



NAREA

Address: 14034 S. 145 E.

STE 100

Draper, Utah 84020

(801) 931-5571

info@nareagroup.org



HOW TO BUILD A REAL ESTATE INVESTMENT ANALYSIS MODEL **By Ken Holman**

Analyzing commercial or residential properties requires two types of analyses: (1) Project Analysis, and (2) Investment Analysis.

Property analysis evaluates the property itself. If it has an operating history, how has it performed in the past itself and how it has performed in the market among similar competing properties. Property analysis involves doing a lot of due diligence and using financial metrics to make decisions about the property. (Due Diligence Checklist)

One of the most popular metrics is the capitalization rate. The capitalization rate is the rate of return on a real estate investment based on the expected Net Operating Income the property will generate. It is calculated by dividing the Net Operating Income by the current Market Value of the property.

$$I / V = R \text{ or } I / R = V \text{ (The IRV Formula)}$$

Investment analysis determines how a property has performed in the past and projects how it will likely perform in the future. It takes historical information regarding income and expenses and projects into the future the anticipated year-by-year cash flow and the expected internal rate of return when the property is sold.

Investment analysis requires eight different steps:

- 1) Determining the recent Historical Performance of the Property;
- 2) Setting up the Cash Flow Model;
- 3) Projecting the Net Operating Income and Net Cash Flow;
- 4) Calculating the Projected Sale Price of the Property;
- 5) Determining the Adjusted Basis;
- 6) Calculating the Gain or Loss on Sale;
- 7) Calculating the Net Sale Proceeds; and
- 8) Calculating the Internal Rate of Return on the Property;

Historical Performance of the Property

Establish the recent historical performance of the property is key to determining how the property will perform in the future. If the historical performance of the property is incorrect, the investment analysis could be fatally flawed.

One of the best ways to establish the recent historical performance of a property is to obtain copies of the last few years of financial statements. Typically, the seller of the property is reluctant or unwilling to provide this information and often relies on the commercial real estate listing broker to give an overview of the financial performance of the property that may not be reliable.

Even if this information is factually accurate, it may not reflect how the property could perform in the future given an infusion of capital. Therefore, it's critical that the prospective buyer put together his own summary of the historical financial performance of the property.

This will involve obtaining a current rent roll and copies of leases to determine the unit or square footage composition, who the tenants are, what their current rent or lease payments have been, any projected rent or lease payment changes that will occur in the future, and any delinquent rent or lease payments that are outstanding.

Obtaining accurate historical financial information also requires documenting the operating expenses of the property including, but not limited to: payroll expenses, utility costs, existing service contracts, repair and maintenance expenses, administrative and management fees, property taxes (both real and personal), and property insurance.

Unless the buyer is assuming the existing mortgage, there is little need to obtain information on the existing mortgage or debt structure of the property, unless the buyer intends to assume the existing debt or plans on carrying back a mortgage from the seller.

When collecting all the relevant recent historical information, it is helpful to prepare a Project Information Summary that outlines this information. It is also helpful to establish a starting Net Operating Income, an Initial Capitalization Rate, the anticipated Loan-to-Value (LTV) ratio, and information regarding the Equity Investment, the Loan terms, the Building Value and Depreciation schedule, and any Assumptions that are being used to calculate future income, expenses and value.

Setting Up the Cash Flow Model

The primary goal of investing in real estate is to make a profit on the investment by generating more income than is being paid out in operating expenses and servicing the debt. The Cash Flow Model is the standard approach used to determine the Net Operating Income and Net Cash Flow of the property. The basic Cash Flow Model is as follows:


	Gross Scheduled Income (GSI)	
(-)	Vacancy & Collection Loss	
(+)	Other Income	
(=)	Effective Gross Income (EGI)	
(-)	Operating Expenses (OE)	
(=)	Net Operating Income (NOI)	
(-)	Annual Debt Service (ADS)	
(=)	Net Cash Flow	

Projecting Net Operating Income and Net Cash Flow

Net Operating Income (NOI) is the actual or anticipated net income remaining after all operating expenses have been deducted from the Effective Gross Income. Net Operating Income is determined before any debt service is considered because the debt structure for each buyer may be different based on credit worthiness and appetite for debt. Net Operating Income is customarily expressed as an annual amount.

Net Operating Income (NOI) is the figure most real estate appraisers and commercial real estate brokers use to determine the value of an income-producing real estate investment. Appraisers calculate the value of an income-producing property using the Direct Capitalization approach. It is the process of converting the future Net Operating Income stream into a Present Value (PV) by dividing the NOI by a capitalization rate (Cap Rate).

Real estate professionals generally have access to financial information on properties that help them determine the value of an asset within a given range of values. They use the IRV formula for direct capitalization as follows: $I / R = V$ where “I” represents the Net Operating Income (NOI), “R” represents the Capitalization Rate and “V” represents the purchase or sale price of the property, depending on whether the property is being bought or sold.



The primary benefit of the Capitalization Rate is that it's widely recognized in the real estate industry and the advantage of using the Direct Capitalization method is its simplicity. It's easy to calculate and, since it incorporates Net Operating Income into the equation, it factors in vacancy, credit loss and operating expenses.

The simplicity of the Direct Capitalization method, however, is also a limiting factor. It does not consider the impact of financing nor can it be calculated with exact precision. Therefore, a small change in the Cap Rate can equate to a big change in the value, so be careful when using it and stay conservative.

Once the baseline financial projection has been made for the first year, these numbers are projected out over a period of five-to-ten years based on the assumptions that are made for inflation, future vacancy rates, appreciation in the value of the asset, and the capitalization rate applied to the sale of the asset.

FIVE-YEAR CASH FLOW PROJECTION

	%	1	2	3	4	5
Unit Summary						
1Bd/1Bth (40 Units)		\$384,000	\$395,520	\$407,386	\$419,607	\$432,195
2Bd/2Bth (50 Units)		\$600,000	\$618,000	\$636,540	\$655,636	\$675,35
3Bd/2Bth (10 Units)		\$144,000	\$148,320	\$152,770	\$157,353	\$162,073
REVENUE						
Gross Scheduled Income		\$1,128,000	\$1,161,840	\$1,196,695	\$1,232,596	\$1,269,574
Vacancy	7.0%	\$78,960	\$81,329	\$83,769	\$86,282	\$88,870
Other Income		\$23,275	\$23,973	\$24,692	\$25,433	\$26,196
Effective Gross Income	100.0%	\$1,072,315	\$1,104,484	\$1,137,619	\$1,171,748	\$1,206,900
OPERATING EXPENSES						
Payroll Expenses	9.5%	\$102,960	\$106,049	\$109,230	\$112,507	\$115,882
Utilities & Services	7.0%	\$72,400	\$74,572	\$76,809	\$79,113	\$81,487
Repairs & Maintenance	11.0%	\$122,300	\$125,969	\$129,748	\$133,641	\$137,650
Administrative	6.0%	\$20,600	\$44,180	\$45,505	\$22,510	\$23,185
Taxes & Insurance	6.5%	\$67,500	\$69,525	\$71,610	\$73,759	\$75,971
TOTAL OP EXPENSES	40.0%	\$428,653	\$441,513	\$454,758	\$468,401	\$482,453
NET OPERATING INCOME						
	60.0%	\$643,662	\$662,972	\$682,861	\$703,347	\$724,447
Mortgage Interest						
		\$405,266	\$399,107	\$392,632	\$385,826	\$378,672
Principal Payments						
		\$120,390	\$126,549	\$133,024	\$139,829	\$146,983
Annual Debt Service						
		\$525,656	\$525,656	\$525,656	\$525,656	\$525,656
NET CASH FLOW						
		\$118,006	\$137,316	\$157,205	\$177,691	\$198,792
(+/-) Principal Payments						
		\$120,390	\$126,549	\$133,024	\$139,830	\$146,984
(-) Depreciation						
		\$301,818	\$301,818	\$301,818	\$301,818	\$301,818
NET INCOME						
		-\$63,695	-\$38,234	-\$11,405	\$15,405	\$43,650

Determining Gain or Loss on Sale

Gain or loss is usually realized when a real estate property is sold or exchanged. A gain occurs when the amount realized from the sale or exchange of property is greater than the adjusted basis. A loss occurs when the amount realized from the sale or exchange of the property is less than the adjusted basis.

Real estate held for more than one year before being sold will be taxed at the long-term capital gains rate. Real estate held for one year or less before being sold will be taxed at the short-term rate. Capital gains or losses must be reported to the Internal Revenue Service on form Schedule D. Below is a table showing the Long-Term and Short-Term Capital Gain Rates.

Ordinary Income Tax Rate	Single	Long-Term Capital Gain Rate for Single	Married Filing Jointly	Long-Term Capital Gain Rate	Short-Term Capital Gain Rate	Recapture Rate on Long-Term
10%	\$0 - \$9,700	0%	\$0 to \$19,400	0%	10%	10%
12%	\$9,701 - \$39,475	0% to \$39,375 or below	\$19,401 to \$78,950	0% to \$78,750	12%	15%
22%	\$39,476 - \$84,200	15%	\$78,951 to \$168,400	15%	22%	25%
24%	\$84,201 - \$160,725	15%	\$168,401 to \$321,450	15%	24%	25%
32%	\$160,726 - \$204,100	15%	\$321,451 to \$408,200	15%	32%	25%
35%	\$204,101 - \$510,300	15% to \$434,550 then 20%	\$408,201 to \$612,350	15% to \$488,850 then 20%	35%	25%
37%	\$510,301 +	20%	\$612,351 +	20%	37%	25%

Note: The Affordable Care Act (Obamacare) has imposed a surtax of 3.8 percent on investment income if Adjusted Gross Income is greater than \$200,000 for a single person or greater than \$250,000 for a married couple filing jointly.

For purposes of investment analysis, there are four calculations that must occur:

- 1) A projection of the Sale Price at disposition;
- 2) A calculation of the Adjusted Basis;
- 3) A calculation of the Capital Gain; and
- 4) A calculation of the Net Sales Proceeds.

Calculating the Projected Sale Price of the Property.

The projected sale price of the property is calculated by determining the Net Operating Income of the property at the end of the anticipated holding period by dividing the NOI by a reasonable capitalization rate.

For example, if the fifth year Net Operating Income was \$724,140 and the assumed capitalization rate was 6.0%, the projected sale price would be \$12,069,000, which would usually be rounded to \$12,000,000.

$$\$724,140 / .060 = \$12,069,000$$

Some analysts use the NOI derived at the end of the holding period and some use the NOI derived for the year after the end of the holding period. For instance, if you were determining the disposition price at the end of a five-year holding period, you would select the NOI estimated at the end of year five or the estimated NOI at the end of year six. The more conservative approach would be to select end of year five NOI rather than select end of year six NOI.

Calculating the Adjusted Basis.

The calculation for adjusted basis, used for tax purposes, is the value of the property when it was originally acquired including any acquisition costs and capital improvements made over time less any deductions taken for depreciation.

Calculating the Capital Gain or Loss.

A capital gain is the amount by which the asset's selling price exceeds its adjusted basis, i.e., the initial purchase price adjusted for any capital improvements and depreciation. A capital loss is the amount by which the asset's selling price is less than its adjusted basis.

The capital gain is divided into two categories: (1) gain attributable to depreciation, and (2) gain attributable to appreciation. Any gain attributable to depreciation is generally taxed at the depreciation recapture rate of 25 percent. Any gain attributable to appreciation is generally taxed at the long-term capital gain rate, which, for most people is 15 percent.

Calculating the Net Sales Proceeds after Tax.

The net sales proceeds are calculated by taking the sale price and subtracting any disposition costs, like closing costs and real estate commissions, and the remaining mortgage balance on the property. Added to the sale price is any remaining balance for reserves that belong to the seller.

GAIN ON SALE

Calculation of Adjusted Basis, Capital Gain & Net Sales Proceeds		
	Projected Sale Price	\$12,000,000
Calculation of Adjusted Basis		
	Original Purchase Price	\$10,200,000
(+)	Acquisition Costs	\$309,800
(+)	Capital Improvements	\$200,000
(-)	Accumulated Depreciation	\$1,509,090
(=)	Adjusted Basis at Sale	\$9,200,710
Calculation of Capital Gain		
	Sale Price	\$12,000,000
(-)	Disposition Costs	\$480,000
(-)	Adjusted Basis at Sale	\$9,200,710
(=)	Gain on Sale	\$2,319,290
(-)	Gain Attributable to Depreciation	\$1,509,090
(=)	Gain Attributable to Appreciation	\$810,200
Calculation of Net Sales Proceeds		
	Sale Price	\$12,000,000
(-)	Disposition Costs	\$480,000
(-)	Mortgage Balance EOY 5	\$7,493,225
(+)	Reserve Balance	0
(=)	Sale Proceeds Before Tax	\$4,026,775
(-)	Tax on Depreciation Recapture (25%)	\$377,273
(-)	Tax on Capital Gain (15%)	\$121,530
(=)	Net Sale Proceeds After Tax	\$3,527,973

Calculating the Internal Rate of Return

The Internal Rate of Return (IRR) is the yield rate that is earned for a given capital investment over the holding period. It equates the present value of the future benefits of the investment to the amount of capital invested. It applies to all expected benefits, including the net proceeds at disposition and can be used to measure the return on any capital investment before or after taxes.

In a real estate investment, as in other investments, the Internal Rate of Return (IRR) is the return each dollar earns while it is in the investment. IRR is another term for interest rate, discount rate, or yield. To have a return on an investment, dollars received must exceed dollars put into the investment. The rate of return on the investment depends on both the amount of the excess received and the timing of when the excess is received.

The following Time Value of Money Grid illustrates the amount received in each period and the time those amounts were received.

INTERNAL RATE OF RETURN

Internal Rate of Return Calculations		
EOY		
0	Initial Investment	-\$2,040,000
1	Net Cash Flow Year 1	\$118,006
2	Net Cash Flow Year 2	\$137,316
3	Net Cash Flow Year 3	\$157,205
4	Net Cash Flow Year 4	\$177,691
5	Net Cash Flow Year 5 + Net Sale Proceeds	\$198,792 + \$3,580,549 = \$3,779,341
	IRR	.1797 or 17.97%

The Internal Rate of Return can be calculated by using either a financial calculator, an Excel spreadsheet, or NAREA's Investment Analysis Model.

INTERNAL RATE OF RETURN

In a real estate investment, as in other investments, the Internal Rate of Return (IRR) is the return each dollar earns while it is in the investment. IRR is another term for interest rate, discount rate, or yield. The IRR gives investors the means to compare alternative investments based on their yield.

IRR isolates the return on [each] portion of the total amount of money received from the investment over the holding period. To have a return on investment, dollars received must exceed dollars put into the investment. This return on [investment] rate depends on both the amount of the excess [received] and when the excess is received.

Keystrokes for HP 10bII+ Financial Calculator

- 1) Clear the cash flow memory.**
Keystrokes: Push the blue up-arrow key followed by the C MEM/C/C ALL key followed by the 0 key.
- 2) Enter the number of periods per year (default is 12).** For annual cash flows, P/YR should be set to 1; for monthly cash flows, use the default setting, 12.
Keystrokes: (For annual cash flow) Push the 1 key followed by the orange down-arrow key followed by the PMT/P/YR key.
- 3) Enter the cash flows starting with period 0.**
Keystrokes: Enter the initial cash outlay by entering in the number followed by the (+/-) key. Enter subsequent annual cash flows by entering in the number followed by the CF_j key. (The financial calculator keeps track of each period). For the final cash flow add both the annual cash flow amount and the net cash received upon sale followed by the CF_j key.
- 4) Calculate the Internal Rate of Return per year.**
Keystrokes: Press the orange down-arrow key followed by the CST/IRR/YR key. The percentage number shown on the screen is the IRR percentage.

Keystrokes for HP 12C Financial Calculator

- 1) Clear the cash flow memory.**
Keystrokes: Push the yellow key [f] follow by the [REG/CLX] key.
- 2) Enter the cash flows starting with period 0.**
Keystrokes: Enter the initial cash outlay by entering in the number followed by the [CHS] key followed by the blue [g] key followed by the [PV/CF₀] key. Enter subsequent annual cash flows by entering the number followed by the blue key [g] followed by the [PMT/CF_j] key. (The financial calculator keeps track of each period. If the payments are the same for each period, enter the number of periods the payment is the same followed by the blue key [g] followed by [FV/N_j] key). For the final cash flow add both the annual cash flow amount and the net cash received upon sale followed by the [PMT/CF_j] key.
- 3) Calculate the Internal Rate of Return per year.**
Keystrokes: Press the yellow [f] key followed by the [IRR/FV] key. The percentage number shown on the screen is the IRR percentage.

Keystrokes for Microsoft Excel

- 1) Enter the time periods down the column starting with [0].**
Keystrokes: Put 0 in cell A1, followed by 1 in cell A2, A3, etc.

- 2) **In the cell next to the time period, enter the cash flow.**

Keystrokes: Enter the initial cash flow (with a minus sign) in cell B1, followed by subsequent cash flows in cells B2, B3, etc. Remember to add the annual cash flow to the net cash received at the sale for the last cash flow entry.

- 3) **Solve for IRR.**

Keystrokes: In the cell following the column of cash flows enter @irr followed by a (then scroll up to the initial cash flow by pushing the up arrow key, then push the period button and scroll down the column using the down arrow key to the last cash flow followed by) then push enter.

Calculating IRR Given a Single Amount Received and/or an Annuity

The following sample problems illustrate how to calculate IRR for a singled amount received and for an annuity. The problems used to calculate IRR are set up the same way as the Time Value of Money (TVM) calculations, except they solve for *I*, the interest rate.

Sample Problem 3-7: Calculating the IRR of a Single Amount Received

In an investor pays \$10,000 for an investment today that is expected to produce net sales proceeds of \$30,000 at the end of year 10, what is the IRR?

- 1) Set up a TVM-Grid with annual compounding (one payment per year).

N	I/YR	PV	PMT	FV
0	?	(\$10,000)		
1-9			\$0	
10			\$0	\$30,000

N: $10 \times 1 = 10$

I: Unknown

- 2) Transfer the TVM-Grid to a financial calculator and solve for the interest rate per year, I/YR.

N	I/YR	PV	PMT	FV
0		(\$10,000)		
1-9			\$0	
10	11.61%		\$0	\$30,000

In this example, the sale proceeds are the only cash flow received and they are greater than the initial investment amount. Therefore, the return of the initial investment (\$10,000) and the yield (Return On Investment) comes from this single cash flow. The amount of interest earned each year is being left in the investment, thus increasing the amount that is invested each year.

Sample Problem 3-8: Calculating the IRR of an Annuity Plus a Single Amount Received

If an investment requiring an initial investment of \$20,000 is projected to produce Net Operating Income of \$3,000 per year for five years and will be sold at the end of the fifth year for a net amount of \$25,000 after all closing costs, loan repayments, and real estate commissions, what is the projected IRR?

- 1) Set up a TVM-Grid with annual compounding (one payment per year).

N	I/YR	PV	PMT	FV
0	?	(\$20,000)		
1			\$3,000	
2			\$3,000	
3			\$3,000	
4			\$3,000	
5			\$3,000	\$25,000

N: $5 \times 1 = 5$ I: Unknown

- 2) Transfer the TVM-Grid to a financial calculator and solve for the interest rate per year, I/YR.

N	I/YR	PV	PMT	FV
0	?	(\$20,000)		
1			\$3,000	
2			\$3,000	
3			\$3,000	
4			\$3,000	
5			\$3,000	\$25,000

I/YR = 18.46%

Sample Problem 3-9: Calculating the IRR with Variable Cash Flows Plus a Single Amount Received

If an investment requiring an initial investment of \$20,000 is projected to produce Net Operating Income of \$3,000, \$4,000, \$5,000, \$6,000 and \$7,000 for five consecutive years and will be sold at the end of the fifth year for a net amount of \$25,000 after all closing costs, loan repayments, and real estate commissions, what is the projected IRR?

- 1) Set up a TVM-Grid with annual compounding (one payment per year).

N	I/YR	PV	PMT	FV
0	?	(\$20,000)		
1			\$3,000	
2			\$4,000	
3			\$5,000	
4			\$6,000	
5			\$7,000	\$25,000

N: $5 \times 1 = 5$ I: Unknown

- 2) Transfer the TVM-Grid to a financial calculator and solve for the interest rate per year, I/YR.

N	I/YR	PV	PMT	FV
0	?	(\$20,000)		
1			\$3,000	
2			\$4,000	
3			\$5,000	
4			\$6,000	
5			\$7,000	\$25,000

I/YR = 25.76%