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Overview of the Income Approach

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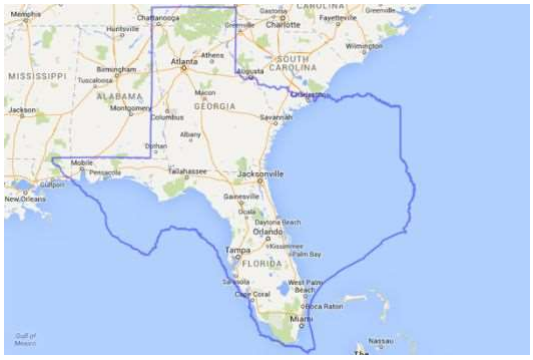
Lots of Counties In Georgia

Rank	Number of Counties	State
1	254	Texas
2	159	Georgia
3	133	Virginia
4	120	Kentucky
5	115	Missouri
6	105	Kansas
7	102	Illinois
8	100	North Carolina
9	99	Iowa
10	95	Tennessee



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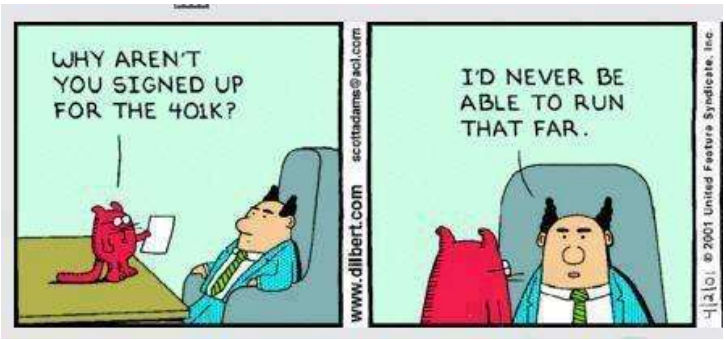
Understanding Investments



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Demand

Utility

Scarcity

Transferable

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Principles of Value

Principal of Anticipation

– Present worth of future benefit

Principal of Substitution

– Property is worth what one would pay for an equally desirable substitute

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Principles of Value

- **Principal of Competition**
  - Stabilizes prices
- **Principal of Change**
  - Real property is always in a state of change
- **Principal of Conformity**
  - Maximum value is achieved with homogeneity

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Principles of Value

- **Principal of Highest & Best Use**
  - Use that results in the greatest value
- **Principal of Supply and Demand**
  - Value results in the relative supply in relation to demand

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Principles of Value

- **Principal of Increasing Returns**
  - Dollar spent adds at least a dollar to value
- **Principal of Decreasing Returns**
  - Dollar spent does not add at least a dollar to value

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Principles of Value

- **Principal of Contribution**
  - Worth of an improvement is not determined by cost but by what it adds to the overall value

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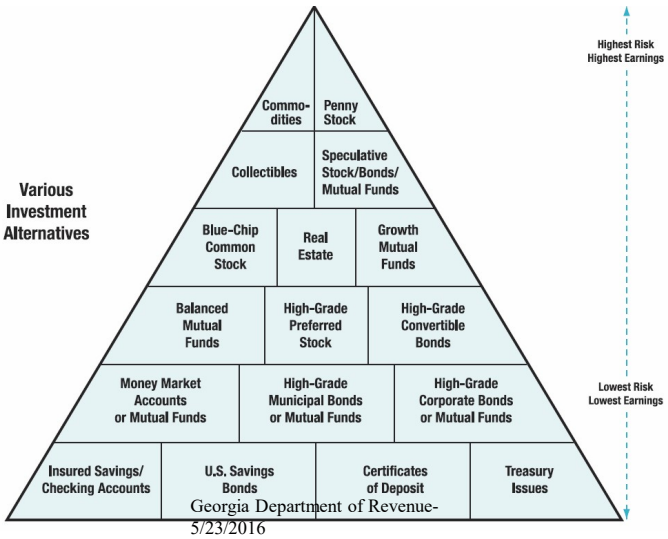

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Decisions ---- How to Decide ????

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NPV – Decision Rule

- ***If NPV is <u>positive</u>, accept the project***
- NPV > 0 means:
  - Project is expected to add value to the firm
  - Will increase the wealth of the owners
- NPV is a direct measure of how well this project will meet the goal of increasing owner's wealth.

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Sample Project Data

- You are looking at a new project and have estimated the following cash flows:
  - Year 0: CF = -165,000
  - Year 1: CF = 63,120
  - Year 2: CF = 70,800
  - Year 3: CF = 91,080
- Your required return for assets of this risk is 12%.

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Sample Project Data

Year 0:	(165,000)	1.000000	(165,000)
Year 1:	63,120	0.892857	56,357
Year 2:	70,800	0.797194	56,441
Year 3:	91,080	0.711780	64,829
		Net Present Value	12,627

Positive Net Present Value !!!

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Another Sample Project ------

Year	0	Cash Flow	(1,900,000)
Year	1	Cash Flow	300,000
Year	2	Cash Flow	350,000
Year	3	Cash Flow	350,000
Year	4	Cash Flow	350,000
Year	5	Cash Flow	350,000
Year	6	Cash Flow	350,000
Year	7	Cash Flow	350,000
Year	8	Cash Flow	375,000
Year	9	Cash Flow	375,000
Year	10	Cash Flow	375,000

Required Rate of Return: 12%

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Another Sample Project ------

Year	0	(1,900,000)	1.000000	(1,900,000)
Year	1	300,000	0.892857	267,857
Year	2	350,000	0.797194	279,018
Year	3	350,000	0.711780	249,123
Year	4	350,000	0.635518	222,431
Year	5	350,000	0.567427	198,599
Year	6	350,000	0.506631	177,321
Year	7	350,000	0.452349	158,322
Year	8	375,000	0.403883	151,456
Year	9	375,000	0.360610	135,229
Year	10	375,000	0.321973	120,740
			Net Present Value	(60,643)

Negative Net Present Value!

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Another Sample Project ------

($60,643) Net Present Value – Why would I consider this investment?

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Incentives - Inducements

Production Tax Credits
LIHTCs
Others……

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$$Value = \frac{Income}{Rate}$$

(Universal income approach formula)

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Income Formula

- The formula only has 3 working parts.
  - **Value**
  - **Income**
  - **Rate**

Knowing any 2 of the parts, you can solve for the other.

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What Kind of Value???

What about the *Value?*

The value is typically *market value* when appraising for ad valorem property tax purposes.

"In the nineteenth century, property taxes began to be based on *market value* as determined by qualified professionals." [*Property Assessment Valuation*, 3rd ed. (IAAO) p. 1.]

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What About Income?

What about the Income?

The annual "income" figures used in appraising income-producing properties are '*cash flows' at some level* rather than accrual accounting incomes.

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Rates?????

What about the *Rate?*

The rate is the overall capitalization rate (R_O).

An overall capitalization rate *(R_O)* is a rate that reflects the relationship between a single year's net operating income and the total property value. [*The Appraisal of Real Estate*, 13th ed. (Chicago: AI, 2008), p. 462.]

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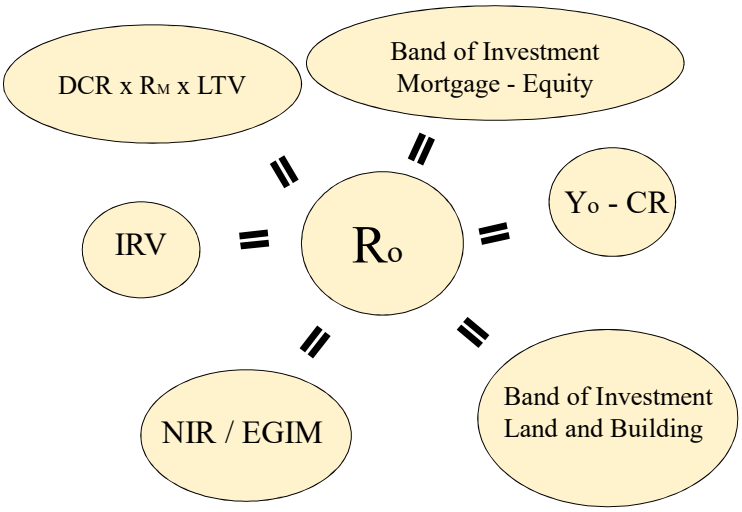

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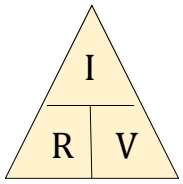
Market Comparison - IRV

Sale Number	Sale Price	Net Operating Income	Overall Cap Rate
1	1,527,059	137,435	9.00%
2	1,550,222	135,644	8.75%
3	1,560,000	140,400	9.00%
4	1,542,386	145,447	9.43%
5	1,571,250	141,413	9.00%
6	1,465,263	135,537	9.25%



Income = Rate x Value
Rate = Income ÷ Value
Value = Income ÷ Rate

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Band of Investment – Mortgage and Equity

What is it?

It is a blending of the weighted rates of mortgage and equity into an overall rate.

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Components Needed for Calculation

Loan Terms:

Interest Rate
Frequency of Payments
Length of Loan

Investor Yield Requirements

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Components Needed for Calculation

Calculation of Annual Mortgage Constant

…… also called "mortgage capitalization rate" (R_M) is the capitalization rate for debt. A mortgage constant is a rate that appraisers determine for use in the band of investment approach.

It is represented by the formula below or can be calculated using Excel, a financial calculator, or compound interest tables.

$$\text{Mortgage constant} = \frac{\text{annual debt service}}{\text{mortgage principal}}$$

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Band of Investment

Mortgage Constant Calculation

Mortgage Rate		6.00%
Term		20 Years
Mortgage Constant Calculation		
= PMT((0.06/12),(20*12),-1,0)*12		**0.0859710**

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Band of Investment

Mortgage Rate: 6%, Monthly Payments					
20 Year Term, Loan to Value Ratio 80%					
Equity Return Required 12%					
Financial Component	Ratio of Financing Component		Rates		Weighted Average
Debt	0.80	x	0.08597	=	0.06878
Equity	0.20	x	0.12	=	0.02400
					0.09278
			R_O	=	9.3%

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What's Missing in our BOI ??

- As Applied in Direct Cap Will Not Consider:
  -Change in value during the holding period
  -Change in income during the holding period
- Variable Rate Financing
- Going In vs. Going out Cap Rates
- Mortgage Equity Changes
- No Implicit Real Estate Tax Rate

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Debt Coverage Ratio Method

Formula:

$$R_O = DCR \times R_M \times LTV$$

DCR = Debt Coverage Ratio
RM = Mortgage Capitalization Rate
LTV = Loan to Value Ratio (M)

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Debt Coverage Ratio

The debt coverage ratio measures the ability to pay the property's monthly mortgage payments from the cash generated from renting the property. Lenders use this ratio as an indication of solvency.

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Debt Coverage Ratio

The DCR is calculated by dividing the property's annual net operating income (NOI) by a property's annual debt service. Annual debt service is annual total of your mortgage payments (i.e. the principal and accrued interest, but not your escrow payments).

$$DCR = \frac{Net\ Operating\ Income}{Annual\ Debt\ Service}$$

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Debt Coverage Ratio

Assume NOI of $20,000 and mortgage payments of $15,000.

The DCR is:

$$\frac{\$20,000}{\$15,000} = 1.3$$

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Debt Coverage Ratio Method

Net Operating Income =	20,000		**R_M**		**LTV (M)**
Annual Debt Service =	15,000		0.08597		80%
R_O =	DCR	x	R_M	x	LTV
R_O =	1.3	x	0.08597	x	0.80
	0.0894				
R_O =	8.9%				

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Cap Rate or Yield Rate

Sometimes, the ***Rate*** can be both the Overall Cap Rate (R_O) and the Discount Rate (Y_O)?????????

If the **income** and **value** are expected to remain the same for the holding period, the **R_O** = **Y_O**.

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Is There a Difference?

Sooooo……what is the difference between an **R_O** and a **Y_O**?

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Capitalization Rate

- ✓ A Cap rate (R_O) is the ratio between income and value.
- ✓ A Cap rate (R_O) is the percentage of value that income represents.
- ✓ A Cap rate (R_O) is used in Direct Capitalization.

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Yield Rate

- ✓ An Overall Yield Rate (Y_O) is a rate of return on total capital invested.
- ✓ It considers all changes in income and value over the holding period.
- ✓ An Overall Yield Rate (Y_O) is used in Yield Capitalization.

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A Cap Rate (R_O) and a Yield Rate (Y_O) are the same numerically ***only*** *when….*

both **income** and **value** are expected to remain <u>unchanged</u> during the holding period.

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Numbers in the Simple Formula

$$Value = \frac{Income}{Rate}$$

$$Value = \frac{\$20{,}000}{.09}$$

$$Value = \$222{,}222$$

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What Rate in Formula

- What are implications of $Value = \frac{Income}{Rate}$?
  - Is Cap Rate (R_O) = Discount Rate (Y_O)?

A. Yes
- Value is level
- Value is perpetual
- Income is level
- Income is perpetual

B. No
- At least one of items in A is not true

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Application of Income Approach

What else do we need to know to effectively use $Value = \frac{Income}{Rate}$?

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More About the Income

What is the pattern of income?

What about growth?

Growth (change) in Income?
Growth (change) in Value?

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Pick Your Rate

What kind of **Rate** to use?

Discount Rate (Y_O, WACC, or K)
Yield Capitalization
Overall Cap Rate (R_O)
Direct Capitalization

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Growth Adjusted Formula

If income and value are changing at the same rate, then a variation of the basic formula can be used:

Value = Income / Discount Rate – Change Rate

$$V = \frac{Income}{Y_o - change}$$

This formula converts a discount rate (Y_O) into an overall cap rate (R_O).

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Some Quick Application

Your Chief Appraiser says to you, **"I know you have been to some appraisal courses and I need some help. What is the value a property that is expected to generate the following income?"**

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Tell Me About the Income

Year	Income
1	25,300
2	17,250
3	20,700
4	32,200
5	37,950

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A Little More Info

You say, "Sure, no problem. What discount rate should I use?"
Your CA says, "**Use 10%....that should be fine.**"

You say, "OK, fine. Here's your answer."

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Textbook Answer????

Discount Rate =			10%
Year	Income	PVIF	Present Value
1	25,300	0.909091	23,000
2	17,250	0.826446	14,256
3	20,700	0.751315	15,552
4	32,200	0.683013	21,993
5	37,950	0.620921	23,564
		Total Present Value	98,365

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Hard to Satisfy Boss

The Chief Appraiser says, "**Are you sure? I think the property should be worth more than that**."
You think to yourself, "What did I do wrong?"
Any ideas?

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Something to Ponder

Is the ***$98,365*** the value of the ***income*** or the value of the ***property***?

It depends.

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Back to Earlier Rate Facts

Is the *cap rate* (R_o) equal to the *discount rate* (Y_o) ?

Yes: Then there can be **no change in value** of the property.

No: Then there **must be a change in value** of the property.

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More Information

Then you realize that the CA has not given you enough information.

You ask, "What do you expect the value of the property to be at the end of 5 years?"

Your boss says, "**Probably about the same as it is today**."

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Slick Tricks of the Income Approach

Now, do you have enough information to solve the problem?

Of course you do. You know the universal income formula.

$$Value = \frac{Income}{Rate}$$

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Slick Tricks of the Income Approach

You know the income and you know the rate…. So now you can solve the problem.

So how do you solve it?

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Slick Tricks of the Income Approach

Suddenly, you remember….

- Your Income Capitalization Course
- *Property Assessment Valuation*, 3rd ed., p. 385
- *The Appraisal of Real Estate*, 13th ed., p. 537

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Remembering How It Works

When you know the annual cash flows and the ending value, just discount all the cash flows to present value at the discount rate (Y_O).

However, if you only know the annual cash flows, then it is useful to convert the discount rate (Y_O) into an overall cap rate (R_O).

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Level Equivalent Income

Any pattern of income can be converted into a level-equivalent income.[1]

[1] *The Appraisal of Real Estate*, 13th ed. (Appraisal Institute, 2008) p. 537.

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How It Works – Slick Tricks

To convert an income stream into its level equivalent:

1. Calculate the present value of the irregular income stream at the appropriate yield rate.

2. Calculate the level payment that has the same present value.

[1] *The Appraisal of Real Estate*, 13th ed. (Appraisal Institute, 2008) p. 531.

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How does that work?

Find the level equivalent of the following cash flows at a 10% discount rate.

Year	Income
1	25,300
2	17,250
3	20,700
4	32,200
5	37,950

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Slick Tricks of the Income Approach

DCF Model - Level Equivalent Income

	Discount Rate =			10%
	Income Rate of Change			Variable
	Value Change Over the Holding Period			0%
	Year	Income	PVIF	Present Value
	1	25,300	0.909091	23,000
	2	17,250	0.826446	14,256
	3	20,700	0.751315	15,552
	4	32,200	0.683013	21,993
	5	37,950	0.620921	23,564
			Total Present Value	98,365
Multiply by the Amortization Factor (5 years)				0.263797
			Level Equivalent Income	25,949

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Slick Tricks of the Income Approach

Since there is expected to be no change in value over the holding period, we can simply divide the level equivalent income by the discount rate.

$$Value = \frac{Income}{Rate}$$

Income =	25,949
Yield Rate =	.10

Value = 259,485

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Finally – A Satisfactory Answer

The Chief Appraiser says, that looks like a better answer, **"Can you prove that?"**

You reply, "here's the proof."

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Slick Tricks of the Income Approach

Proof:			
Current Market Value			259,485
Value Change multiplier over 5 years =			100.00%
Future Value =			259,485
Present Worth Factor =			0.620921
Present Worth of Reversion =			161,120
Add Present Worth of Cash Flows =			98,365
Total Value of Property			259,485

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A Job Well Done

Finally, your Chief Appraiser says,
"Thanks for your help – you deserve a raise."

You reply, "**I agree**!"

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Summary of Approaches

What about Direct Capitalization?

– The math is simple (only 3 working parts)

– However the analysis should be as extensive as in yield capitalization

- **What about Yield Capitalization?**

– The math is more complex

– It considers holding period, income for period, yield rate, change in income over holding period, and property reversion

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Summary of Approaches

"While direct capitalization looks easy, it requires all the analysis that would be necessary to perform a discounted cash flow analysis in the yield capitalization method."[1]

1Lenhoff, David C. "Direct Capitalization: It Might Be Simple But It Isn't That Easy," (*The Appraisal Journal*, Appraisal Institute, Winter 2011, p. 66).

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Summary of Approaches

One absolute constant between direct and yield capitalization:

Value does not change with the method used.

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Information Sources

- Testing the numbers for reasonableness requires assessors to collect as much information as possible.
- The best sources to verify sale and income information are the buyers, sellers and brokers.

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Other Information Sources

- Local and National Real Estate Brokers and Management Publications.
- Local Bankers
- Newspapers
- Other Assessors and Appraisers

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Other Information Sources

Korpacz Investor Survey

- Excellent source for general cap rate and income information.
- Beware of disclaimer and NOI calculation methods.
- Always verify the information using local information.

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Other Information Sources

Master Money Matrix published by Fantini and Gorga

- Provides mortgage and lending information including rates, LTV ratios, Debt Coverage Ratios, and typical mortgage terms for multiple property types.
- http://www.fantinigorga.com

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Other Information Sources

Bloomberg.com

Excellent source for rate and investment information.

Updated daily.

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Other Information Sources

National Investor Center for Senior Housing and Care Industry

- Provides key financial indicators including capitalization rates for senior housing and care including nursing homes, assisted living, and continuing care residential units .
- http://www.nic.org

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Other Information Sources

Building Owners and Managers Association

BOMA

- Experience Exchange Report
- Provides detailed building income and expense information.

http://www.boma.org

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Other Information Sources

International Real Estate Managers

IREM

- Income /Expense Analysis
- Provides detailed building income and expense information.

http://www.irem.org

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Other Information Sources

Real Estate Research Corporation
http://research.rerc.com

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Other Information Sources

Realtyrates.com

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Other Information Sources

- NAI Hunneman
- Spaulding & Slye
- www.bostonapartmentmarket.com
- CBRE
- Grub & Ellis
- U.S Realty Consultants
- Federal Reserve Bank
- Finard & Company
- The Warren Group (Banker & Tradesman)
- Meredith & Grew
- Codman Company
- Costar

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