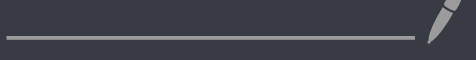


ACT240 Lec 1

Content:

Part I: Interest Rate measurement (Mid term I)

Part II: Valuation of annuities (Mid term II)

Part III: Loans, bonds and funds (Final)

Interest is

Cost of borrowing money

The return on investment for saving money

The amount of interest depends on:

Principal (initial amount)

Interest rate

Time period

Way of quoting interest rate:

As percentage / 10%

decimal 0.1

Simple setup:

Principal: P

Interest rate: i

Time = t

Amount of interest charged:

Amount borrowed × interest rate for the period

Interest rate for period = $\frac{\text{Amount of interest}}{\text{Principal}}$

Effective rate of interest:

is the interest earned at the end of a period by an investment of one unit made at beginning of period.

Quoting separate interest rate for every period is impractical.

Simple interest rate:

Interest: $i \times t$

Total amount: Principal + Interest = $1 + i \times t$

Principal: P

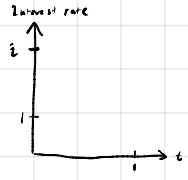
Interest earned: $i \times t \times P$ = Interest × Principal

Total Pay Back: $P \times (1 + i \times t)$

Annual interest rate to daily interest rate:

$P \times (1 + i \times t) \Rightarrow P \times (1 + \frac{d}{365} \times i)$, where $t = \frac{d}{365}$ (variation by rules)

from unit of year to date



Compound interest rate:

Total Pay Back = $P \times (1 + i)^{\frac{d}{365}}$