Direct Capitalization, Discounted Cash Flow Analysis and Their Relationship

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INTRODUCTION

The valuation of income-producing property places significant emphasis on the Income Approach. This approach is predicated on the theory of anticipation which is based upon "the perception that value is created by the expectation of benefits to be derived in the future."[1] Therefore, value is based primarily on the expectation of the quality, quantity, duration, and direction (positive or negative) of these future benefits as reflected in net operating income or cash flow.

Direct capitalization and discounted cash flow analysis are the two most commonly used techniques for estimating the value of income producing properties. In light of current commercial real estate market conditions and the potential for significant changes in property values, the following will provide a pragmatic overview of both techniques, outline proper methodologies for their use, discuss some of the relationships between the approaches, and provide some additional points to consider in their application for valuing commercial properties.

Direct capitalization converts a single year's income to value using an overall capitalization rate. The overall capitalization rate (also referred to as the "going-in rate" or "cap rate") is an income rate[2] implicitly encompassing expectations for the future income stream based upon tenancy, quality, class, property age, location, condition, etc. Value is estimated by dividing income by the income rate or capitalization rate.

Discounted cash flow (DCF) analysis converts a series of cash flows to value using a discount rate. The discount rate is a yield rate[3] reflecting an investor's assessment of the risk inherent in the cash flow stream over the projection period, based upon assumptions regarding tenancy, retention ratios, market conditions, obsolescence factors, supply and demand dynamics, etc. Value is estimated by discounting the prospective cash flows and reversion value[4] over the projection period to present value at the selected yield or discount rate.

Although independently developed, the values estimated by each approach are extensively interrelated. Theoretically, the value estimated by each technique should be equal. However, in an imperfect marketplace where investors place emphasis on one or the other approach, results vary. The following provides a brief overview of each technique, discusses sources and methods for deriving capitalization and discount rates, and explores the relationships between the techniques in more detail.

DIRECT CAPITALIZATION

The most common and easily understood technique for converting income into value is direct capitalization. Direct capitalization is, "a method used to convert an estimate of a single year's income expectancy into an indication of value in one direct step, either by dividing the net income estimate by an appropriate capitalization rate or by multiplying the income estimate by an appropriate factor."[5] This paper addresses the former technique. The basic formula for the direct capitalization technique is V = I / R where V is value, I is income (aka net operating income, or NOI), and R is the capitalization rate.

NOI is estimated by deducting vacancy loss and operating expenses from potential gross income (PGI). PGI can include contract rent from in-place leases, market rent, or a combination of both. Other sources of income, such as expense reimbursements, parking income, and other miscellaneous income may also be included in the PGI estimate. Estimates of vacancy and collection loss are based on historic property performance, comparison with comparable properties, and market supply and demand conditions. Operating expenses include items such as real estate taxes, utilities, cleaning, insurance, maintenance and repairs, as well as reserves necessary to ensure effective property operation. NOI is typically estimated before income taxes, depreciation, and interest. Reserves may or may not be deducted in the estimate of NOI provided that comparable properties are analyzed and evaluated in the same manner. A sample calculation of NOI is shown in Figure 1.

FIGURE 1: ESTIMATE OF NOI

Potential Gross Income (PGI)
Less: Vacancy & Collection Loss (V&CL)
= Effective Gross Income (EGI)
Less: Operating Expenses & Reserves
= Net Operating Income (NOI)

Once NOI is estimated, an appropriate capitalization rate must be selected. The overall capitalization rate (Ro) is, "an income rate for a total property that reflects the relationship between a single year's net operating income expectancy and the total price or value."[6] Unlike discounted cash flow analysis, which relies on an explicit return on investment (income/cash flow) and return of investment (reversion), direct

[1] Appraisal Institute, The Appraisal of Real Estate, 13th Edition, p. 35

[2] Income rates convert a single year's income to value. Income rates include the overall capitalization rate (R_0), the mortgage constant (R_m) and the equity dividend rate (RE).

[3] Yield rates convert a series of income streams to value. Yield rates include the discount rate (Y_0); the mortgage interest rate (Y_m) and the equity yield rate (YE).

[4] The future value obtained from the sale of property or property interest at the end of the projection period.

[5] Appraisal Institute, The Appraisal of Real Estate, 13th Edition, p. 499

[6] Appraisal Institute, The Appraisal of Real Estate, 13th Edition, p. 462

capitalization analysis relies on a single year's net income as the basis for estimating value. Accordingly, the capitalization rate implicitly incorporates both a return on and return of investment based on investor expectations about the quality, quantity and future direction of the estimated NOI, as well as expectations for ongoing re-tenanting costs.

The most widely recognized methods for estimating capitalization rates include derivation from comparable sales, effective gross income multipliers, the debt service coverage formula, band of investment techniques, and investor surveys. While all are acceptable, derivation from comparable sales, the band of investment technique, and investor surveys are most commonly used in the current market and we will limit our discussion to those techniques.

- **Derivation from comparable sales** - The most straightforward and preferred method when sufficient data is available, this technique extracts an overall capitalization rate from a comparable sale by dividing the selling price by NOI. Rates extracted from actual sales reflect both buyers' and sellers' expectations regarding the direction and magnitude of future income. However, the buyer's analysis of the expected income stream for a particular property often produces the most reliable estimate of a sale's overall capitalization rate. This method of deriving capitalization rates is particularly effective in a stable market or markets in which no dramatic governmental, environmental, economic or social forces are rapidly influencing value.

  The terms and quality of leases encumbering a property, market rents, and occupancy often affect the extracted capitalization rate. A property operating at less than stabilized performance may exhibit a capitalization rate for the initial year of the investment lower than might be expected for a stabilized property, because it incorporates expectation for increases in the income stream as performance improves. Conversely, a property with short-term contract rents in excess of market levels may produce a capitalization rate higher than would be found on a stabilized property due to the expectation for a declining future income stream. In all cases, capitalization rates extracted from the comparable sales provide market evidence of investor expectations under specific property and market conditions.

- **Band of Investment** - The band of investment technique (using mortgage and equity components) is frequently used to estimate capitalization rates, or to demonstrate support for rates derived from comparable sales. This technique uses a cost of capital formula to calculate weighted average returns to debt and equity based on market parameters for each component. The weighted sum of these returns results in an overall capitalization rate, as illustrated in Figure 2. As previously discussed, the overall capitalization rate (R_O) is an income rate used to convert a single year's income to value. Therefore, the primary inputs to the equation, the mortgage constant (R_M)[7] and the equity dividend rate (R_E)[8] are income rates used to convert a single year of debt service and after debt cash flow to the values of the mortgage and equity positions, respectively. The mortgage constant and annual debt service are estimated based on the interest rate and amortization period of the loan. The equity dividend rate is estimated by deducting annual debt service payments from NOI and dividing the result by the equity investment in the sale. To illustrate, assume the following: (1) $1,000,000 purchase price, (2) NOI of $90,000, (3) mortgage at 65% of price with a 7.50% interest rate and 25-year amortization (R_M of 8.87%), and (4) R_E of 9.25%. Using the band of investment formula, an overall capitalization rate of 9.00% is calculated in Figure 3 (interim calculations are rounded for illustrative purposes).

FIGURE 2: BAND OF INVESTMENT TECHNIQUE

Component	Ratio		Rate
Debt	LTV	x	R_M
+ Equity	1-LTV	x	R_E
= Overall Capitalization Rate			R_O

Where:
LTV = Loan to value ratio
R_M = Mortgage Constant (annual debt service/ loan amount
R_E = Equity Dividend Rate (annual equity dividend/equity investment)

- **Investor Surveys** - Investor surveys have become an increasingly popular source for capitalization rates in recent years. These surveys are completed on a periodic basis by several large and respected real estate valuation and consulting practices in the United States. They rely on queries of investors in specific property categories and regions to provide benchmark information on expectations for investment parameters given current market conditions. In dynamic markets, the surveys reflect investor expectations, not retrospective decisions under possibly different conditions, and often provide meaningful input to support capitalization rate selection. Examples of investor surveys include the *Korpacz Real Estate Investor Survey* by Pricewaterhouse Coopers LLP, the *RERC Real Estate Report* by Real Estate Research Corporation, and *Viewpoint* by Integra Realty Resources.

FIGURE 3: BAND OF INVESTMENT TO ESTIMATE R_O

Component	Ratio x Ratio	Weighted Rate
Debt	65% x 8.87%	5.76%
Equity	35% x 9.25%	3.24%
R_O		9.00%

[7]An example calculation of R_M is as follows: $57,641 Annual Debt Service divided by $650,000 Loan Amount equals an 8.87% Mortgage Constant

[8]An example calculation of R_E is as follows: $90,000 NOI less $57,641 Annual Debt Service equals $32,359 Cash Flow After Debt Service. $32,359 Cash Flow After Debt Service divided by $350,000 Equity Investment equals a 9.25% Equity Dividend Rate

After NOI is estimated and the appropriate capitalization rate is selected, the basic formula V = I / R can be applied. To illustrate, assume the following: 1) $90,000 NOI and 2) 9.0% capitalization rate. Value is calculated as shown in Figure 4.

FIGURE 4: DIRECT CAPITALIZATION SAMPLE

	Year 1
PGI	$170,000
Less: V&CL	$17,000
= EGI	$153,000
Less: Expenses & Reserves	$63,000
= NOI	$90,000
V = I/R	
V = $90,000/9.0%	
V = $1,000,000	

DISCOUNTED CASH FLOW ANALYSIS

Discounted cash flow analysis converts a series of anticipated periodic income streams and the anticipated net proceeds of a future property sale to present value. This approach requires forecasting all future cash flows during an anticipated holding period, estimating the resale (reversionary) value at the end of the holding period, selecting an appropriate discount period, and converting the future cash flows into present value.[9]

Unlike direct capitalization (which uses a single year's NOI), discounted cash flow analysis relies on net cash flow before debt service over an anticipated holding period. Net cash flow before debt service reduces NOI for the cost of tenant improvements, leasing commissions and other capital costs expected during the projection period.[10] This approach requires detailed lease information and makes explicit assumptions about re-leasing, market rents, tenant improvements, leasing commissions, etc., impacting the quality, quantity, and direction of the anticipated cash flow stream. The analysis period is primarily dictated by market convention for a particular property type, and/or by the investor's investment parameters.

In addition to estimating cash flows during the holding period, the resale (or reversion) value of the property at the end of the investment-holding period must be estimated. This value is typically estimated by applying a capitalization rate ("terminal," "reversionary," or "going-out" rate) to the NOI in the year following the last year of the holding period. The primary considerations in estimating value at the time of reversion in the subsequent holding period are 1) the expectation of change in income growth rates, 2) magnitude of property appreciation or depreciation, and 3) expected rates of return. If each of these three expectations were the same for the subsequent holding period as for the initial holding period, the going-out and going-in capitalization rates would be similar. If the income growth rate and the property appreciation rates are anticipated to decline (or increase) in the subsequent holding period, then the going-out rate may be higher (or lower) than the going-in rate.

Mirroring the actions of the marketplace, investors have typically estimated terminal capitalization rates at 50 to 100 basis points above current, stabilized capitalization rates. This relationship is based on the premise a property would be somewhat less competitive in the future due to aging, functional issues, new supply entering the market, and future uncertainty regarding market conditions, etc. These factors combine to typically produce a higher going-out capitalization rate.

On the other hand, sufficient rationale may exist among some property types and in some markets to warrant an equivalent and, in exceptional cases, a lower going-out capitalization rate. For example, in the early 1990s the excess supply of real estate produced a prolonged period of abnormally high capitalization rates. Since these capitalization rates reflected the expectation that income streams would decline as above market rents rolled down to market, many real estate investors used very high going-in capitalization rates and correspondingly lower going-out capitalization rates. This rationale recognized imbalances in the markets at that time and reflected the expectation of relative equilibrium in future periods.

Once the cash flows and resale value are estimated, a discount rate is needed to convert the cash flows to present value. The discount rate [or prospective internal rate of return (IRR) or yield] is defined as, "the annualized yield rate or rate of return on capital that is generated or capable of being generated within an investment or portfolio over a period of ownership."[11] Because discounted cash flow analysis makes explicit estimates of the anticipated return on investment (income/cash flow) and return of investment (reversion), the discount rate reflects the risk associated with receiving these benefits over the holding period.

Among the most commonly used methods for estimating/selecting a discount rate are derivation from comparable sales, comparison with alternative investment yields, investor surveys, and the band of investment technique.

- **Derivation from Comparable Sales** - Comparable sales provide a reliable indicator of investors' yield expectations, particularly when an investor's anticipated yield (on discount rate) is discernible. The discount rate, or yield,

[9] Traditional discounted cash flow analysis is performed on income or cash flow before income taxes. However, income tax rates and strategies do affect what investors are willing to pay for a property. Tax-exempt investors such as pension funds may be willing to pay more for a property since they are not paying taxes on the operating income of the property. This should be considered when analyzing sales involving tax-exempt purchasers or survey responses from the same.

[10] In some property types such as apartments and hotels, it is convention to account for all expenses including reserves above net operating income. Therefore, for these property types cash flow before debt service and net operating income are often the same.

[11] Appraisal Institute, The Appraisal of Real Estate, 13th Edition, p. 545

applied in a discounted cash flow analysis reflects expectations about future property performance as reflected in the income or cash flow stream. (If a property were to operate exactly as projected over its holding period, the discount rate and the IRR would be equal.) Interviews with purchasers can provide benchmark yield expectations as reflected in the discount rate applied to the cash flow stream to estimate value or purchase price. Because this rate is based on the perceived risk of achieving the anticipated cash flows and reversion, the buyer's opinion of the prospective discount rate is typically more relevant than the retrospective IRR generated for the seller.

The IRR is the yield rate earned for a given capital investment over the period of ownership. The "true" retrospective IRR can only be calculated at the end of an investment to measure actual performance against expected returns. The retrospective IRR compares the seller's original purchase price to the cash flows actually generated over the holding period as well as the final actual selling price. IRRs extracted from comparable sales may not be a reliable yield indicator for a prospective investment because they measure historic performance, not future expectations.

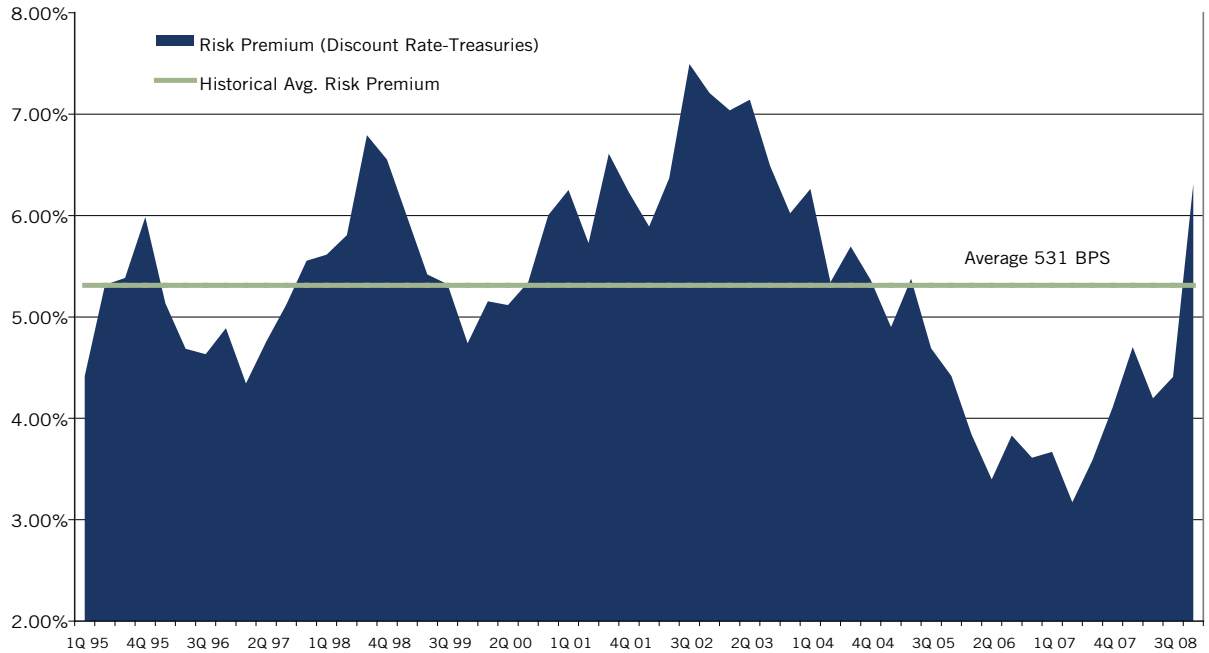
- **Comparison with Alternative Investment Yields** - Because real estate capital competes with other investments, discount rates can also be estimated by comparison to monetary yields with adjustments for risk and liquidity. Investors often consider the relationship between real estate yields and yields on alternative investments such as municipal bonds, corporate bonds, treasury bills and junk bonds.

One method to assess discount rate reasonableness is to consider the risk premium between the discount rate and a risk free or safe rate (U.S. Treasury Yields). This premium accounts for risk factors such as tenant credit, management, and liquidity inherent to real estate investment. Comparison of the historic basis point spread or risk premium (1.0% = 100 basis points) between real estate yields and 10 Year U.S. Treasury Yields can provide a framework for selecting a discount rate.

As illustrated in the graph on the following page, between 1995 and 2008 risk premiums ranged from a low of just over 300 basis points to a high of over 700 basis points, averaging 531 basis points during this time. This range has been driven by shifting Treasury Yields, real estate supply and demand dynamics, liquidity in the markets, and general economic conditions. However, at any point in time, the reasonableness of a selected discount rate can be assessed by reviewing current market risk premiums.

For example, assuming an investor has selected a 10.0% discount rate and the current 10 Year U.S. Treasury Yield is 3.0%, the implied risk premium is 7% or 700 basis points. If market evidence indicates current risk premiums for comparable properties are in this range, the selected discount rate may be reasonable.

HISTORIC RISK PREMIUMS: REAL ESTATE DISCOUNT RATES VS. 10-YEAR TREASURY YIELDS



Source: PWC Korpacz and U.S. Federal Reserve

- **Investor Surveys** - As previously discussed, investor surveys represent another source for determining investment parameters such as discount rates. These surveys reflect respondents' assumptions of risk and return used in evaluating current holdings and investment opportunities. Surveys reflect investor expectations, not retrospective decisions, which is useful in dynamic markets.
- **Band of Investment Technique** - While this technique is not typically used to derive a discount rate, it can provide a benchmark to assess the reasonableness of a rate selected on a particular investment. Please note, this technique only provides an approximation of the discount rate unless the LTV is constant over time.

  As illustrated in Figures 5 and 6, this technique uses a cost of capital formula similar to the one discussed in the direct capitalization section to calculate weighted average returns to debt and equity. The end result is an approximate yield and not an income rate, and the component inputs are adjusted accordingly.

FIGURE 5: BAND OF INVESTMENT FOR DISCOUNT RATES

Component	Ratio		Rate
Debt	LTV	x	Y_M
+ Equity	1-LTV	x	Y_E
= Discount Rate			Y_O

Where:
LTV = Loan to value ratio
Y_M = Mortgage Interest Rate
Y_E = The equity investor's yeild rate

FIGURE 6: EXAMPLE OF DISCOUNT RATE CALCULATION

Component	Ratio x Ratio	Weighted Rate
Debt	65% x 7.50%	4.88%
Equity	35% x 20.0%	7.00%
Y_O =		11.88%

The discount rate (Y_O) is a yield rate used to convert a series of incomes to value. Therefore, the primary inputs in this equation, the mortgage interest rate (Y_M) and the equity yield rate (Y_E)[12], are yield rates used to convert debt service and after debt service cash flow to the values of their respective positions. To illustrate, assume the following: (1) $1,000,000 purchase price, (2) mortgage at 65% of price with a 7.50% interest mortgage and 25-year amortization, and (3) equity investor's yield requirement of 20.0%. Using the band of investment technique, a discount rate of 11.88% is calculated.

After the appropriate income and discount rate are selected via the procedures noted above, the discounted cash flow technique can be applied. To illustrate, assume the following: 1) $90,000 net income growing at 3% per year, 2) reversion value based on a 9% capitalization rate applied to Year 6 income, and 3) a 12% discount rate. The value indicated from the five-year discounted cash flow analysis is $1,000,000, as shown in Figure 7.

FIGURE 7: DISCOUNTED CASH FLOW SAMPLE

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
PGI	$170,000	$175,100	$180,353	$185,764	$191,336	$197,077
Less: V&CL (10%)	$17,000	$17,510	$18,035	$18,576	$19,134	$19,708
= EGI	$153,000	$157,590	$162,318	$167,187	$172,203	$177,369
Less: Expenses	$63,000	$64,890	$66,837	$68,842	$70,907	$73,034
=NOI	$90,000	$92,700	$95,481	$98,345	$101,296	$104,335

Present Value of Income Stream	Income	PV Factor @ 12%	Present Value		
Year 1	$90,000	0.892857	$80,357		
Year 2	$92,700	0.797194	$73,900		
Year 3	$95,481	0.711780	$67,961		
Year 4	$98,345	0.635518	$62,500		
Year 5	$101,296	0.567427	$57,478		
Year 6 (Reversion) $104,335/0.09 = $1,159,278		0.567427	$657,806		
Total Present Value			$1,000,003	rounded to	$1,000,000

RELATIONSHIP BETWEEN APPROACHES

Direct capitalization and discounted cash flow analysis are not entirely independent approaches to valuation. They are based on similar fundamentals and each approach can be used to test the reasonableness of the other. While both approaches should produce similar results, comparable property data may be unavailable and/or market dynamics

[12] Y_E is a discount rate that will make the present value of all the future equity benefits equal to the equity investment.

FIGURE 8: DISCOUNT/CAPITALIZATION RATE RELATIONSHIP

$Y_O = R_O + CR$

Where:
Y_O = Yield rate or discount rate
R_O = Overall capitalization rate
CR = Compound rate of change in income & value

may be difficult to ascertain, resulting in value differences.

The relationship between direct capitalization and discounted cash flow analysis is primarily tied to expectations for the quality, quantity, duration, and direction of the future income stream. "When an investor looks forward to property appreciation as a component of eventual investment yield, the investor is anticipating that the total yield rate will be higher than the initial year's expected rate of income - i.e., the overall capitalization rate."[13] While valuation theory provides several formulas for this relationship, each predicated on the anticipated pattern of future income and/or value, one of the most widely used is illustrated in Figure 8. This formula indicates the discount rate (Y_O) is a function of the going-in capitalization rate (R_O), plus the compound rate of change (CR)[14] in income and value over the holding period.

If income and value are expected to increase at the same compound annual rate (say 3%) over a holding period, and the overall capitalization rate is 9%, then the discount rate should be 12%. In other words, the value estimated by applying a 9% capitalization rate to year one income, would be similar to the value estimated by discounting the income stream at 12% over the holding period. This relationship, assuming year one NOI is $90,000 and the reversion is estimated by capitalizing year 6 income at 9%, can be proven as illustrated in Figure 9 below.

FIGURE 9: TESTING THE RELATIONSHIP BETWEEN THE APPROACHES

Direct Capitalization	**NOI**	**Cap Rate**	**Value**
Year 1	$90,000	9.00%	$1,000,000
DCF	Income	PV Factor @ 12%	Present Value
Year 1	$90,000	0.892857	$80,357
Year 2	$92,700	0.797194	$73,900
Year 3	$95,481	0.711780	$67,961
Year 4	$98,345	0.635518	$62,500
Year 5	$101,296	0.567427	$57,478
Year 6 (Reversion)	$104,335/0.09 = $1,159,278	0.567427	$657,806
Total Present Value			$1,000,003
Rounded			$1,000,000

Other relationships can also be derived from this equation. For example, if NOI and value are expected to remain level over the projection period, an investor's income return will be unaffected by appreciation or depreciation. Therefore, the capitalization rate and the discount rate must be the same to provide an investor an adequate return on invested dollars. Furthermore, if the formula is algebraically altered to solve for the overall capitalization rate ($R_O = Y_O - CR$), the reasonableness of a selected capitalization rate can be tested by deducting the anticipated annual compound rate of change in income and value over the holding period from the discount rate. In a stabilized property, if this test produces a discount rate similar to the overall rate calculated by dividing year one income into value, the selected discount rate is likely reasonable.

OTHER CONSIDERATIONS

While the preceding has described the direct capitalization and discounted cash flow analyses and their relationships, a number of other items also warrant consideration with respect to the selection and reasonableness of capitalization and discount rates. These include the influence of leverage and the valuation of unstabilized properties.

Influence Of Leverage

Leverage is commonly used to enhance the purchasing power of real estate investors and to increase returns. The reasonableness of capitalization and discount rates can be assessed by understanding the effect leverage has on real estate investment. Returns to the equity and mortgage positions can

FIGURE 10: LEVERAGE RELATIONSHIPS

Direct Capitalization	$R_M < R_O < R_E$
DCF	$Y_M < Y_O < Y_E$

Where:

R_M = Mortgage Constant	Y_M = Interest Rate
R_O = Overall Rate	Y_O = Discount Rate
R_E = Equity Dividend Rate	R_E = Equity Yield Rate
Y_E = Equity Yield Rate	

[13] Appraisal Institute, The Appraisal of Real Estate, 13th Edition, pp. 531-532

[14] The compound rate of change can be calculated using the HP-12C. For a 10-year DCF analysis (with the 11th year NOI used to estimate the reversion), enter year 1 NOI in PV (as a negative), year 11 NOI in FV, enter 10 in n and solve for i.

be envisioned along a return continuum. Expected return relationships between these positions are illustrated in Figure 10.

Equity investors, who assume the highest level of risk, expect returns (R_E and Y_E) at the high end of the continuum. Mortgage investors' returns (R_M and Y_M), on the other hand, are typically at the lower end of the return continuum since they represent a secured interest in the property at a percentage of price or value. Returns to the overall property (R_O and Y_O) are a weighted average of the equity and mortgage positions. This relationship forms the premise for positive leverage, in which the return to the equity position is greater than both the return to the property and mortgage positions. Since equity investors expect returns to be enhanced as a result of positive leverage, a relationship between components that suggest otherwise may be cause for concern.

To illustrate how this relationship can be used to assess the reasonableness of capitalization and discount rates, consider the following. In Example 1, solving for the equity dividend rate (R_E) can be used to check the reasonableness of the overall capitalization rate. The weighted return to the debt component is 5.766% (65% x 8.87%). Subtracting 5.766% from the overall capitalization rate results in a weighted return to equity of 3.234%. Solving for the equity dividend rate by dividing the weighted equity return by its ratio (35% in this example), produces a result of 9.24%. Because the equity dividend rate is greater than both the mortgage constant (R_M) (8.87%) and the overall capitalization rate (R_O) (9.00%) leverage is positive and the overall capitalization rate would be considered reasonable.

EXAMPLE 1 – TESTING CAPITALIZATION RATES

NOI Year 1	$90,000
Price:	$1,000,000
LTV	65%
Mortgage rate (Y_M)/Term	7.50%; 25 yrs.
Mortgage Constant (R_M)	8.87%
Overall Cap. Rate (R_O)	9.00%

Component	Ratio x Rate	Weighted Rate
Debt	65% x 8.87%	5.766%
Equity	35% x R_E	3.234%
R_O =		9.000%
Solve for R_E	3.234%/35%	9.240%

EXAMPLE 2 – TESTING DISCOUNT RATES

NOI Year 1	$90,000
Price:	$1,000,000
LTV	65%
Mortgage rate(Y_M)/Term	7.50%; 25 yrs.
Mortgage Constant (R_M)	8.87%
Discount Rate (Y_O)	12.00%

Component	Ratio x Rate	Weighted Rate
Debt	65% x 7.50%	4.875%
Equity	35% x Y_E	7.125%
Y_O =		12.00%
Solve for Y_E	7.125%/35%	20.36%

In Example 2, solving for the equity yield rate is used to check the reasonableness of the discount rate. As illustrated, the weighted return to the debt component is 4.875% (65% x 7.50%). Subtracting 4.875% from the discount rate results in the weighted return to equity. Solving for the equity yield rate by dividing the weighted equity return by its ratio (35% in this example), produces a result of 20.36%. Because the equity yield rate is greater than both the mortgage interest rate (7.50%) and the discount rate (12.00%), leverage is positive and the discount rate would be considered reasonable.

UNSTABILIZED PROPERTIES AND DIRECT CAPITALIZATION

While much of the foregoing discussion presumes a stabilized level of property operation, most properties do not consistently operate accordingly. Although discounted cash flow explicitly addresses these situations by accounting for the associated changes in cash flow during these transitionary periods, direct capitalization requires a more thoughtful analysis to ensure the reasonableness of value conclusions. In the following section, we will explore how to effectively address several of these situations.

- **Properties that have not yet reached stabilization** - In this situation, value can be derived by (1) estimating a stabilized value and then deducting the cost to reach stabilized occupancy, or (2) selecting a capitalization rate reflective of current occupancy and upside potential in the income stream. In the former case, a stabilized value is estimated by applying a capitalization rate to a stabilized estimate of NOI. Next, the expenses (tenant improvements, leasing commissions, non-reimbursed operating expenses) and income loss incurred to reach stabilized occupancy are

deducted from the stabilized value estimate to determine the value of the property "as is". If lease-up is expected to take more than a year, these expenses should be discounted to present value before deducting from the stabilized value.

Alternatively, because of expectations for future income growth due to lease-up, an investor may be willing to accept a lower initial return in exchange for future income growth and appreciation. In this case, a lower than "market" capitalization rate could be applied to "current" NOI (actual in-place income at the current occupancy level) to estimate the "as is" value of the property.

- **Properties with above market rents** - For properties with these characteristics, value can be estimated by (1) estimating NOI using market rents and adding back the present value of the above market cash flow stream over the remaining terms those rents are in place, or (2) selecting a capitalization rate reflective of the current in-place rents and the potential for a declining future income stream. In the former approach, value is first estimated by capitalizing NOI based on market (not contract) rents. Next, the incremental income attributable to the above market rents is estimated by deducting the income stream at market rents from the income stream at contract rents (for the remaining period contract rents are in place). The incremental difference is next discounted to present value at a rate reflective of the tenant(s) ability and likelihood of paying the above market rent through the remainder of the lease term(s), considering the magnitude of the above market rent. In most cases this would be a discount rate in excess of the rate applied to the discounting of stabilized cash flows. Finally, the present value of the above market income stream is added to the stabilized market value.

  Alternatively, if future deterioration in the income stream is expected due to lease expiration and the reduction of contract rent to market levels, a higher than "market" capitalization rate could be applied to "current" NOI to estimate the value of the property.

- **Properties with significant near- to mid-term rollover exposure** - Value can be estimated by (1) capitalizing the stabilized NOI at an appropriate capitalization rate and deducting the estimated tenant improvement, leasing commission and lost income expenses associated with rollover, or (2) selecting a capitalization rate reflective of the near-term rollover costs. In the former situation, because re-leasing costs are (1) typically not included in the estimate of NOI, and (2) expected to occur in the near term, their impact should be accounted for as a deduction from stabilized value to properly estimate the current value of the property.

  As an alternative, because an investor's return would be impacted by these costs, a higher than "market" capitalization rate could be applied to the "current" NOI to estimate the property's value. This capitalization rate compensates the investor for the deterioration in future return associated with these re-lease expenses and reflects the risk associated with the rollover.

SUMMARY

Direct capitalization and discounted cash flow analysis form the basis of the Income Approach and can be used to estimate the value of income producing properties if their fundamentals are properly applied. The relationship between these approaches is tied to a property's income stream and the expectation for the quality, quantity, duration, and direction, of that income stream. The various techniques and checks of reasonableness discussed herein provide a methodology to assess the results of alternative approaches to valuation and compare the reasonableness of conclusions, as well as the selected capitalization and discount rates. A proper understanding of the application of these methodologies and the relationships between the approaches form the basis for reliable estimates of value under a myriad of property conditions.

Biographies

Diane M. Norton, Director, MAI

Diane Norton is a member of Babson Capital's Real Estate Finance Group. She is responsible for providing valuation support to the Real Estate Finance Group. She joined the firm in 1996 and presently oversees valuations on new loan originations, annual loan reviews, workouts and foreclosures. Prior to her current role, Diane was responsible for the valuations of Cornerstone Real Estate Advisors (wholly owned subsidiary of MassMutual) $3.3 billion equity portfolio. She also worked for several years as a fee appraiser in Connecticut prior to joining Babson/MassMutual. Diane earned her Bachelor of Science Degree in Finance from the University of Connecticut, holds the MAI designation, and is an active member of the Appraisal Institute.

Jeffrey J. Williams, Managing Director

Jeffrey J. Williams is a member of Babson Capital's Real Estate Finance Group. He leads the mortgage loan co-investment/syndication team. He joined the firm in 1991 as the Chief Appraiser and has more than 29 years of industry experience in such areas as commercial property leasing and brokerage, development, property management, appraisal and commercial mortgage finance. In addition to having his own property management and development company, he held real estate appraisal positions at J.W. Hoyt Associates in Oklahoma City, OK and Cushman & Wakefield in Philadelphia, PA. He has a B.A. in Economics from Rutgers College and a M.S. in Business Administration from North Dakota State University. He served as chair of the Portfolio Investors and International Committees of Mortgage Bankers Association, as well as 5 years on the Board of Trustees of the Appraisal Foundation.

Joseph N. Iadarola, Jr., Managing Director, CRI, CCIM

Joe Iadarola is a member of Babson Capital's Real Estate Finance Group. He joined Babson in 1991, and is currently involved with mortgage loan originations in the Northeast Regional Office. In that role he has been responsible for the origination, underwriting and closing of over $700 million of commercial real estate loans in the Northeast U.S. and Canada, for office, hotel, industrial and multifamily properties. Joe previously held the position of Chief Appraiser for Babson Capital/MassMutual Life Insurance Company, where he was responsible for overall valuation activities related to a $4 billion mortgage and $2 billion equity real estate portfolio, comprised of institutional quality office, retail, industrial, multifamily and hotel assets. He also spent a year in the loan syndication group where is participated in the syndication of over $150 million of loans to external clients. Joe earned a Bachelor of Science Degree in Business Administration from the University of Connecticut and currently holds the Chartered Realty Investor (CRI) and Certified Commercial Investment Member (CCIM) designations.

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