

Cap Rate: Please Explain!

Everyone in real estate thinks they understand what is meant by a “cap rate.” Yet if asked to define exactly how it is calculated, you are likely to get different answers. It isn’t so bad that the definitions are different, but there is enough of a difference that the actual definition of what the user is talking about matters. A user can get two very different cap rate numbers using two different definitions, and both may be correct!

Everyone will say that a cap rate is simply the ratio of NOI to value. But if pressed for detail the first question is what NOI? Last year’s actual NOI? Next year’s projected NOI? Is it based on existing leases or assuming the property is leased at market rents?

NCREIF members report the actual NOI on properties that are in the NCREIF Property Index (NPI). But NCREIF does not currently collect data on what the appraiser projected for next year’s NOI on the properties. Thus, the NCREIF cap rates are based on historical accounting NOI.

The second question is what value? If the property was not sold during the quarter, the value used in the denominator of the cap rate calculation is the value reported by the member for the NPI. If the property was sold, then the actual transaction price is used.

So now we kind of know what NOI and what value. But what we have described so far is just the beginning. The NCREIF query tool allows you to obtain cap rate trends that are aggregated across some or all of the properties in the NPI, e.g., for all office properties or for apartments in the East. So the next question is exactly how this average is calculated and how is the historic NOI used, e.g., just the most recent quarter or for the last four quarters? As it turns out, the query tool allows you to do it both ways!

The NCREIF query tool has six different definitions that can be queried. You may want to take a moment to pause here. I was stunned by that fact too. We will take the reader slowly through the explanations. This shouldn’t overwhelm you. Should you feel yourself getting dizzy, take a deep breath and pause before continuing. 😊

Since this topic can be complex and involve a lot of technical jargon, this paper only looks at the different definitions and a little bit of data. Future Research Corners will dig deeper into the data and provide more analysis. The purpose of this paper is to introduce the reader to cap rates and explain the different definitions.

Which of the six cap rates you want to use depends on your needs. All of them are available in the query tool; you need to pick the query that suits you best. NCREIF has value-weighted (market-weighted) and equal-weighted appraisal and transaction cap rates. Equal-weighted appraisal cap rates are calculated by taking the current quarter NOI and dividing it by current quarter market value then multiplying by four or by summing the previous four quarters of NOI and dividing that by the current quarter market value. To make it market-weighted, the individual property results are weighted by the market value of the properties.

The transaction cap rate uses the previous quarter's NOI rather than current quarter, since the NOI of the transaction quarter is not a full quarter's worth of data. Similar to the appraisal cap rates, either the result is multiplied by four to get a full year's worth of income or four quarters of lagged NOI is used.

When NCREIF does these calculations for you, they have filters that remove some of the outliers. Since accounting data is being used, sometimes the NOI data is noisy. Those observations are discarded from the calculation. Any cap rate less than -30% or greater than 30% for the appraisal data and less than 2% or greater than 14% for the transaction data is not included. Negative NOI is an unusual concept and a true cap rate cannot be negative, but given the use of accounting data these type results will occasional happen in a quarter.

The data is averaged over a large number of properties, and we don't want to create an upward bias by eliminating the negative numbers and keeping the large positive results. The law of large numbers allows us to keep all the results within the band knowing that the negative data is a temporary phenomenon for the quarter and would be corrected over a longer time period.

At the national level, there are enough observations that the noise is damped by the large number of observations. As users of the data drill down to smaller geographic units, they will notice more fluctuations in the results since there is less data available. One way to correct for this is to use a four quarter moving average of the regional, divisional or metro cap rates. Doing this smoothes the results, which helps eliminate random noise but may dampen trends.

Using trailing four quarters of NOI data avoids some of the noise (and negative results) in the NOI quarterly data but also takes data that is almost a year old. As the reader will see below, cap rates are traditionally forward looking, so going back a year may not accurately reflect the market - especially when fundamentals are moving quickly!

So why equal and value weighted results? NCREIF does equal weighted because that is the best way statistically if you are generalizing to a broader population, which is what the NCREIF data represents. Value weighting may be more representative of a portfolio, which is how a user may think about their assets.

It is important to remember the limitations of cap rates since they are just one piece of data in a complex world. I am going to borrow an example from a friend of mine. Her company bought two identical office buildings in a suburban office park. The buildings were completed a year apart, but were otherwise identical. When her company bought them they paid a 12% cap for one building and a 2% cap for the other.

The blended cap rate of 7% makes sense, but each building was very different. The first building delivered full at the peak of the market. Therefore when the existing leases were done, rents were likely to roll down and occupancy was likely to drop. Therefore, that building had a higher cap rate. The second building was finished during a recession and was never fully occupied. In addition, the rents were below market and likely to increase when the new leases were signed. Thus, they paid a low cap rate knowing that income would increase. This is a bit of an extreme example, but shows the danger of

looking at just the cap rate. It is important to understand the factors that are driving the cap rate. Someone without knowledge of the situation may think the 12% cap rate was a steal and the 2% cap rate was overpriced.

Looking at data without putting the data in context can be dangerous. Having a large number of data points lowers the weighting of each individual piece of data and removes the noise that may occur from a single idiosyncratic piece of data. Cap rates are a good point of reference and useful to use, but they should be taken in context with other data.

The NCREIF definitions are a bit unusual since they look at only trailing income rather than future income. Let's look at the definitions from some other data providers.

Real Capital Analytics (RCA) uses a stabilized cap rate based on occupancy greater than 85% for consistency purposes. Their cap rates are mostly based on forward looking, pro-forma numbers, but they do use in place, quoted and prior year data when appropriate.

Cap Rate: The initial annual un-leveraged return on an acquisition (also known as the net initial yield). A cap rate measures the ratio between the net operating income produced by a property and its capital cost (the original price paid to buy the asset).

For example, a property's capitalization rate is ten percent if it is purchased for \$10 million and produces \$1 million in net operating income during one year.

CB Richard Ellis Investment Sales and Valuation groups survey clients on a quarterly basis to determine cap rates in the market. They have two different definitions depending on property type.

Cap Rates (Office, Industrial, Retail, and Hotel)

Stabilized cap rates were based on in-place NOI for the latest year before adjusted for reserves. Value-add cap rates were based on projected stabilized NOI.

Cap Rates (Multi-housing only)

Cap rate ranges are based on an estimated NOI derived by annualizing the last 90-days of revenue and subtracting what buyers would estimate as stabilized, year one expenses after adjustments for real estate taxes and reserves.

Caprate.net has a simple definition with a number of exclusions.

$$\frac{\text{Year 1 NOI}}{\text{PRICE}} = \text{Cap Rate}$$

A Cap Rate is simply the rate of *Year 1 Expected Net Operating Income / Price*. Future expectations - beyond Year 1 - are not mathematically involved in the intentionally simple Cap Rate math.

The Cap Rate formula excludes these relevant items:

- 1) Changes in cash flows after Year 1
- 2) "Below NOI expenses":
 - 1) Tenant improvement costs (those not paid by tenant)
 - 2) Leasing commissions
 - 3) Capital expenses (major repairs of roof, HVAC, parking lot, structure, etc.)
- 3) Loan expenses
- 4) Reversion Price (property sale price at end of holding period)

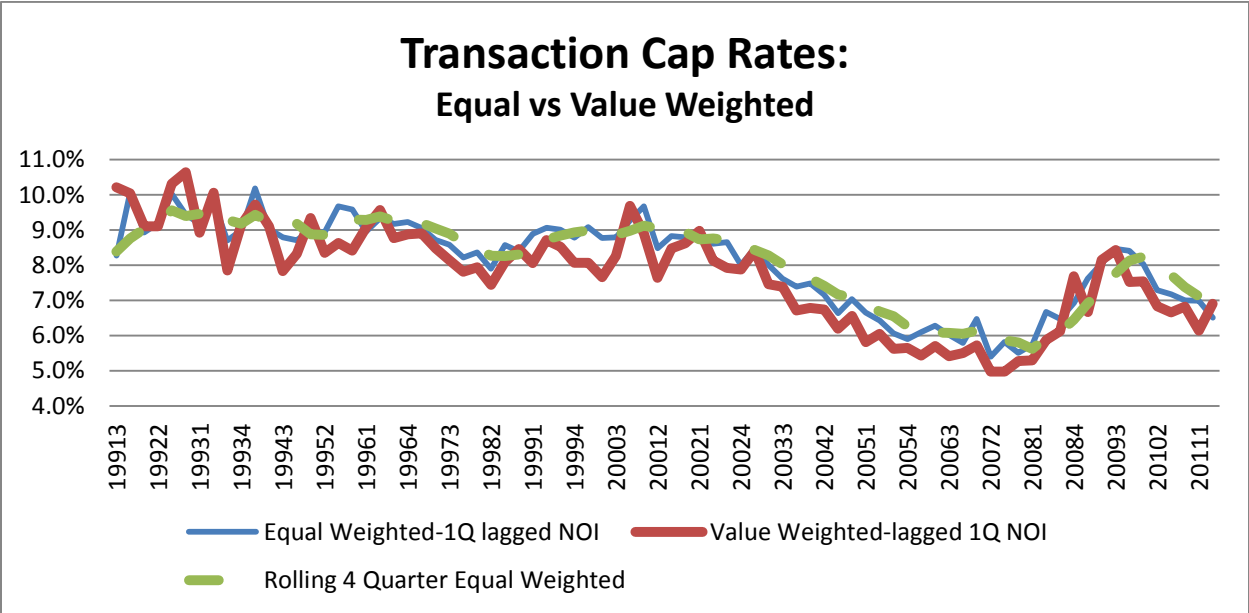
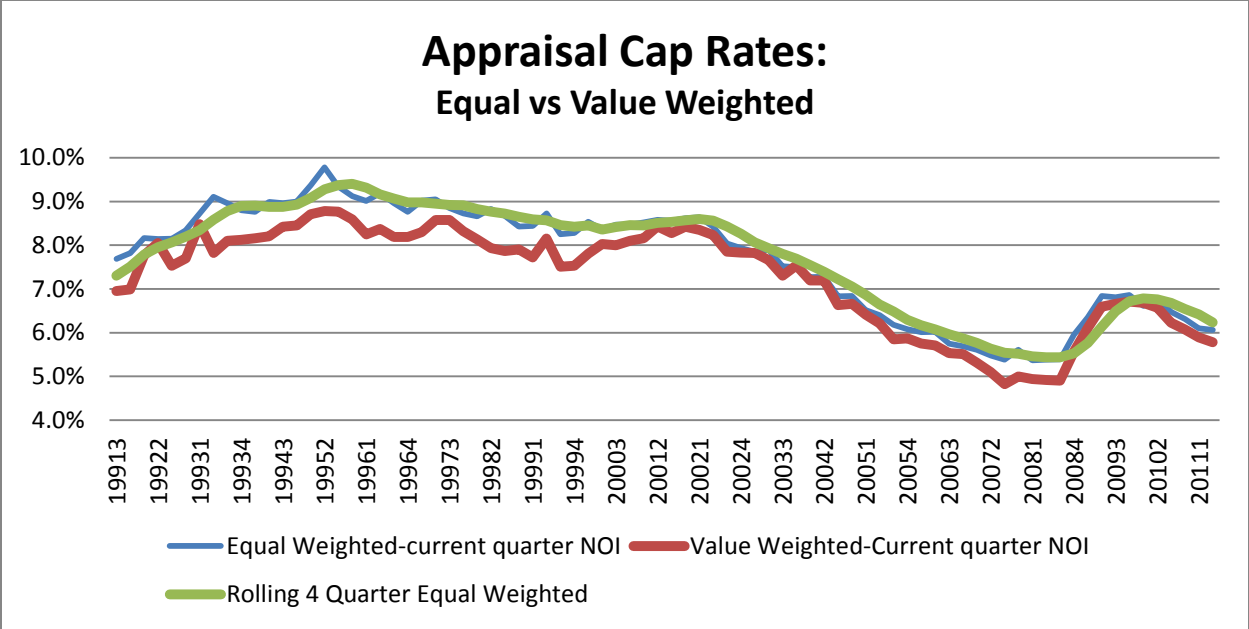
One other important point to remember when looking at cap rates is that this number is different than a yield. Yield accounts for all the expenses that are not included in the NOI such as capital expenditures, tenant improvement costs, etc. So the income used in yield is lower and therefore the yield itself is lower than the cap rate.

Data

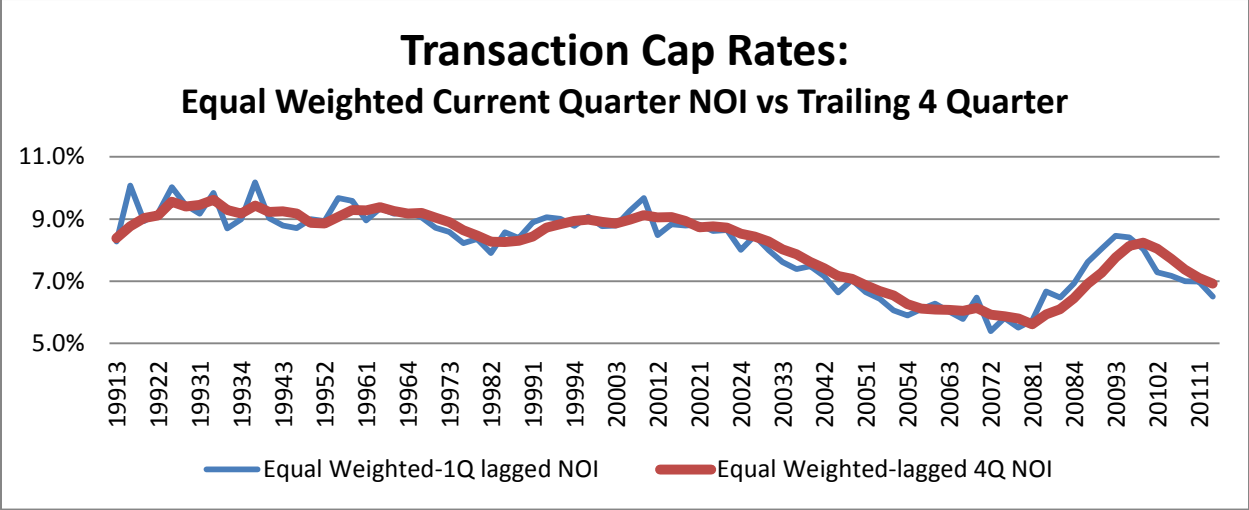
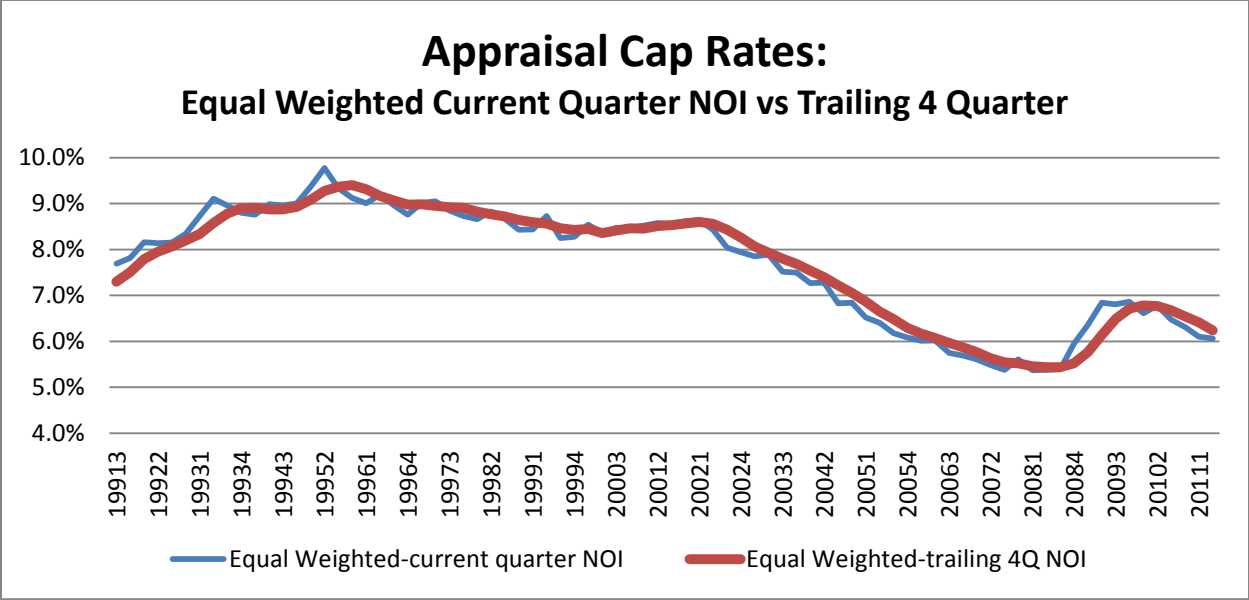
The next part of the paper looks at the various cap rates in graph form. These charts show the similarities and the differences. The reader will notice that the trend lines are the same with more noise in some relative to others. In addition, the value-weighted numbers are usually slightly lower than the equal-weighted.

The first graph compares appraisal cap rates of an equal and value weighted series. For most of the series, the value-weighted cap rate is lower. This is to be expected as larger buildings in big metros traditionally have a lower cap rate. The average difference over the twenty year period shown on the chart is 0.4% or 40 basis points. The gap has narrowed recently compared to the 1990s and the mid-2000s. There appears to be some cyclical to the gap depending on where CRE is in the cycle. The dashed green line shows the equal weighted series using a four quarter moving average. As expected that series has a lower volatility than the single quarter NOI times four.

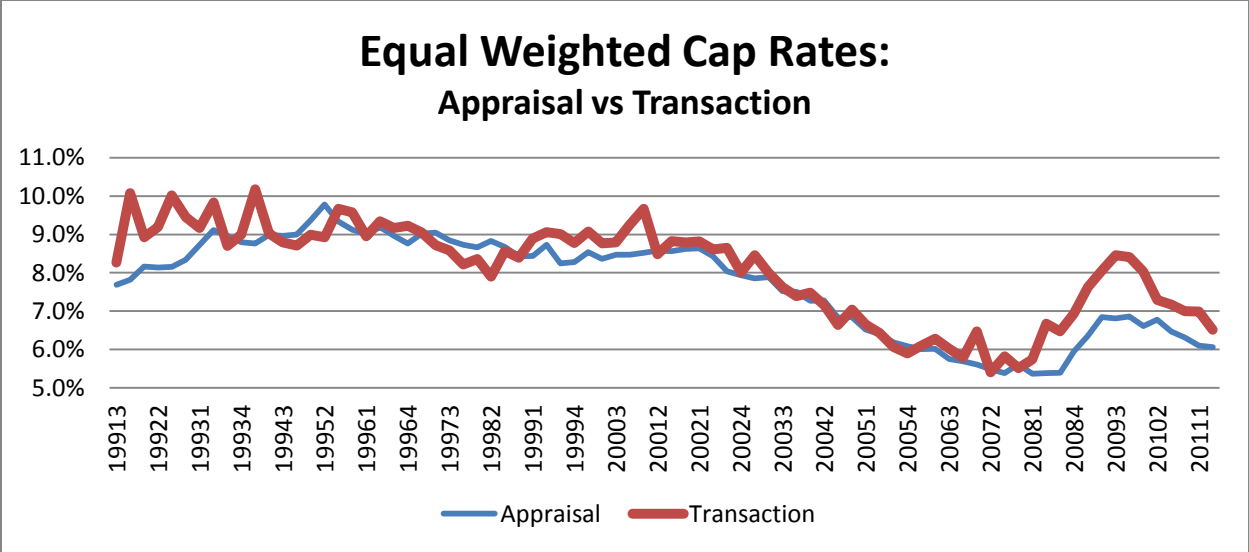
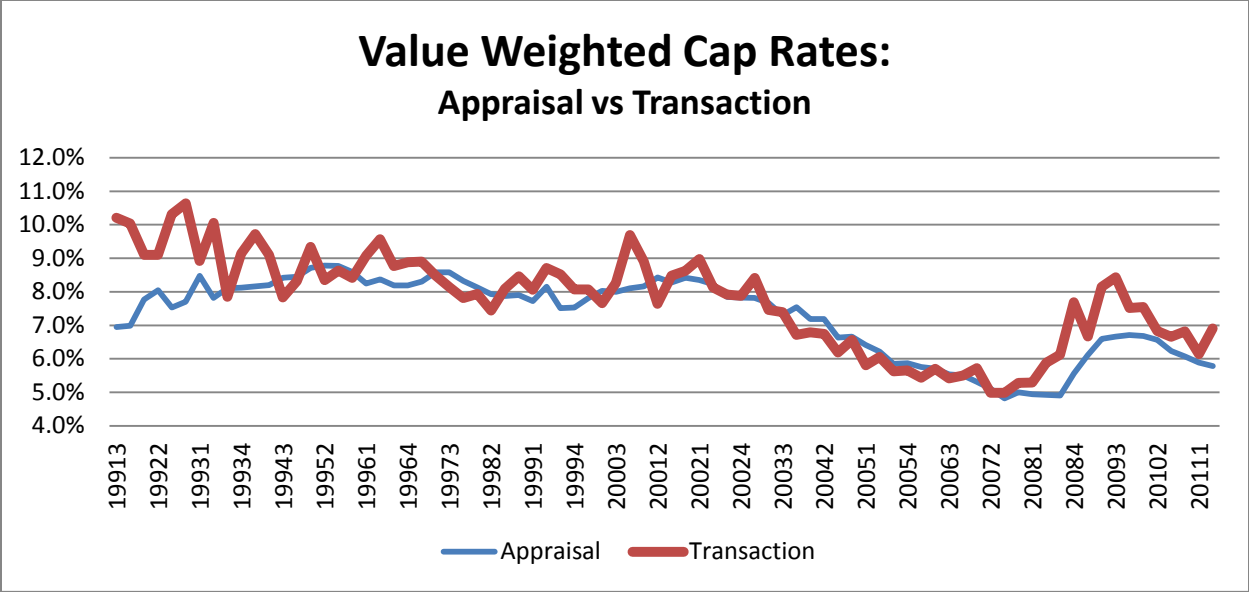
The second chart compares the equal and value weighted transaction series. The results are similar to the appraisal cap rates except there is more volatility in these two series.



The next two graphs compare the current quarter NOI with the four quarter lagged NOI. The four quarter NOI standard deviation is lower by several basis points for both types of cap rates, but otherwise the two graphs are similar. As expected, the two series in each chart track one another. They track closely due to the large number of observations and the filters. At a metro or division level, the gaps between the lines would be greater.



The final set of charts compare the appraisal cap rates with the transaction cap rates on the equal and value weighted series. In both cases the appraisal cap rates are 40 basis points lower than the transaction cap rates. The value-weighted appraisal series has the lowest standard deviation of all the series.



As was stated in the opening, cap rates can be defined in a variety of different ways. They are all correct, but the query results will give you slightly different answers depending on what series you are using. Once a user understands the data inputs, they can better grasp what the difference between the cap rate series are. If we added some forward looking cap rates from other data sources, the trend lines would be similar, but the levels would differ.