Reading 1 Concept Map

How Modules 1.1 & 1.2 Connect

MODULE 1.1 · RATES OF RETURN

What can earn a return?

Financial **assets** · Financial **instruments** · Financial **indicators** (no cash flows)

SINGLE PERIOD

Price return = $(P_1 - P_0)/P_0$

Distribution return = Income/P_0

Total return = sum (HPR)

Ex post (actual) vs ex ante (expected)

Realized vs unrealized

Expected − actual = risk.

MULTIPLE PERIODS

Arithmetic mean: simple average

Geometric mean: compound rate

Geometric ≤ arithmetic; gap grows with variability

−25% then +25% → arithmetic 0%, geometric −3.175%

ANNUALIZING

$(1 + r)^{365/days} - 1$

$(1 + r)^{c} - 1$, c = periods per year

Root by **periods** for per-period mean; by **years** for annual return

Assumes the return repeats.

CONTINUOUS COMPOUNDING

$R_{cc} = \ln(1 + r) = \ln(end/begin)$

$\ln(1.20) = 18.232\%$

Continuous returns are **additive** across periods

More frequent compounding → lower PV

MODULE 1.2 · COMPONENTS AND MEASURES OF RETURN

Now ask: what return should investors require, and how do costs, taxes and leverage change it?

REQUIRED RATE OF RETURN

Interest rate = required return = discount rate = opportunity cost of consumption

Required return = risk-free rate + risk premium

Nominal r_f = real r_f + inflation premium (T-bills)

RISK PREMIA

Bonds: default, liquidity, maturity

Stocks: size, value

Market risk premium = market return − risk-free (used later in CAPM)

MEASURES OF RETURN

Real: (1 + nominal)/(1 + inflation) − 1

Excess: vs a benchmark

Gross (after trading costs) → **Net** (after fees)

After-tax: tax each component

Leveraged: magnifies gains and losses

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