

## REAL ESTATE DECISION MAKING – MODULE 4

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In this example, we're going to analyze a potential investment in an apartment building. Avalon apartments is a 25 unit apartment complex with a purchase price of \$1.6 million. Each of the 25 units rents for \$800 per month, and rents are expected to increase at 3% per year.

We're going to assume a general vacancy allowance of 8% of PGI. Remember that this is a buffer. We're forecasting cash flows, and we really don't know exactly what they're going to be, but 8% represents roughly two units being vacant at any point in time.

We'll also assume operating expenses of 40% of effective gross income, and we'll analyze this property over a five year holding period. When we sell it, we will use a terminal cap rate of 9%, capitalizing year six NOI, and have sales expenses of 5%.

Our goal here is to determine the cap rate, appreciation rate, and IRR. We'll also determine how much an investor would have to offer to get an expected IRR of 10%.

To start this analysis, we would multiply the \$800 monthly rent times the number of units. So \$800 times 25 gives us \$20,000 per month, and multiply that times 12 to give us \$240,000 expected annual rent, or potential gross income of \$240,000.

We then would multiply that number by the 8% vacancy allowance, which is \$19,200. And subtract that from PGI to give us an EGI of \$220,800.

Operating expenses are 40% of that amount, or \$88,320. And we subtract that from EGI to give us net operating income of \$132,480.

Now we could calculate PGI for every year-- it increases at 3% per year-- and vacancy EGI operating expenses all the way down to NOI. But since PGI increases at 3% and all these other numbers are a function of the number above it, essentially NOI is also going to increase at 3% per year. So we can just calculate the cap rate, at this point, by dividing NOI of \$132,480 by the \$1.6 million. That gives us a cap rate of 8.28%.

And then continue expanding NOI at 3% per year out to year five, giving us our annual cash flows for the first five years. We're also going to want to calculate year six NOI-- which is \$153,581-- since that's what we're going to use to determine the sale price.

That number, of course, is not included in our cash flows for the calculation of an IRR, but it is used to calculate the sale price. And dividing year six NOI by 9% gives us a sale price of just over \$1.7 million.

So now we can calculate the appreciation, which is going from \$1.6 million to \$1.7 million over a five year period, I would use the financial calculator. The present value would be the \$1.6 million, future value the \$1.7, and compute [? i, ?] which gives us an appreciation rate of 1.3.

Now, this rate is lower than the growth in NOI because we're selling the property at a higher cap rate. In other words, when we purchased it we were getting 8.28% percent on the money invested. When we sell it, market cap rates have risen to 9%, which means that people expect more for every dollar invested, or are willing to invest less for every dollar of NOI. And that's the reason for the difference in the rent growth rate and the appreciation rate.

Our next step is to calculate sales expenses of 5% of the selling price, \$85,323, and subtract that from the gross sale price to get the net sale price of \$1,621,129. And that gives us the cash flows that we need to calculate IRR.

We basically use the \$1.6 million as cash flow 0, and NOI for each year in year five-- NOI and the net sale price are combined to give us a cash flow of \$1.77 million. And this gives us an IRR of just under 9%, 8.97%.

Note that that's roughly equal to the combination of the cap rate and the appreciation rate. Since the IRR is a total rate of return, cap rate is a current yield, like a dividend yield. And the appreciation rate is the property appreciation from one point to another point.

To calculate the purchase price, or offer price, that an investor would have to offer to get a 10% IRR, we take the same cash flows-- and the easiest way to do this in the financial calculator is to use the NPV function, except setting cash flow 0 equal to zero, and calculating NPV at a 10% discount rate.

And that gives us the present value of \$1,535,858. That offer price would result in an IRR of 10%, given these assumptions.