

CH8 & 9 Concepts and Definitions

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1 Ch8

1.1 spot rates and forward rates

1. spot rate r_t = no-coupon rate = annual effective interest rate for now

1.2 Swaps

1. swaps
 - (a) accreting = increasing
 - (b) amortizing = decreasing

2 CH9

2.1 Macaulay Duration and Modified duration

$$\begin{aligned}
 P(i) &= \sum_t^{max} C_t(1+i)^{-t} \\
 D(i, \infty) &= \frac{1}{P(i)} \sum_{min}^{max} t * C_t(1+i)^{-t} \\
 D(i, 1) &= \frac{\frac{-dP}{di}}{P(i)} \\
 D(i, m) &= \frac{\frac{-dP}{di^{(m)}}}{P(i)} \\
 D(i, \infty) &= (1+i)D(i, 1) = D(i, 1)(1 + \frac{i^{(m)}}{m}) \\
 (Ia)_{\overline{n}|i} &= \frac{\ddot{a}_{\overline{n}|i} - nv^n}{i}
 \end{aligned}$$

2.2 Convexity

$$\begin{aligned}
 C(i, \infty) &= \frac{1}{P(i)} \sum_{min}^{max} t^2 * C_t(1+i)^{-t} \\
 C(i, m) &= \frac{\frac{d^2P}{d(i^{(m)})^2}}{P(i)} \\
 C(i, 1) & \tag{1}
 \end{aligned}$$