A Transparent Two-Step Categorization of Valuation Methods

by Hans Lind, PhD, and Bo Nordlund, PhD

ABSTRACT

Valuation methods are usually divided into the sales comparison, income capitalization, and cost approaches. A problem with this categorization is that direct capitalization methods often are classified as part of the income approach while at the same time they can be based on comparable sales. This article proposes a new categorization, where the starting point is the two ways methods can be connected to the market—either through comparable sales or through knowledge about actors in the market. For each of these methods, the strategic variable used can be price, income, or cost. In the second step, adjustments are made; four different methods for doing this are discussed in this article. The article also clarifies where the discounted cash flow method fits into these categorizations.

P roperty valuation methods for determining market value are usually categorized into three broad approaches: the sales comparison approach, income capitalization approach, and cost approach.[1] This article discusses some problems with this categorization and presents a modified categorization to describe in a more transparent way what valuers actually are doing in their analyses.

The main purpose of the article can be described as "unpacking" the distinctions previously made by Lusht[2] between "prediction" of market values based on direct evidence and "estimation" of values by simulating the process of price determination and how different valuation methods interact during the valuation process. Lusht states, "Prediction implies a more objective justification. Estimation is relatively subjective, based more on opinion, and implies less precision."[3] From a broader perspective, being able to clearly describe how market values are arrived at by the valuer is important for the reputation of the profession. Transparency about the meaning and role of different methods also make it easier for the user to evaluate to what degree the valuation is a "prediction" and to what degree it is an "estimation."[4]

A secondary purpose with this article is to clarify what really is done when a property is valued with the discounted cash flow method. Such a clarification is especially important in light of reports that the use of the discounted cash flow method varies significantly between countries.[5] Sweden is one country where most appraisers say that they are using the discounted cash flow method,[6] but it has been argued that the method is easy to manipulate, the results are very

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1. Appraisal Institute, *The Appraisal of Real Estate*, 14th ed. (Chicago: Appraisal Institute, 2013).

2. Kenneth M. Lusht, "Data, the Appraisal Process, and the Market Value Definition," *The Appraisal Journal* 49, no. 4 (October 1981): 534–546. Kenneth M. Lusht, "Most Probable Selling Price," *The Appraisal Journal* 51, no. 3 (July 1983): 346–354.

3. Lusht, "Data, the Appraisal Process, and the Market Value Definition," 539.

4. The Lusht articles referred to are more focused on the value concept, while this article is more focused on applied methods and a transparent description by the appraiser of what really has been done in the appraisal process.

5. See for example, Clare McParland, Alastair Adair, and Stanley McGreal, "Valuation Standards: A Comparison of Four European Countries," *Journal of Property Investment and Finance* 20, no. 2 (2002): 127–141,

6. Lina Bellman, *Auktoriserade fastighetsvärderares syn på värdering: tankemönster om kommersiella fastigheter* [*Certified property valuers approach to valuation: cognitive structures of commercial properties*], Mid-Sweden University, Sundsvall 2012, http://miun.diva-portal.org/smash/get/diva2:567065/FULLTEXT01.pdf.

sensitive to specific assumptions, and the method has an unclear relation to market activities.

The structure of the article is as follows. First, the problem related to categorization is described. Then, the basic proposed framework is presented followed by presentation of systematized methods for making adjustments for differences. Next, a special section is devoted to discussion of the underlying premises of discounted cash flow (DCF) analysis. Finally, conclusions and limitations are presented.

Problem Description

The starting point for this discussion is the issue of how to draw the line between the sales comparison approach and the income capitalization approach. Assume an appraiser is looking for the market value of commercial Property A, and recently a number of similar properties have been sold. Data about prices and characteristics of these properties are available, for example, the number of square feet and the net operating income. Suppose first that there is a stable relation between the price paid and the area of these comparable properties and that this relation is used for valuing Property A by multiplying the area of Property A by the observed price paid per square foot. This would without a doubt be seen as an example of using the sales comparison approach.

Now, suppose instead that there is not a stable relation between area and price, but a stable relation is found between the observed price and the net operating income for the transacted properties. The initial income return (or direct yield or all-risk yield) turns out to be the same in all the transactions carried out. Instead of using price per square foot, the valuer now uses the observed initial income return to determine the value of Property A, where the net operating income is known. The value is simply determined by dividing the net operating income by the observed income return from the transactions. In the literature, this is typically called using (a version of) the income capitalization approach. The value is reached by direct capitalization of the net operating income using data from comparable sales to find the capitalization rate.

It is hard to see any fundamental difference between the two procedures described to value Property A. In both cases, the starting point is an observed relation derived from recent transactions, either using the area or the net operating income as a normalizing factor. The conclusion could then be that both methods used should be classified as a sales comparison approach and that there is no room for an income approach.[7]

It is often emphasized that if the cost approach is used it is important to find market evidence about the relation between a cost and a value.[8] Are the actors on the market willing to pay more for a property with higher quality that costs more to produce? Assume that a stable relation can be found in a set of market transactions between the (replacement) cost of a building and the market values; if so, shouldn't this also be seen as a version of a sales comparison approach and not as a specific alternative approach, i.e., the cost approach. In this approach, as with the others, the base for the conclusion is an observed relation between a specific variable (replacement cost) and the price paid in recent transactions.

Categorization of Basic Methods

Valuations are often done in several steps. It is argued here that the method used in the first basic step should be distinguished from the methods used subsequently in making adjustments for remaining differences in characteristics. In the first step, two aspects are considered in categorizing the valuation method:

• What are the *strategic variables* used—price, income, or cost?

• What information is used to make the *connection to the market*—primarily observed transactions or primarily knowledge about the actors in the market?

In the traditional approaches, the strategic variables can be described as follows:

• Price, where a direct link is made between price in the market and a hypothetical price for the property that is to be valued; this variable uses very similar transacted properties or through normalization a physical measure like area.

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7. As pointed out by one reviewer, there are examples of valuations where the capitalization of the net operating income is presented as a sales comparison approach, together with using the gross income multiplier, but this only illustrates the kind of confusion that should be avoided. The methods should be presented as a version of the sales comparison approach and nothing else.

8. See for example, Sven Bienert et al., *Methodologies for Integration of Energy Performance and Life-Cycle Costing Indicators into Property Valuation Practice* (Working Paper No. D7.2, 2011); http://immovalue.e-sieben.at/pdf/immvalue_wp7_report_d7.2.pdf.

- Income, where a link between some income variable is used in the valuation, for example, net operating income or gross rent and prices on the market.
- Cost, where a link between cost and prices is used in the valuation.

Further, the connection to the market can be described in two basic ways:

- Through *observed transactions* or a sales comparison approach. (A more correct name could be a "sales analysis method," but the traditional name is used here to avoid confusion.)
- Through knowledge about the actors on the market. Many real estate markets are thin and heterogeneous; the appraiser can then primarily use knowledge of "how the actors think" to connect the information about the characteristics of the property to the estimated market value. In the present discussion, this will be called an *actor-based approach*.[9]

If these two dimensions—strategic variables and connection to the market—are paired, a matrix with six different valuation methods is arrived at, as shown in Table 1. Of course, in a specific case a combination of these methods can be used.

Note that categorization of the two types of connections to the market—sales comparison and actor-based—can be seen as a simplified version of the fair value hierarchy proposed in International Financial Reporting Standard (IFRS) 13, *Fair Value Measurement*.[10] The hierarchy of inputs in IFRS 13 includes Level 1 inputs consisting of quoted prices for identical assets, unadjusted; these are close to the observed transactions discussed here. The IFRS 13 Level 3 inputs are unobservable inputs and may require significant adjustments; these are close to the actor-based methods discussed here.[11]

Categorization of Adjustment Methods

Table 1 describes six basic valuation methods, however usually adjustment methods also will be used.

Table 1 Matrix of Six Basic Valuation Methods

Strategic Variable	Type of Connection to Market	
	Observed Transactions (Sales Comparison Approach)	Knowledge About Actors (Actor-Based Approach)
Price	1. Direct sales comparison approach, where analysis uses observed prices without any intermediating variable, or uses a physical variable from transactions like price per square foot.	4. Where no transactions (or a very limited number) are available, the appraiser uses his or her knowledge of the actors' willingness/ability to pay.
Income	2. Direct capitalization or gross income methods, where a relation between net operating income and price, or between rent and price, is found in transactions of similar properties	5.(a) Discounted cash flow analysis where data is derived from knowledge of actors in the market. 5.(b) Direct capitalization based on knowledge of what actors demand.*
Cost	3. A stable relation is found in observed transactions between (replacement) cost (increases) and price (increases).	6. Knowledge is used about what actors in the market think about the relation between cost (increases) and price (increases).

*This can be a demand relation between net operating income and price (an income return) or between gross rent and price (gross income multiplier).

9. More formal versions of actor-based approaches are also possible. M. Kryvobokov, *Mass Valuation of Urban Land in Ukraine: From Normative to Market-Based Approach* (doctoral dissertation, Royal Institute of Technology. Stockholm, 2007), offers a so-called analytical hierarchy process in order to derive the weight of different factors, determining the market price on land from evaluations made by experts in the specific region under study. Questionnaires to buyers and sellers on a market can, for example, be used to find out how important various characteristics are, e.g., the additional value of a swimming pool, when this cannot be derived from market data.

10. IFRS 13 seeks to increase consistency and comparability in fair value measurements and related disclosures through a "fair value hierarchy." The hierarchy categorizes the inputs used in valuation techniques into three levels. The hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities and the lowest priority to unobservable inputs. (IFRS 13:72) If the inputs used to measure fair value are categorized into different levels of the fair value hierarchy, the fair value measurement is categorized in its entirety in the level of the lowest level input that is significant to the entire measurement (based on the application of judgment). (IFRS 13:73); for additional discussion see http://www.iasplus.com/en/standards/ifrs/ifrs13/#hierarchy.

11. Nordlund discusses in more detail what should be disclosed concerning valuation methods according to the IFRS and how listed European companies live up to these demands for disclosure; see Bo Nordlund, "Need for Disclosure Regarding Property Valuations in Financial Reports according to IFRS," *Journal of Property Investment and Finance* 28, no. 5 (2010): 333–353.

In most cases there remain a number of differences between the subject property and the properties that are the base for the determination of the market value. There might be market data for a certain type of property (Methods 1-3) and the appraiser might have knowledge about how the actors value a specific type of property (Methods 4-6), but in the end there still will be some specific features of the subject property that have not been taken into account. It is argued here that these features can be accounted for using four basic adjustments:

1. Adjustment based on general statistical analysis of the effect of a certain factor.

2. Adjustment based on how a certain feature affects the net present value of an investment.

3. Adjustment based on knowledge of, or the relation between, cost of a certain characteristic and change in market value.

4. Adjustment based on more direct knowledge of actor valuation of certain differences in characteristics.

Adjustment Method 1: General Statistical Analysis

Adjustments to market value may be made based on general statistical analysis of the effect of a particular characteristic. Such general (hedonic) studies look at the effect of a characteristic in a sample covering perhaps a somewhat broader set of properties or a larger market area. This result is then used in the specific case. For example, suppose that the subject property is the only one with a swimming pool in the subdivision, and a statistical analysis in the region in question finds that, on average, the sale price increases $15,000 if there is swimming pool. This figure is then used in the valuation to adjust the estimated value, with the basic value based on a direct sales comparison given other relevant characteristics of the property (size, location, etc.).

Adjustment Method 2: Discounted Cash Flow Analysis

An adjustment also can be made based on how a certain feature affects the net present value of an investment. For example, assume that the appraiser values an office property and uses a direct capitalization approach with data from observed transactions

as a base method. There are still some other specific features of the property that need to be considered (for example, perhaps the subject is "greener" and has lower energy costs). The appraiser then makes adjustments based on the net present value of the reduction in energy cost. Rushmore[12] argues that adjustments could be made by calculating the present value of these differences and making an adjustment with this amount. The difference could concern the rent level, the operating costs, or the larger maintenance expenditure needed in the property under study compared to the properties used in the first basic valuation stage.

Adjustment Method 3: Cost-Based Adjustment

An adjustment in the market value also may be based on more general results of the relation between cost and value. For example, it may have been found in a certain market that if a new roof is put on a building, the market value increases, on average, by an amount that is half the cost. There could be a regression analysis of the cost of an improvement and the price differences showing where there is such a relation. In this way then, Adjustment Method 3 is just a version of Adjustment Method 1. This adjustment is used for the subject property even if there is no specific information from that submarket about the relation in question. Just as in Adjustment Method 1, it is assumed that the market under study behaves roughly like other markets.

Adjustment Method 4: More Direct, Actor-Based Adjustments

Adjustments to market value may be based on more direct knowledge of actor behavior in the market and actor valuation of certain characteristics. For example, in the case of a single-family house with a pool or other feature that is special to the area under study, there might be no similar transactions or relevant data from statistical studies. In such a case, the appraiser might use his or her experience and knowledge about how local actors behave to make an adjustment so that the final estimation is the most probable price on the specific market.

In principle, the four adjustment methods can be combined with almost any of the six basic valuation methods summarized in Table 1. A transparent description of the methods used in a

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12. Stephen Rushmore, *Hotels and Motels: A Guide to Market Analysis, Investment Analysis, and Valuations* (Chicago: Appraisal Institute, 1992).

specific valuation should mention the base valuation method used (one of the six in Table 1 or some mix of them) as well as the method used when making adjustments (one of the four discussed or some mix of them). In any specific valuation, a number of methods can be used to try to find the most probable price, as is illustrated in the examples in Table 2.

What Is the Discounted Cash Flow Approach Really?

The discussion in this article focuses on estimating market value. It is accepted that the discounted cash flow (DCF) approach can be used for estimating an individual investment value and that the projected cash flow, exit value, and rate of return demanded are the values that the individual actor considers. *The Appraisal of Real Estate* states, "The proper application of DCF analysis identifies the market conditions investors are anticipating as of the date of value."[13] The remaining question is the logic behind a claim DCF analysis can lead to an estimated market value.

First, it is important to understand that the specific inputs in DCF analysis cannot be derived from market transaction data alone, as the same observed price may be consistent with a large number of different assumptions concerning the specific variables in the analysis. For example, optimistic assumptions about a property's long-term trend in net operating income in combination with a judgment that it is a rather risky investment (higher discount rate) can lead to exactly the same price as more pessimistic projections about net operating income combined with a more optimistic view about the risk of the property investment. Therefore, what the market thinks about future cash flow and risk cannot be derived from observed transactions alone, as several different projections can be consistent with the same observed prices.[14]

One interpretation of the DCF method for estimating market value is that it is an actor-based approach (see Table 1). The projections of net operating income and demanded rate of return are derived from more-direct knowledge about the expectations of market participants about future cash flow and the rate of return.

A second interpretation of the DCF method is as described in the section on adjustment methods, where a direct capitalization approach is used first

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Table 2 Examples of Valuations Using Basic Methods and Adjustment Methods

Example 1
In this case of the valuation of a commercial property, transactions of similar properties are first analyzed, looking at price per square foot and net capitalization rates (Basic Methods 1 and 2, both versions of the sales comparison approach).

A preliminary estimation of market value is done, giving more weight to the result from the net capitalization approach, as it is known that actors in the market do this (actor-based motive). Some technical systems in the subject property have been renovated, but this is not the case in the comparable properties and an adjustment is therefore made using both a cash flow analysis of reduced operating costs and a direct cost-based adjustment (Adjustment Methods 2 and 3).

Example 2
In this case, land for a residential property development is being valued; since there are no similar land transactions, a market extraction method is used. The first step is a direct sales comparison approach for a number of new properties that were built on land of similar type and location (Basic Method 1).

Next, several actor-based analysis steps are taken. The actors that dominate the market are known to be rational, and the market is reasonably competitive, so there is reason to believe prospective buyers of the land would start with the price for the residential property and then deduct the cost of building, including normal profit; this difference would determine how much they would be willing to pay. By contacting other actors in the market, information about construction costs and profit margins were collected. Going back to Table 1, these steps can be seen as versions of Basic Methods 4 and 6. Various adjustments may also be needed if the properties used in the first stage differ from the subject property.

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13. *The Appraisal of Real Estate*, 14th ed., 529.

14. In exceptional cases, the long-term net operating income is given, e.g., in a very long net lease contract, and then the discount rate could be derived from observed transactions. By making assumptions about all but one variable it is possible to derive the last variable from market data.

and then adjustments are made for specific differences according to how these differences affect the net present value. Behind this use is an assumption that this is how actors on the market evaluate differences between properties. When the DCF method is used only for adjustments to produce a more market-related value, the problems of subjectivity and relation to the market are less severe.

There is, however, a third possible interpretation of the DCF method for estimating market value, which in turn can explain why in some European countries DCF analysis is seen as the best method for valuing a commercial property. Nordlund[15] carried out a series of interviews with Swedish valuers in order to understand how the DCF method is used in practice there. The study findings indicate the valuers view DCF analysis as having three fundamental inputs consisting of

1. estimated net operating income;
2. value at the end of the of time horizon (typically five or ten years in Sweden); and
3. a discount rate.

A later and more thorough study by Bellman[16] points in the same direction.

As previously argued, a certain value today is consistent with an infinite number of combinations of the three fundamental inputs: net operating income, end value, and discount rate. Valuers reduce the number of independent variables by assuming that net operating income increases with inflation. Both the current net operating income (maybe adjusted for special circumstances) and the expected inflation are known. (Sweden's central bank, the Riksbank, has an inflation target of 2% that has been roughly met so far, consequently, it is used by the valuers.) The discount rate used is the estimated initial income return with the assumed inflation rate added.

In order to estimate the exit value, the net operating income the year after the end of the time horizon is capitalized with a terminal capitalization rate (an exit yield), which is related to the real discount rate used. The net operating income is then estimated by starting with the current net operating income and then just adding assumed inflation.

These assumptions mean in the end there is only one independent variable left—the required initial income return at the valuation date. This initial income return rate can be calibrated against transactions in the market. In this way, subjectivity and manipulability are reduced. In other words, the DCF method here is actually very close to a direct capitalization method, and when it is used in this way it should really be in the second column of Table 1, as the initial income-return requirement is derived from observable transaction data.

From a transparency point of view, it would be helpful if the valuer clearly stated that the valuation method used in a case like this basically is a direct capitalization method. However, it could be argued that the presentation of a cash flow analysis should make it easier for a prospective buyer to evaluate whether it is reasonable to pay the current market value. Is the assumption about the development of the net operating income reasonable for the specific market? This could be done in a more transparent way by simply comparing the estimated market value with the individual investment value of a rational buyer.[17]

In practice, valuers also use the DCF framework to make a special adjustment for specific situations; for example, if they know that a specific rental contract expires soon or that there are necessary maintenance expenditures different from those of comparables.

The conclusion is that what European valuers call valuation by a DCF method can be seen as a version of a transaction-based direct capitalization approach, with adjustments made for special factors by estimating the net present value effect of these special factors. In this interpretation, the DCF approach also is fundamentally a sales comparison approach since the initial income return is calibrated against observed transactions.

Concluding Comments

This article has two purposes. The first is to present a developed framework for classifying valuation methods or approaches; the second is to analyze the discounted cash flow method in more detail in this context.

15. Bo Nordlund, "Valuation and Performance Reporting in Property Companies According to IFRS" (doctoral dissertation, KTH Royal Institute of Technology, Stockholm, 2008).

16. Bellman, *Auktoriserade fastighetsvärderares syn på värdering*.

17. A comparison of this type is presented in Neil Crosby and Cathy Hughes, "The Basis of Valuations for Secured Commercial Property Lending in the UK," *Journal of European Real Estate Research* 4, no. 3 (2011): 225–242.

In relation to the first purpose, the premise is that market valuations of real estate start typically with a transaction market analysis. In other words, a comparable sales method is normally the point of departure for a market valuation of real estate. Depending on the activity in the direct property transaction market, other information will have to be applied to a lesser or greater extent. This is typically derived from more-direct knowledge of how actors act in the market. In each specific case, there is more or less weight given to sales comparison data and actor-based information. After the use of a basic valuation approach, adjustments normally are made; these methods can, in turn, be based on more-general market studies or the effect of the difference in characteristics on the net present value.

In relation to the second purpose, it has been argued that the DCF method can stand for a number of different things: a method to calculate the individual investment value, a way to make adjustments to a value derived by a sales comparison approach, an actor-based simulation method, and what seems to be most common in European practice, a version of a direct capitalization approach. In the latter interpretations, the DCF method should also be classified as a sales comparison approach, as the rate of return is calibrated against transaction data.

One limitation of this article is there might be additional ways to link property data to the market, for example, through the stock market value of real estate companies. Several studies[18] show a sizeable positive correlation between the value of listed property shares and underlying real estate assets, at least in the longer term. In practice, however, valuers seem reluctant to use stock market data.

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18. See for example, Steffen Sebastian and Alexander Schätz, *Real Estate Equities—Real Estate or Equities?* IRE BS International Real Estate Business School, December 2009; and Martin Hoesli and Elias Oikarinen, *Are REITs Real Estate? Evidence from International Sector Level Data?* Swiss Finance Institute, Research Papers series no. 12–15 (2012).

Web Connections

Internet resources suggested by the Y. T. and Louise Lee Lum Library

International Financial Reporting Standards
  http://www.iasplus.com/en/standards

Lincoln Institute of Land Policy: Land and Property Values in the U.S.
  http://www.lincolninst.edu/subcenters/land-values/land-prices-by-state.asp

McGraw Hill Construction Dodge Reports
  http://www.construction.com/dodge/

PricewaterhouseCoopers *PwC Real Estate Investor Survey*
  http://www.pwc.com/us/en/asset-management/real-estate/publications/pwc-real-estate-investor-survey.
  jhtml

RealtyRates.com Developer Survey—Market Commentary and Financial Indicators
  http://www.realtyrates.com/learnmore.html