

REAL ESTATE DECISION MAKING – MODULE 5

Professor: Greg Smersh, Ph.D.

In this example, we're going to go back to Avalon apartments and look at a leveraged example. In the previous example, we calculated the cash flows for an unleveraged IRR. And you might recall that this was a 25 unit apartment complex with a purchase price of \$1.6 million. We had rent of \$800 a month that increased at 3%. The cap rate was 8%, operating expenses were 40%. And we had first year NOI of \$132,480. Which gave us a cap rate of 8.28%.

And we had an unleveraged IRR of 8.97%. Now we're going to finance this property at 75% loan to value using a 30 year fixed rate mortgage at an interest rate of 7%, with financing costs of 2%. And here, we are going to calculate initial equity, the leveraged cash flows for both the annual cash flows and the reversionary cash flow, along with the leveraged IRR.

So here we have the cash flows from the previous example. We started out with potential gross income of \$240,000. First year's NOI of \$132,480. That grew at 3% per year. We calculated out to year six, because we want to capitalize year six NOI to get our sale price of just over \$1.7 million. And again, that gave us an unleveraged IRR of 8.97%.

So when we leverage a property, calculate the cash flows for a leveraged property, the first thing to do is to calculate the mortgage amount, annual payment, and mortgage balance. Remember, there's three parts of the cash flow model-- the initial price, the annual cash flows, and the sale, or reversionary cash flow. And so the mortgage is going to be used in all three of those components of the cash flow model.

First thing is to calculate the mortgage amount. We're told that loan to value is 75%, and 75% of \$1.6 million is \$1.2 million. That's our present value in the calculator. n is 30 times 12, or 360. And i is 7 divided by 12. Future value, of course, is 0, and computing the payment gives us 79.84 per month.

The cash flow model is annual. So we want to calculate annual debt service, and so we multiply this payment amount by 12 to get annual debt service of \$95,804. While we're at it, we might as well calculate the mortgage balance. Because that's a number that we're going to need for the reversionary cash flow. Remember that this is a 30 year mortgage. After five years, it's a 25 year mortgage. 25 times 12 is 300 months have gone by.

So to calculate the mortgage balance, we can simply change n to 300 and compute the payment, which in this case is going to be \$1,129,579. So now we need to apply all three of those numbers. The mortgage amount, the annual debt service, and the mortgage balance, to the cash flow model, to the numbers that we already have from the previous example.

First, let's calculate initial equity. And here, we're going to subtract the mortgage amount from the purchase price. And then we're going to add in the financing costs. Remember financing costs are

2% of the mortgage amount, or \$24,000. And so this totals \$424,000. That is the investors' initial equity.

Next we want to apply the annual debt service of \$95,804. It's the same number for each year, of course. But the before tax cash flows are different for each year. We subtract the \$95,804 from the NOI for each of the five years to get the five before tax cash flows.

So we have initial equity. We have the annual leveraged cash flows. The only thing left is to calculate the before tax equity reversion. And so here, we take the mortgage balance and subtract it from the net sale price, which gives us a before tax equity reversion of \$491,550. Just as with the unleveraged example that is now added to year five's cash flows.

And that gives us the cash flows for all of the years, including cash flow 0. And putting that in the financial calculator gives us a leveraged IRR of 12.81%.