

Discounted Cash Flow Analysis

The primary steps in DCF analysis are:

1. Determine a typical holding period for the type of property being appraised based on market behavior.
2. Forecast the future cash flows over the holding period, including the reversionary cash flow (sales price at the end of the holding period).
3. Select an appropriate yield/discount rate, given the risk of the cash flows.
4. Convert each cash flow into its present value amount through the discounting process:
and
5. Sum these present values to arrive at an estimate of the value of the Income Stream
6. Determine going-out or Reversionary Value
7. Deduct sales cost to arrive at Net Proceeds
8. Estimate Present Worth of Reversion
9. Add together the Present Worth of Income Stream and Present Worth of Reversion to arrive at Capitalized Property Value by DCF

Example 5

The subject apartment complex has 20 units that rent for \$525 per unit, per month. During recent years investors have been purchasing apartment complexes with the anticipation of receiving rental payments over a relatively short holding period. Typical holding periods are five years. The reversion, the estimated sale price at the termination of the investment, is based on the direct capitalization of the projected sixth year income. Investors are forecasting that income will increase at a rate of 5 percent per year. Owners of comparable properties and the subject property expect that vacancy and collection losses will be 3 percent of the potential gross income. The forecasted expenses for the first year are:

Maintenance and Repair	\$12,750
Insurance	\$ 4,500
Utilities	\$ 4,500
Swimming Pool	\$ 1,500
Management	\$ 6,300

Management expenses are expected to increase at 5 percent per year. Maintenance and repair is expected to increase at 2 percent per year. Based on past history, the utilities are expected to increase at 10 percent per year. The swimming pool expense is projected to remain stable during the entire holding period. The insurance premiums are anticipated to increase at \$100 per year; however, for property owners that purchase a three-year policy, the premium is based on last year's rate. Owners typically purchase a one-year policy the first and last year of the holding period and a three-year policy for the middle three years. The yield rate expected by the owners of comparable properties is 15 percent. The income rate (R_o) derived from sales of comparable properties is 10 percent. The tax rate for the area is 1 percent of assessed value.

Based on the above information and using yield capitalization techniques, the subject property is valued as follows:

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
PGI	\$126,000	\$132,300	\$138,915	\$145,861	\$153,154	\$160,811
V & C	(\$3,780)	(\$3,969)	(\$4,167)	(\$4,376)	(\$4,595)	(\$4,824)
EGI	\$122,220	\$128,331	\$134,748	\$141,485	\$148,559	\$155,987
EXPENSE:						
M & R	(\$12,750)	(\$13,005)	(\$13,265)	(\$13,530)	(\$13,801)	(\$14,077)
INSURANCE	(\$4,500)	(\$13,500)	\$0	\$0	(\$4,900)	(\$5,000)
UTILITIES	(\$4,500)	(\$4,950)	(\$5,445)	(\$5,990)	(\$6,588)	(\$7,247)
POOL	(\$1,500)	(\$1,500)	(\$1,500)	(\$1,500)	(\$1,500)	(\$1,500)
MANAGEMENT	(\$6,300)	(\$6,615)	(\$6,946)	(\$7,293)	(\$7,658)	(\$8,041)
NIBR&T	\$92,670	\$88,761	\$107,592	\$113,172	\$114,112	\$120,122
Rn						0.11
REVERSION						\$1,092,018
PW\$1 (16%)	0.862069	0.743163	0.640658	0.552291	0.476113	0.476113
PRESENT VALUE	\$79,888	\$65,964	\$68,930	\$62,504	\$54,330	\$519,924
Total Value						\$851,540

[Assessors' Handbook Section 502, Chapter 4, Page 100 example:](#)

Yield Capitalization starts at page 86.

EXAMPLE 4-18: Valuation Using Discounted Cash Flow Analysis

Set forth below are the assumptions on which the valuation is based. As with direct capitalization, the income to be capitalized is estimated on a market basis and is processed to the level of net operating before recapture and taxes (NIBR&T). The reversionary value is estimated as described below. A component for ad valorem property taxes must be added to both the yield rate and the overall capitalization rate.

Assumptions

Expected holding period	5 years
Rentable area	60,000 sf
Annual rent (gross rent basis)	\$24.00/sf rentable area
Annual vacancy and collection loss	6% of anticipated gross income
Annual operating expenses (excl. property taxes)	\$8.00/sf rentable area
Market rents to grow at 4% a year	
Operating expenses to grow at 2% a year	
Terminal overall capitalization rate (R_o)	10.0%
Overall yield rate (Y_o)	14.0%
Ad valorem tax rate	1.0%

Estimated Annual Cash Flows

	Year 1	2	3	4	5	6
MPGI	1,440,000	1,497,600	1,557,504	1,619,804	1,684,596	1,751,980
V&C Loss	86,400	89,856	93,450	97,188	101,076	105,119
MEGI	1,353,600	1,407,744	1,464,054	1,522,616	1,583,521	1,646,861
Operating Exp.	480,000	489,600	499,332	509,380	519,567	529,959
NIBR&T	873,600	918,144	964,662	1,013,236	1,063,953	1,116,903

Estimated Value of the Reversion Using Direct Capitalization

The value of the reversion, or terminal value, is estimated by capitalizing the 6th year's income at an overall capitalization rate of 11.0%. (R_o of 10.0% and effective ad valorem tax rate of 1%). For simplicity, the example assumes that this estimated reversion value is net of any disposition costs.

$$\begin{aligned}\text{Reversion/terminal value} &= 6\text{th year's income} / R_o + \text{ETR} \\ &= 1,116,903 / 0.10 + 0.01 \\ &= 1,116,903 / 0.11 \\ &= 10,153,663\end{aligned}$$

Present Value Calculations

The present value factors are based on the yield rate plus the effective tax rate (in this case, 14%+1%=15%).

Year	Cash Flow		PV Factor	=	PV
1	873,600	x	0.869565	=	759,652
2	918,144	x	0.756144	=	694,249
3	964,662	x	0.657516	=	634,281
4	1,013,236	x	0.571753	=	579,321
5	1,063,953	x	0.497177	=	528,973
Reversion	10,153,663	x	0.497177	=	<u>5,048,163</u>
			Total present value		8,244,639

The estimated value of the property is \$8,244,639, say **\$8,244,500**.