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The Impact Of Cap Rates On Property Valuation.

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Abstract

Here, we have several objectives. The first one is to understand how cap rates and net operating income impact the valuation of the property. To do this, we're going to build an example analysis. Tests of several alternative investments, and then we'll be able to compare them and perform sensitivity analysis to see a range of values for each of these properties. Finally, we'll be able to make an assessment based on that analysis if we think they're overvalued, undervalued, or potentially good or bad investments

1. Introduction

Let's look at the three major steps involved in performing this analysis. The first thing is to take all of our assumptions into account. We need to have assumptions for the property name, the number of units, and the sizes of those units. The gross monthly rent on average And the cap rate for the property (Real estate financial modeling, 2020). Financial modeling and valuation analyst studies Corporate Finance Institute Canada

1.1 Purpose of the Study

The purpose of the study was to evaluate the effects of cap rates and net operating income on the valuation of properties.

2. Literature Review

We're going to have all those assumptions, and then that's going to feed into a piece of analysis, and we can calculate first of all the gross rental income based on those assumptions. Then you've got drivers of expenses, which are those hard-coded items on the left such as a 1.1 percent property tax rate, insurance cost, repairs and maintenance, and then finally an allowance for vacancy and others. Once we know the total expenses, we deduct those from the income and get the net operating income. From the net operating income and the cap rate, we can finally arrive at the top of the spreadsheet with the property value and the value per square foot. Then the third step is to perform a sensitivity analysis where we look at the property value per square foot, which are the numbers in the center of this table, and see how they're impacted by different cap rates and different monthly rental rates. At the end, we'll be able to form a view on the attractiveness of each of these properties. Now let's move over to Excel and get modeling.

Table 1

Assumptions section

Assumptions

Property/Name		**Suburb**	**Midtown**	**Trendy**	**Downtown**	**Ocean**
Average Unit Size (sq ft)		1,500	1,500	1,500	1,500	1,500
Units (#)		5	5	5	5	5
Gross Rents ($/fq ft/month)		$3.00	$3.75	$3.90	$4.70	$5.00
Cap Rate		5.0%	4.7%	3.6%	3.7%	3.0%
Months per Year	12					

Behind that, we've got some assumptions, and we can assume that these property assumptions have come from either a client or a senior member of our team who wants us to perform this analysis. So here are the key property assumptions, and then we've also got some operating expense assumptions below. So we're going to work together now to use the assumptions to dry out our NOI analysis and then ultimately complete the rest of these tables and charts. So let's go to the raw data and get this information about each of the properties. Copy it. And let's paste it here in the assumptions as values so that we leave the formatting that we had in place. Let's go back, and now let's get these operating cost assumptions. Copy those. And

we're going to paste them here. Has values once again. And these numbers will be used to drive the operating expenses of the properties.

3. Methodology

3.1 Determination of Real Estate Property Revenue and Expenses to Calculate Net Operating Income for the Properties and the Property Value:

Now that we've got the assumptions in place, let's start calculating the revenues and expenses. The total rental income is going to be equal to the average size per unit multiplied by the number of units. Multiplied by the average gross rent per square foot per month. And since that's a monthly figure, we also have to multiply it by our assumption here and the number of months per year. And that's a reference that we anchor in place by pressing F4. Now let's recalculate the rent per square foot per month, just to make sure everything's working properly. All we do then is divide that total number by the average unit size, divide again by the number of units, and divide again by the number of months per year. Anchored with that 4, we see three, which is the same as our assumption. So that's perfect. Now let's calculate the average rent per unit per month. To do that, take the total annual number divided by the number of units and then divide by the number of months, which is an anchored reference of four. We will then refer to the total gross rent that we have in row 18. Once again, just so we've got it there for easy reference, we can take all of this and fill it across with Control R, and we've gone and placed now all of the revenue figures.

Table 2

NOI & Valuation

Property Value	**$4,091,803**	**$5,443,966**	**$6,999,574**	**$8,411,368**	**$10,390,244**
$ / SF	***$546***	***$726***	***$933***	***$1,122***	***$1,385***
NOI Calculation					
Rental Income	$270,000	$337,500	$351,000	$423,000	$450,000
$ / SF / Month	*$3.00*	*$3.75*	*$3.90*	*$4.70*	*$5.00*
$ / Unit / Month	*$4,500*	*$5,625*	*$5,850*	*$7,050*	*$7,500*
Total Gross Revenue	**$270,000**	**$337,500**	**$351,000**	**$423,000**	**$450,000**

Now let's start working on the expenses. You pay the property tax. He anchored in place with those four, and we multiplied it by the property value. Notice that we have not counted the property value yet. We're going to get to that at the end, but we can create the formula now. So we're linking to the property value and multiplying it by the annual property tax rate. Now we can calculate the insurance, which is a per-unit assumption. So we take this, anchor it with that four, and multiply it by the number of units. Then we take the repairs and maintenance that are internal and on a per-unit basis once again. So it's anchored with f4 or referenced and multiplied by the number of units. Finally, we bought a fixed-cost assumption for repairs and maintenance. An external cost that's fixed. we simply link to this assumption with a four, and we don't have to multiply it by anything. Then finally, we've got an allowance for vacancies. If you want to make that assumption, anchor it and multiply it by the gross annual revenue. This will give us a buffer for any vacancies that might exist on the property. Let's add up all the expenses with equals. And then let's take this and fill it across to the right. So now we've got all of our revenues in place and all of our expenses

.

Table 3

Expenses:						
Property Tax	1.10%	$45,010	$59,884	$76,995	$92,525	$114,293
Insurance (per unit)	$1,000.00	$5,000	$5,000	$5,000	$5,000	$5,000
R & M - Int (per unit)	$500.00	$2,500	$2,500	$2,500	$2,500	$2,500
R & M - Ext	$7,500.00	$7,500	$7,500	$7,500	$7,500	$7,500
Allowance (Vacancy, other)	2.00%	$5,400	$6,750	$7,020	$8,460	$9,000
Total Expenses		**$65,410**	**$81,634**	**$99,015**	**$115,985**	**$138,293**
$ / SF / Month		*$0.73*	*$0.91*	*$1.10*	*$1.29*	*$1.54*
$ / Unit / Month		*$1,090*	*$1,361*	*$1,650*	*$1,933*	*$2,305*
TOTAL NOI		**$204,590**	**$255,866**	**$251,985**	**$307,015**	**$311,707**
$ / Sq ft / Month		*$2.27*	*$2.84*	*$2.80*	*$3.41*	*$3.46*
$ / Unit / Month		*$3,410*	*$4,264*	*$4,200*	*$5,117*	*$5,195*

Now we will determine the total net operating income For each of these properties, which will then allow us to arrive at the property value. So before doing that, let's just calculate the expenses per square foot, per month, and per unit per month. All we have to do for that is divide it by The number of square feet divided by the number of units and then divide by the monthly assumption. So we got $0.23 per foot per month. And then we can take the same total expenses number divided by the number of units divided by the number of months in a year, and we get $340 per unit per month. Plus, select those expenses and fill them right with control R. So now, to calculate the total net operating income, we take the gross revenue and subtract the expenses. And then we can calculate it per square foot per month. So once again, we take it and divide it by the average square foot divided by units. Divided by months per year. $2.77 per square foot per month. Let's do it again on a per-unit, per-month basis, provided by a number of units. Divided by the number of months, each of the units in this building generates $4160 per month in net operating income. Let's fill that all across. You can now see what each of these properties generates. Based on that information, we can calculate the property value.

Table 4

NOI & Valuation

Property Value	**$4,091,803**	**$5,443,966**	**$6,999,574**	**$8,411,368**	**$10,390,244**
$ / SF	***$546***	***$726***	***$933***	***$1,122***	***$1,385***

The property value is going to be equal to net operating income. Divided by the cap rate assumption for each property, and when we press enter, we're told that we get a circular reference. But that's fine for now; we know there's a circular reference because of the tax assumption. The annual taxes are dependent on the property value, and the net operating income is dependent on the taxes, which drive the property value. So you see how we have this circular reference, but that's fine. We can solve this with Excel if we go to our options, go to formula settings, and enable Iterative calculation and press OK. We now get Excel to solve this, and then we have the property value calculated. Now let's take our property value and divide it by the square feet. Divided by the number of units, we get the actual property value per square foot. You can take this copy. And then paste Special as formulas so that we preserve the special formatting equipment in place with the border around here. We pasted in its formulas to fill that all in. And now we can see these property values and, on a square foot basis, what they look like. And you can see how there's clearly a huge premium. For the ocean property here in terms of valuation per square foot, of course it's got the lowest cap rate, and then over here you've got the highest cap rate with the lowest value for the property.

Now that we've set up the foundation of our model, which is all of these formulas here, let's perform some sensitivity analysis to see a range of values for properties. For the suburb property, for example, we've arrived at a per-square-foot value of $546. That's a very precise number. And there are a lot of assumptions here that we really can't be totally certain about. So we need to perform sensitivity analysis to see how these assumptions change what's going to happen to this first square foot valuation because there should be a range here, not just a single number. We don't know exactly what the gross rent is going to be, for example.

4.Data Analysis And Results

Sensitivity analysis

Table 5

Sensitivity Analysis - Property Value ($/sq ft) – Suburb

Cap Rate	**Gross Monthly Rent ($/sq ft)**						
	$2.50	$2.75	$3.00	$3.25	$3.50	$3.75	$4.00
5.0%	$449	$497	$546	$594	$642	$690	$738
4.5%	$489	$542	$594	$647	$699	$752	$804
4.0%	$537	$595	$653	$710	$768	$825	$883
3.5%	$596	$660	$723	$787	$851	$915	$979
3.0%	$668	$740	$812	$883	$955	$1,027	$1,099
2.5%	$761	$843	$924	$1,006	$1,088	$1,169	$1,251
2.0%	$884	$979	$1,074	$1,168	$1,263	$1,358	$1,453

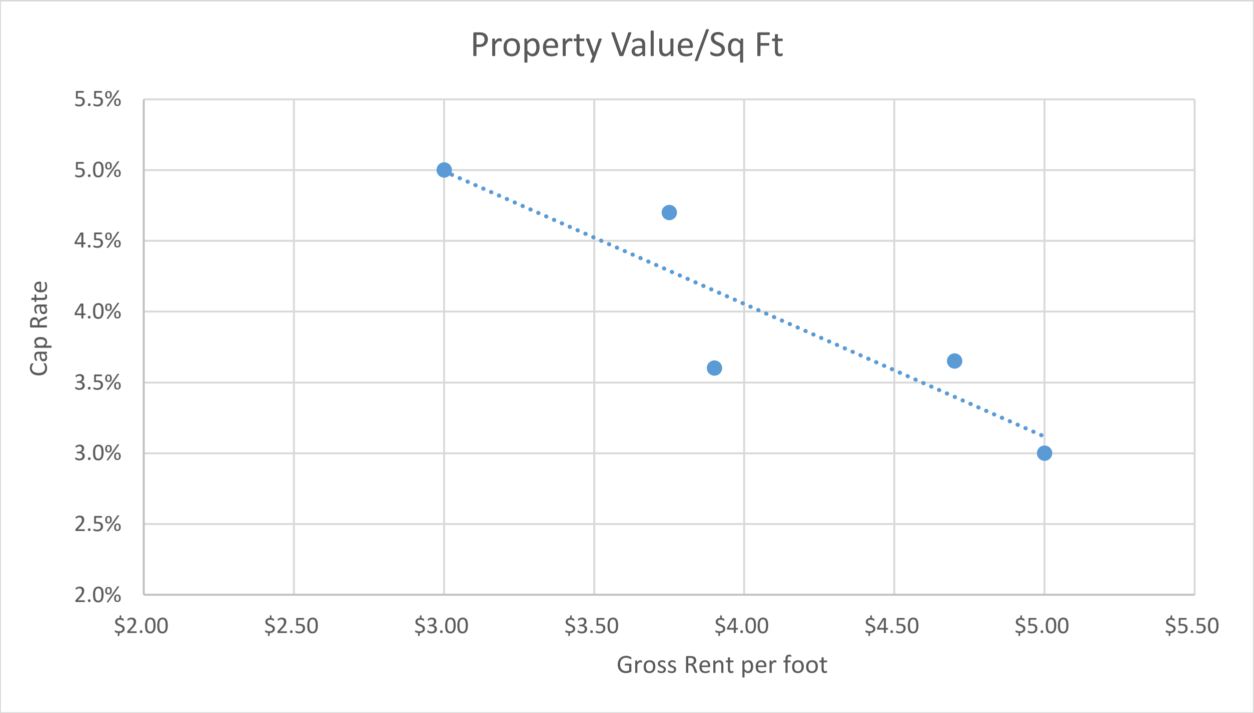
So to do that for the suburban property, let's link to the property value per square foot. We've formatted this to be a white font color because we don't want to actually see the number here, but we need it for linking purposes. Then let's enter some gross monthly rent assumptions right here. Let's say we think that on the low end, in the worst-case scenario, it's going to get $2.50 a foot. And let's add to that in 25-cent increments and fill it across so that, in a best-case scenario, we think the property could get $4 a foot in gross monthly rent. So now we've got a range. Instead of just saying it's going to be $3, we bought a range here with the downside and the upside. Now let's look at the cap rates. We initially assumed a 5% cap rate. So let's say here that we think the worst-case scenario is a 6% cap rate. Then let's decrease that in half of the percentage increments. So now there's about 5 1/2%, and you can fill that all the way down to 3%. That's for deuce, the number of decimals. We just have one. So now here's our range. Worst case 6% cap rate Best case: 3% cap rate. Let's select the entire table and press the Alt AWT shortcut to perform the What If analysis and build a data table. We can link to the row assumption. It's asking us where to put this assumption. Where I should have put this row across the top, here are two: $0.50. Well, it should put that assumption right here. That's the suburb's gross monthly rent. Then it's asking for the column where we should put this column assumption that's going to be running, and it should put that. Assumption right here. That's our cap rate. Let's press OK. And now we can see a range of values per square foot for this property. And you'll notice that this in the top left corner is our worst-case scenario. The lowest rent and the highest cap rate are only worth 386 feet, and our best-case scenario is over 1000 feet. Most likely, this is the middle range here. That's probably where we might want to say we really have a high degree of conviction of it being between 546 and 768 feet. So we perform a sensitivity analysis just for this other property. We would repeat this process for all of the properties.

Recommendation and Conclusion

Now let's create a chart to summarize our analysis.

Figure 1

Cap Rate vs Gross Monthly Rent



If we believe that two of the most important assumptions are the gross rent and the cap rate, we want to include both of those in a scatter plot chart. So let's go to Insert Recommended Charts and All Charts. We're going to choose a scattered plot chart. Value by looking at the rent per square foot and the cap rate for the property, with the top right quadrant being the preferred place to buy a property and the bottom left quadrant being a worse place for buying property. To conclude, cap rates have a significant effect on property values.

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