Direct Capitalization Versus Discounted Cash Flow Analysis

By Wayne E. Etter

Instructor's Notebook presents a lecture on a basic real estate subject. Written by an expert, Instructor's Notebook takes readers into the classroom to hear the professor's talk. This regular feature is designed as an introductory lecture on a different topic each issue.

Many commercial property market brokers, lenders and owners use real estate appraisals having an income approach value estimate derived from direct capitalization and discounted cash flow (DCF) analyses. The differences between these methods and their appropriate use are the focus of this “Instructor's Notebook.”

To estimate value with direct capitalization, a property's stabilized net operating income (NOI) is divided by the market capitalization rate (Figure 1). Estimating value with DCF analysis requires estimates of each year's NOI along with the property's expected reversion value at the end of the analysis period. Usually the analyst uses income capitalization to estimate the reversion. These expected cash benefits are then discounted at the appropriate rate to obtain the market value estimate, also shown in Figure 1.

Estimating Net Operating Income

Although these calculations are simple and straightforward, they depend on the appraiser's assumptions or estimates. When using direct capitalization, the property’s stabilized NOI must be estimated. This estimate is developed from market data (rental rates, vacancy and collection loss rates and operating expense data) for comparable properties in the market area; it represents the appraiser's opinion of how the property ought to perform.

Because the appraiser's opinion is based on observed market data, it’s difficult to quibble with his or her NOI estimate. When a market is “normal,” the notion of stabilized NOI is particularly useful.

But two areas are of special concern. First, what if the property has significant vacancy at the time of the appraisal? Obviously, no one develops a property with the expectation of significant, permanent vacancy. So, the appraiser may use a market vacancy rate (or the anticipated vacancy rate when the property is fully leased) rather than the property's actual vacancy rate. This results in a larger NOI for the subject property and may overstate the property's value. Second, if the property's future NOI is expected to increase because of greater demand for space that leads to higher rental rates, direct capitalization of a single year's NOI may understate the property's value.

Because DCF analysis permits annual adjustments in rental rates, vacancy and collection loss rates and operating expenses, DCF analysis can be used to reflect a buyer's expectations of increasing NOI over time. When a property is expected to become fully leased during the next three to five years, for example, the current vacancy rate can be reduced until the desired occupancy is reached.

This specification of expected changes results in realistic NOI estimates throughout the period—a result far superior to capitalizing a single year's NOI. On the other hand, just assuming that the vacancy rate will be reduced during the three-year period may lead to overestimating NOI.

DCF analysis is ideally suited for situations such as this. However, DCF analysis does not add much useful information when the subject property is fully leased and no changes in occupancy or the external environment are anticipated that will affect NOI. As shown in Figure 1, the present value of a series of equal annual cash flows is equivalent to the capitalized value.

<table>
<thead>
<tr>
<th>Year</th>
<th>NOI</th>
<th>Reversion</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$10,000</td>
<td>$10,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>2</td>
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</tr>
<tr>
<td>5</td>
<td>10,000</td>
<td>$100,000</td>
<td>$110,000</td>
</tr>
</tbody>
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Present value at 10% = $100,000

Source: Real Estate Center at Texas A&M University
Expected cash flow.

The required rate of return ought to be used to discount the analysis is used for investment analysis, the investor's DCF analysis and for direct capitalization. (When DCF the need for appropriate comparables is the same for market using the data of comparable properties. Thus, value, the discount rate ought to be extracted from the DCF analysis is used to estimate a property's market to convert the NOI estimates to a value estimate. When produce a market value estimate that reflects these expectations. A DCF analysis requires careful consideration prospects. It is not an error to use DCF analysis to value a property when no significant change in NOI is expected. However, appraisal report users should understand that this technique's results are no better than those produced by a correct application of direct capitalization. Of course, if both techniques, properly used, achieve similar values, the estimated value has greater credibility. Selecting Capitalization and Discount Rates

Theoretically, concerns about capitalizing a single year's NOI are eliminated by the appraiser's skill in deriving the market capitalization rate from comparable sales. If the market capitalization rate is derived from sales of properties with vacancy rates comparable to the subject and with comparable buyer expectations about becoming fully leased (or for increased NOI), the subject property's value could be estimated with an unadjusted NOI and the market capitalization rate.

Buyers who expect their properties' occupancy levels to improve pay prices that reflect this expectation. Likewise, buyers who expect the future NOI of their properties to increase pay prices reflecting that expectation. In both cases, expectations are reflected by observed capitalization rates.

The appraiser's problem arises when appropriate comparables cannot be located. In this case, the appraiser must develop the capitalization rate and estimate the NOI from the best available comparables to produce a market value estimate that reflects these expectations.

For DCF analysis, an appropriate discount rate is used to convert the NOI estimates to a value estimate. When DCF analysis is used to estimate a property's market value, the discount rate ought to be extracted from the market using the data of comparable properties. Thus, the need for appropriate comparables is the same for DCF analysis and for direct capitalization. (When DCF analysis is used for investment analysis, the investor's required rate of return ought to be used to discount the expected cash flow.)

Deriving a discount rate from the market is more difficult than estimating the market capitalization rate. For each comparable property used in the derivation, the buyer's expectations about future NOI and reversion would have to be determined. This would allow calculation of the discount rate that equates these expectations to the purchase price. (Estimating the market capitalization rate requires only each comparable property's NOI and the reported sales price.)

After obtaining the discount rate for each comparable property, the analyst would select the appropriate discount rate for the subject property. The process is the same as choosing the appropriate capitalization rate from comparable sales.

While this procedure is possible, it would be difficult in practice. Therefore, the discount rate often is estimated by adding a risk premium and a liquidity premium to a relatively risk-free rate of return, such as the U.S. Treasury bill rate or to the yield of some other security. This built-up rate is used to discount the expected cash flows. Although a theoretically correct approach, its use requires a serious attempt to ascertain the risk and return differences between the subject property and the security.

Investor surveys offer another approach for selecting an appropriate discount rate. Such surveys report investors' expectations for several different property types. The obvious problem with their use is that they report general expectations rather than the expectations for a specific property in a specific market.

Sometimes several different discount rates are tried; the rate that results in a market value estimate approximately the same as that obtained with direct capitalization is selected. Then, the reasonableness of this rate of return is verified by comparing it to investor returns in other markets.

Normally, the discount rate is greater than the capitalization rate. Why? As reported in Figure 1, if no change in cash flows is anticipated, the discount rate is equal to the capitalization rate. However, as Figure 2 shows, an increasing income stream requires that the discount rate be greater than the capitalization rate if the two separately determined values are to be equal. (They must be equal because the property can not have two values.) Therefore, because forecasts of increasing income are common, the discount rate used is normally greater than the discount rate. In fact, in a perfect world, the discount rate is equal to the capitalization rate plus the weighted average of the net operating income and the property value annual growth rates.

Choice Difficult, Necessary

Direct capitalization and DCF analysis are each appropriate in certain circumstances. In particular, direct capitalization is well suited for properties expected to have stable NOI; DCF analysis is well suited for properties expected to have fluctuating NOI. Selecting the appropriate capitalization rate and discount rate may sometimes be difficult for both techniques.

A prime benefit of DCF analysis is that in gathering the data required to estimate NOI for the analysis period, a good deal is learned about the subject property's prospects. A DCF analysis requires careful consideration.
of expected supply and demand for a particular type of space and operating expenses. Properly done, such an analysis can provide much information not apparent through direct capitalization.

Often, however, the primary use of DCF analysis is the confirmation of the direct capitalization market value estimate. Despite the fact that for some properties the NOI estimates used in DCF analysis may be more accurate, independent confirmation of the direct capitalization market value estimate requires an appropriate discount rate. Merely using a discount rate that seems reasonable to get a value estimate with DCF analysis approximately equal to the value estimate obtained with direct capitalization is not a confirmation.

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