

APPENDIX C

Capitalisation^(BrE) or Capitalization^(AmE)

Capitalisation for a limited period of time may be expressed by the formula:

$$C_v = \frac{a_1}{(1+r)} + \frac{a_2}{(1+r)^2} + \frac{a_3}{(1+r)^3} + \dots + \frac{a_n}{(1+r)^n}$$

Where:

C_v = the capital value

$a_1, a_2, a_3 \dots a_n$ = the income or cash flow receipts in each period of time.

r = capitalisation rate, expressed as a decimal

n = number of periods of time (or years)

When the income is constant, straight capitalisation produces a capital value = a/r , where a = income and r = capitalisation rate.

Internal Rate of Return

The rate of interest that discounts a series of future cash flows or income returns to make them equal to the total cost or outlay on the investment that generates those cash flows or income returns; the one rate of interest at which the **present value** of all expenditure on an investment equals the present value of all receipts from that investment (i.e. the discount rate when the **net present value** is zero). The internal rate of return may be calculated solving for r in the formula:

$$P_0 = \sum_{i=1}^{i=n} \frac{R_i}{(1+r)^i} + \frac{P_n}{(1+r)^n}$$

Where:

P_0 = initial cost

R_i = income during period i (or per annum), in arrears

P_n = value of reversion

or **redemption value** in period n (or the scrap value after n years)

n = number of periods (or years)

r = internal rate of return

Thus, if P_0 is the price paid for an investment, which produces a periodic (or annual) income in arrears of R_i for n periods (or years), and the investment is sold at the end of that period for P_n then the equivalent annual return over the life of the investment is r . Under this formula, it is assumed that all income received from the investment is reinvested during the term of the investment at the same rate. The rate calculation may be 'adjusted' by applying a lower or safer rate to the income received throughout the term of the investment.