish equitable land values throughout the jurisdiction

Front Foot Valuation

This method establishes the value of one foot of frontage – usually on a road or a body of water – with a parcel depth equal to a standard size lot for the area.

The value of a parcel is equal to the front foot value (FFV) multiplied by the depth factor (DF) multiplied by the number of feet of frontage (FF) for the property

$$\text{Value} = \text{FFV} \times \text{DF} \times \text{FF}$$

The calculation of depth factors is usually not a straight correlation. The depth factor calculation used in this text is equal to the square root of the subject lot depth divided by the standard lot depth, or:

$$\text{Depth Factor} = \sqrt{(\text{parcel depth}/\text{standard depth})}$$

Where “parcel depth” is the depth of the subject lot and “standard depth” is the depth of a standard lot. For example, the depth factor calculation for a lot that is 125 feet deep in a neighborhood where the standard lot depth is 100 feet is:

$$DF = \sqrt{(125/100)} = \sqrt{1.25} = 1.12$$

Valuation of Rectangular Parcels

To calculate the value of a rectangular parcel, follow the three front foot value method steps and round the answer to the nearest $100.

Main St

Example. Standard depth = 220ft; FFV = $350/ft

1) DF = √(parcel depth/standard depth)
= √(275ft/220ft) = √1.22 = 1.12

2) Parcel Value = FFV x DF x FF = $350/ft x 1.12 x 110ft = $43,120, rounded to $43,100

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Valuation of Rear Rectangular Parcels

To calculate the value of a rear parcel, multiply the front foot value by the difference between the depth factors of the farthest and nearest distances of the parcel from the street, then multiply the resulting adjusted front foot value by the number of front feet in the parcel.

Standard Depth = 200′ Front Foot Value = $300

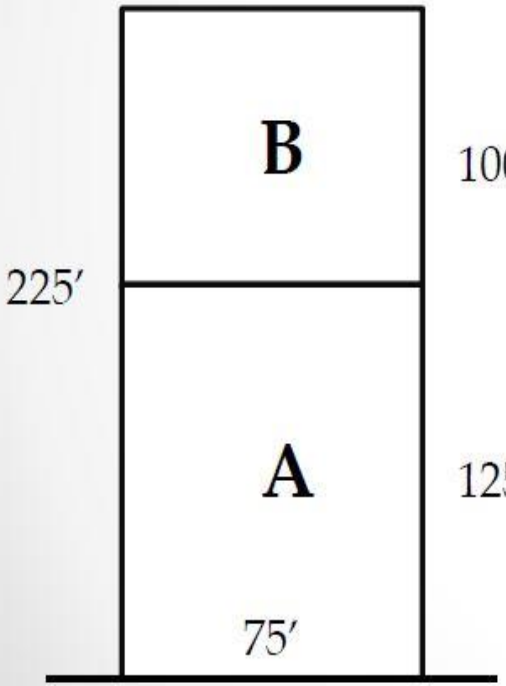


Figure out depth factor of Lot A & Lot A & B Combined:

Lot A = 125 ÷ 200 = .625 (√) .79 Depth Factor

Lot A & B = 225′ ÷ 200 = 1.125 (√) 1.06 Depth Factor

Difference of Depth Factors:

1.06 - .79 = .27

Value Lot B:

Fr. Ft. X Fr. Ft. Value X Depth Factor = Lot Value

75′ X $300 X .27 = $6,075 or $6,100 rounded

Valuation of Triangular Parcels

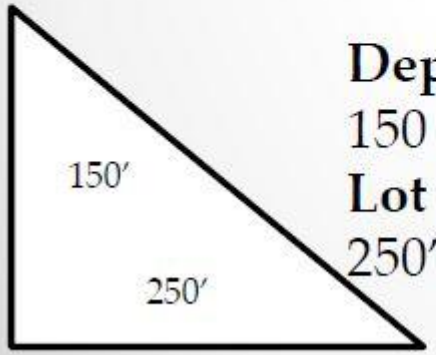
The process of valuing Triangular Parcels is the same process as Rectangular Parcels with an additional step required. The application of the "Triangular Factor". This factor presumes that there is a loss of value inherent in triangular shaped parcels as compared with rectangular shaped parcels.

To calculate the value of a Triangular Lot with its' base on the street is a **"Delta Triangle".** First compute the value as a rectangular lot of identical frontage and depth. Than take **60%** of the resulting figure as the value attributable to the lot due to it shape.

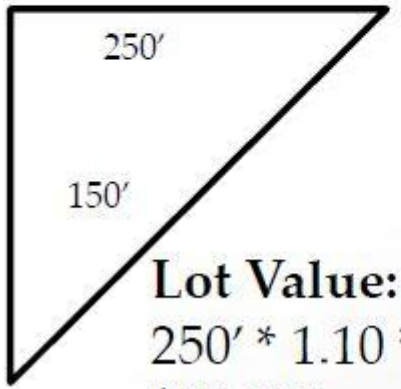
For a Triangular Lot whose Apex on the street is a **"Nable Triangle"** take **30%** of resulting figure as the value attributable to the lot due to its shape.

Fr. Ft. X Fr. Ft. Value X Depth Factor X Triangle Factor = Lot Value

Standard Depth = 125' Fr Ft. Value = $350



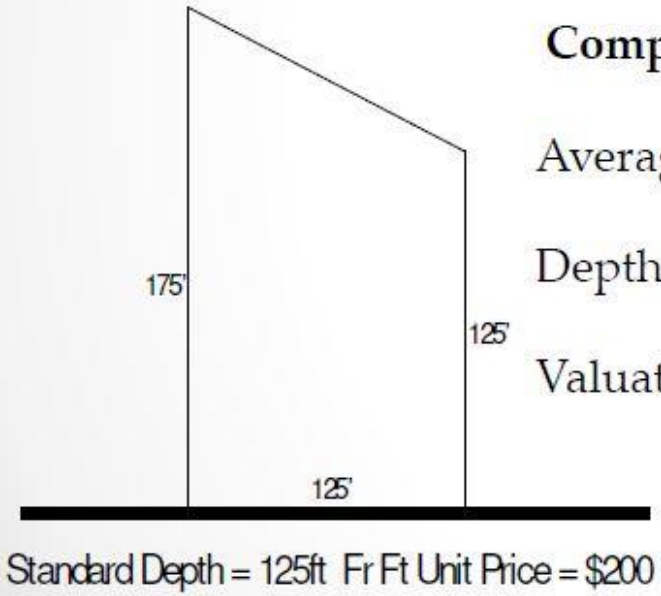
Depth Factor:
150 ÷ 125 = 1.2 (√) **1.10**
Lot Value:
250' * 1.10 * $350 * .60 = $57,750



Lot Value:
250' * 1.10 * $350 * .30 = $28,875 or $28,900

Valuation of Trapezoidal Shaped Parcels

To calculate the value of a trapezoidal shaped parcels at right angles to the street. Multiply the Front Foot Value by the Depth Factor for the average depth of the parallel sides of the parcel. Multiply the resulting adjusted Front Foot Value by the Frontage of the parcel.



Compute the Average Depth, Depth Factor and Value of the Parcel

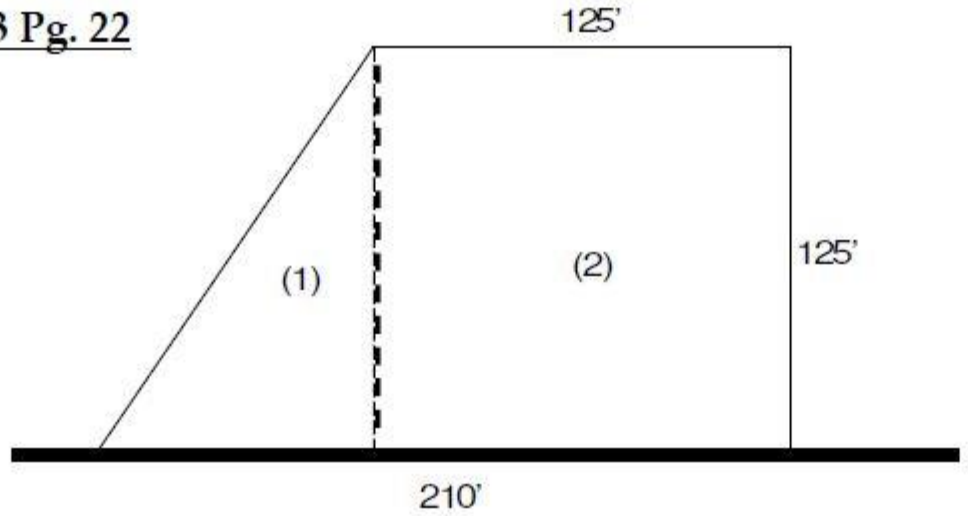
Average Depth: 175′ + 125′ = 300′ ÷ 2 = 150′

Depth Factor: 150′ ÷ 125 = 1.20 √1.10

Valuation of Lot: 125′ x ($200 x 1.10) = $27,500

The valuation of a trapezoidal parcel at an oblique angle to the street requires two separate parcel valuations, one for the rectangular portion and the other for the triangular portion. The total parcel value is the sum of these two separate calculations.

Example Basic Course 3 Pg. 22



Standard Depth = 125ft Fr Ft Unit Price = $200

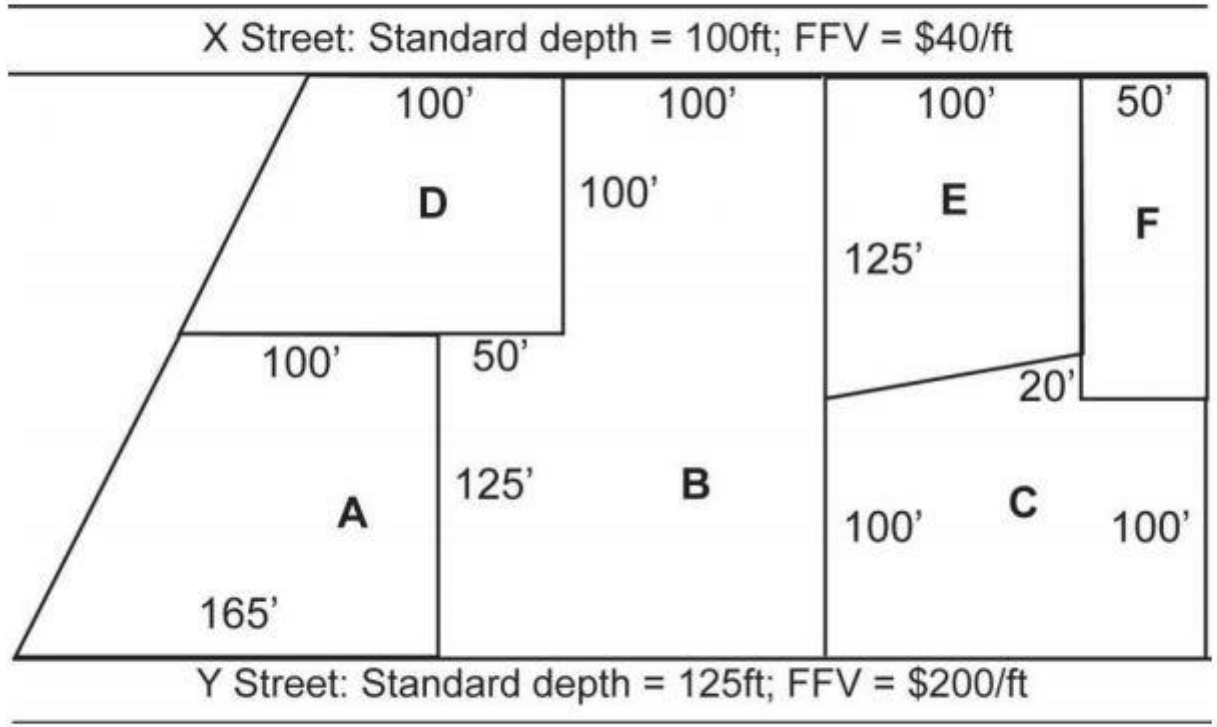
Triangle Front Feet = 210′ – 125′ = **85′** **Depth Factor =** 125 ÷ 125 = 1 √**1.00**

1) 85′ x ($200 x 1.00 x .60) = $10,200
2) 125′ x ($200 x 1.00) = $25,000

Total Parcel Value = $35,200

Value the Parcels Below, Using the Previous Methods

Problem 2.12.



Common Land Classifications

Urban – developed & undeveloped
- residential
- commercial
- industrial

Rural - developed & undeveloped
- residential
- commercial
- industrial
- agricultural
    a. unclassified
    b. classified
        1) Tree Growth
        2) Farmland
        3) Open Space
        4) Working Waterfront

Chapter 3
Measuring and Listing

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An interior inspection should start in the basement.

The following items affecting both grade and condition can be determined:

- Quality of stairs
- Foundation and basement material
- Basement ceiling height
- Finished basement area
- Water and other condition problems
- Type of heating system
- Quality of the flooring and wall framing (if exposed)
- Plumbing/piping quality
- Electrical rating and age
- Settling and framing issues

Ten Components of Structure

When valuing a building, assessors use ten basic components to determine grade.
The components are:

1. Foundation
2. Basement
3. Framing
4. Roof
5. Interior
6. Exterior
7. Floors
8. Heating
9. Plumbing
10. Electrical

There are five grades applicable to buildings.

These can be listed A-E

Or 5-1

A or 5 being the highest = Architecturally designed, contractor built. Using best materials.

E or 1 being the lowest = Basic shelter, but inadequate for residential living. Crude workmanship

Class Problem

Using Grading Schedule on page 47

The following is a sample grading calculation for a 1-story wood frame dwelling measuring 1,120 sq ft

1. Foundation

8’ excavation	grade: 4	**Grade** 3.6
8x18 footing	grade: 3	
8” poured concrete walls	grade: 3	
drainage outside only	grade: 3	
good site work	grade: 5	
Average grade =	(4 + 3 + 3 + 3 + 5)/5 = 3.6	

Repeat for each of the 10 items

Foundation:	Grade: 3.6
Basement:	Grade: 3.3
Framing:	Grade: 3.6
Roof:	Grade: 3.3
Interior:	Grade: 3.8
Exterior:	Grade: 3.6
Floors:	Grade: 4.0
Heating:	Grade: 4.0
Plumbing:	Grade: 4.0
Electrical:	Grade: 3.0
Total Grade:	(3.6 + 3.3 + 3.6 + 3.3 + 3.8 + 3.6 + 4.0 + 4.0 + 4.0 + 3.0)/10 = 3.62

Total Grade (rounded) : 3.6

Chapter 4

The Cost Approach

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The most popular and effective method of property valuation is the cost approach.

This approach uses construction cost schedules.

These schedules show an average cost of construction for buildings according to their size, quality of construction, type of structure, and structural details.

Steps in the Cost Approach

To determine the value of improvements under the cost approach, an assessor must perform three steps:

1) Establish the replacement cost of the buildings:
    a. Measure and inspect the building;
    b. Establish grades for the ten components of structure; and
    c. Determine the replacement cost from cost schedules, based on building size and grade.

2) Establish depreciation and subtract from replacement cost:

a. Physical deterioration;
b. Functional obsolescence; and
c. External obsolescence.

3) Determine land value

Land value is determined through a municipality's land pricing schedules. Those pricing schedules are developed through analysis of land sales and other property sales with the improvement values removed. For purposes of this chapter, land values will be given.

Use of Cost Schedules

This text references the State of Maine Assessment Manual. This manual is used by Property Tax Division personnel in the valuation of property in the unorganized territory.

The grade of a building reflects only the quality of the building, the materials and workmanship, the level of detail, and quality of finish work. Cost varies with quality and any error or misjudgment in determining the quality of construction will adversely affect the final value estimate.

Current Cost Factor

The current cost factor is a periodic adjustment to the cost tables to reflect market fluctuations in construction costs over time. For example, if the cost schedules being used are ten years old, then the current cost factor adjusts the costs to reflect the changes over the last ten years. This cost factor is applied after replacement costs for all improvements have been estimated, and before depreciation is applied.

The International Association of Assessing Officers (IAAO) defines depreciation as:

“Loss in value of an object, relative to its replacement cost new, reproduction cost new, or original cost, whatever the cause of the loss in value. Depreciation is sometimes subdivided into three types: physical deterioration (wear and tear), functional obsolescence (suboptimal design in light of current technologies or tastes), and external obsolescence (poor location or radically diminished demand for the product)

Depreciation is the difference between replacement cost new and market value. This is also referred to “accrued depreciation”; it is the measure of the total value lost to depreciation.

Physical Deterioration

Physical deterioration is the wearing out of a structure.

It may be the result of wear and tear, use, or disuse.

Functional Obsolescence

The IAAO defines functional obsolescence as a "[l]oss in value of a property resulting from changes in tastes, preferences, technical innovations, or market standards."

Functional obsolescence is the result of causes contained within the structure itself

External Obsolescence

External obsolescence may be defined as a loss of value arising from causes external to the property

Chapter 5

The Market Approach

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The principle of substitution is the basis of this approach to value.

It is reliable, especially when there are sufficient sales to be considered.

Comparative Market Analysis

In a comparative market analysis, the comparable property – not the subject property – is adjusted.

If a comparable has a superior characteristic, then a subtraction adjustment is made to the comparable.

If a comparable has an inferior characteristic, an addition adjustment is made to the comparable.

Example. Comparative Market Analysis

Adjustments
- $25/sf for building area difference
- $1,500 for finished basement
- $500 for deck
- $5,000 for one-car detached garage

Elements	Subject	Comp 1	Comp 2	Comp 3
Sale Price	-----	$199,000	$206,000	$210,000
Size	1,180sf	1,080sf	1,220sf	1,320sf
Adjustment	------	$2,500	($1,000)	($3,500)
Basement	Unfinished	Unfinished	Unfinished	Finished
Adjustment	-----	-----	-----	($1,500)
Deck	Deck	Deck	None	Deck
Adjustment	-----	-----	$500	-----
Garage	None	None	None	one-car det
Adjustment	-----	-----	-----	($5,000)
# of Adjustments		1	2	3
Net Adjustment		+$2,500	-$500	-$10,000
Adjusted Sale Price		$201,500	$205,500	$200,000

Subject Value = $201,500

Explanation: The subject value is equal to the adjusted sale price for Comparable #1, which had the fewest number of adjustments. The fact that the adjusted sale price for this comparable also fell in between the other two adjusted sale prices provided support for using that value estimate.

Lot Size Adjustment

Determine the value of the subject lot:

$Value_{subject}$ = FF x FFV x FFF

Determine the value of the comparable lot:

$Value_{sale}$ = FF x FFV x FFF

Determine the differences in value of the lots.

Chapter 6

The Income Approach

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The income approach creates a value estimate for income-producing property based on the anticipated income from that property.

The income approach is sometimes referred to as the income capitalization approach, since the calculated value is the result of the application of a capitalization rate to estimated future income.

The capitalization rate converts the future income to a present value.

The basic formula for the income approach is:

$$I = R * V$$

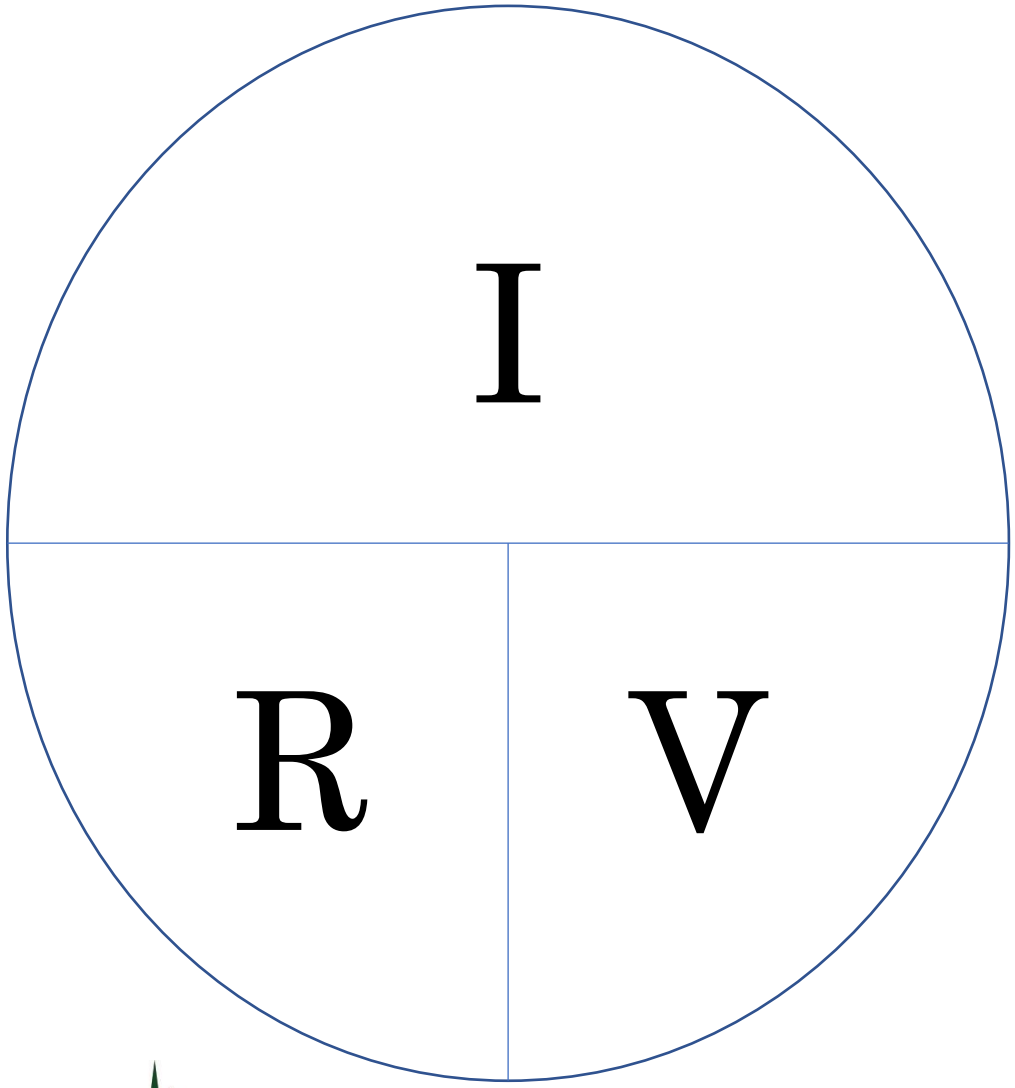
where I = Income

R = Rate

V = Value

Income is an estimate of future net operating income for the property.

Rate is the capitalization rate – or cap rate, for short.



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Definitions

• Potential Gross Income – The maximum revenue expected to be generated in the future. For purposes of direct capitalization, estimated income for the first year following the valuation date is used for potential gross income.

• Net Operating Income – Potential gross income, plus miscellaneous income, less vacancy and collection loss, less operating expenses.

• Miscellaneous Income – Income from sources incidental to the primary function of a property. For example, in rental property, miscellaneous income would be revenue generated from laundry facilities, garage or storage space.

• Vacancy and Collection Loss – Rent loss due to vacancy and loss from inability to collect all rent due.

• Operating Expenses – Generally, all recurring expenses that are subtracted from gross income to produce net operating income. Operating expenses fall into three categories:

1. Fixed costs, such as real estate taxes and mortgage loan payments;
2. Variable costs, such as administration, utilities, and supplies;
3. Replacement reserves – funds set aside for ongoing, periodic costs, such as roof repair.

- Recapture Rate – The annual rate at which an investment is returned over the economic life of property. The recapture rate applies only to buildings and other improvements. Land is not subject to a recapture rate because it generally does not have a finite economic life and does not lose value. The recapture rate is calculated by the equation: 1/(economic life of asset).

- Vacancy and Collection Loss – Rent loss due to vacancy and loss from inability to collect all rent due.

- Yield Capitalization – The yield capitalization method uses income estimates from multiple years following the valuation date to calculate the estimated value of income-producing property.

Potential gross income, plus miscellaneous income, less vacancy and collection loss, less operating expenses equal the property's net operating income (NOI).

PGI
\+ MI
\- VCL
\- OE
= NOI

Capitalization

Capitalization is the process of converting anticipated income from a property to a present value by dividing that income by an appropriate rate of return, called the capitalization rate.

When analyzing an income stream, investors commonly are concerned with two things:

1. The return of investment, or recapture of the initial amount of money invested; and

2. The return on investment, the amount of profit generated by the investment.

Steps in the Direct Capitalization Process

1. Determine net operating income (I):

	Potential gross income (PGI)
Plus:	Miscellaneous income (MI)
Less:	Vacancy and collection losses (VCL)
Less:	Operating expenses (OE)
Equals:	Net Operating Income

2. Determine capitalization rate (R)

	Recapture rate
Plus:	Effective tax rate
Plus:	Interest rate
Equals:	Capitalization Rate

3. Compute value (V)

V = Net operating income/capitalization rate

= I/R

Breakdown of Capitalization

$$V = V_{land} + V_{building}$$

$$I = I_{land} + I_{building}$$

$$R_{land} \quad R_{building}$$

*Note, the total R is NOT the $R_{land} + R_{building}$

Determining the Capitalization Rate

There are three components in a capitalization rate for developed property. They are:

- discount rate
    1. mortgage interest rate = return on borrowed funds
    2. equity yield rate = return on investor's equity

    For purposes of this text, we will assume that funds used for purchase of property are borrowed, meaning the discount rate will be equal to the mortgage interest rate.

- recapture rate

- effective tax rate

- R_{land} = discount rate + effective tax rate
- $R_{building} = R_{land}$ + recapture rate

Problem 6.3. Bob, a developer, is planning to build an apartment building on a vacant parcel of land for sale. He wants to know if the project is a good investment. To determine this, he needs an estimate of the property value including the land and building. Bob has put together the following estimates:

PGI = $35,000
MI = $1,500
VCL = 3.5% of PGI
OE = $8,750
Sale price of land = $50,000
Economic life of proposed building = 40 years
Current mortgage interest rate = 4.0%
Local tax rate = 20 mills
Municipal declared ratio = 90%

PGI = $35,000
MI = $1,500
VCL = 3.5% of PGI
OE = $8,750
Sale price of land = $50,000
Economic life of proposed building = 40 years
Current mortgage interest rate = 4.0%
Local tax rate = 20 mills
Municipal declared ratio = 90%

1) What is the net operating income?

PGI	= 35,000
MI	+ 1,500
VCL	- 1,225 (.035 x 35,000)
EGI	35,275
OE	- 8,750
NOI	26,525

PGI = $35,000
MI = $1,500
VCL = 3.5% of PGI
OE = $8,750
Sale price of land = $50,000
Economic life of proposed building = 40 years
Current mortgage interest rate = 4.0%
Local tax rate = 20 mills
Municipal declared ratio = 90%

2) Rate for the land = Effective tax Rate + Interest Rate

ETR = Declared Ratio X Mill Rate
ETR = 0.90 x .020
ETR =0.018

R_{land} = Interest Rate + ETR

0.04 + .018

R_{land} = 0.058

3) R for the Building ($R_{building}$) = R_{land} + Recapture

Recapture = 1/Economic Life of building

= 1/40

= 0.025

$R_{building}$ = 0.058 + .025

0.083

PGI = $35,000
MI = $1,500
VCL = 3.5% of PGI
OE = $8,750
Sale price of land = $50,000
Economic life of proposed building = 40 years
Current mortgage interest rate = 4.0%
Local tax rate = 20 mills
Municipal declared ratio = 90%

	Income	Rate	Value
Land	2,900	0.058	50,000
Building	23,625	0.083	284,638
Total	26,525		334,638

PGI = $35,000
MI = $1,500
VCL = 3.5% of PGI
OE = $8,750
Sale price of land = $50,000
Economic life of proposed building = 40 years
Current mortgage interest rate = 4.0%
Local tax rate = 20 mills
Municipal declared ratio = 90%

$Income_{Land} = Rate_{Land} \times Value_{Land}$

$Income_{Building} = Income_{Total} - Income_{Land}$

$Value_{Building} = Income_{Buliding} / Rate_{Building}$

Chapter 7

Sales Ratio Studies

The Maine Constitution requires, “all taxes upon real and personal estate, assessed by authority of this state, shall be apportioned and assessed equally according to the just value thereof.” In keeping with this constitutional provision, state of Maine law requires assessors to perform annual sales ratio studies (36 M.R.S. § 328(8)).

Definitions

The following definitions refer to this set of numbers.

	Sales	Assessed Values	Sales Ratio	Deviation
#1	$ 6,000	$ 3,600	60%	12
#2	$ 7,000	$ 4,500	64%	8
#3	$ 8,000	$ 5,600	70%	2
#4	$ 9,500	$ 6,700	71%	1
#5	$ 9,500	$ 6,700	71%	1
#6	$ 9,500	$ 6,700	71%	1
#7	$ 9,500	$ 6,700	71%	1
#8	$ 10,750	$ 7,700	72%	0
#9	$ 12,250	$ 9,000	73%	1
#10	$ 12,500	$ 9,400	75%	3
#11	$ 20,000	$ 17,000	85%	13
#12	$ 26,000	$ 25,000	96%	24
$\sum$	$140,500	$108,600	72%	67

Sales Ratio

The sales ratio is calculated by dividing a property's assessed value by its selling price.

For example, in the above set, the sales ratio for the first sale listed is $3,600/$6,000 = 0.60.

This means that the assessed value is 60% of market value.

Weighted average

The weighted average is calculated by dividing the total assessed values by the total sales prices for all sales in a sales ratio.

For the numbers above, the weighted average is calculated:

Assessed Values/Sales = $108,600/$140,500 = 0.7730 or 77.3%

Average ratio

The average ratio is calculated by summing the sales ratios in the central range of a ratio study (the central 70%, excluding the top 15% and the bottom15%) and dividing that sum by the total number of sales ratios in the central rangeof that study. In the above example, the average ratio is calculated as:

(70 + 71 + 71 + 71 + 71 + 72 + 73 + 75)/8 = 574/8 = 71.75, rounded to 72

Deviation.

The deviation for a single sale is equal to the absolute value of the difference between that property's sales ratio and the average ratio.

Average deviation

Average deviation is calculated by summing the deviations of all the sales ratios in a ratio study and dividing that sum by the total number of sales ratios in that study. In the above example, the average deviation is calculated as:

(12+8+2+1+1+1+0+1+3+13+24)/12 = 67/12 = 5.6

Median

The median value is the value at the midpoint of the range. The median is the value at which half of the samples are higher and half are lower.

In the above set, the median is between #6 and #7. When an even number of items are under study, the median is determined by averaging the two middle values.

The two middle values in this example are #6 $9,500 and #7 $9,500. The median is calculated as:

($9,500+$9,500)/2 = $9,500

Mode

The mode is the value occurring most frequently.

In the above number set, the mode is $9,500, since that value occurs four times, which is more often than any other number is repeated.

Quality rating

The quality rating, or coefficient of dispersion, for a municipality is calculated by dividing the average deviation by the average ratio and multiplying the result by 100.

Quality rating is a measure of how accurate a municipality's assessments are.

Maine law requires each municipality to maintain a quality rating of no higher than 20 (36 M.R.S. § 327). For the above example, the quality rating is calculated as:

(5.6/72) x 100 = 7.8