Finance Formula Sheet by Lecture

# Lecture 1: Overview Topics

No specific formulas, this lecture introduces major concepts.

# Lecture 2: Time, Money, and Interest Rates

Future Value (FV): FV = PV × (1 + r)^n

Present Value (PV): PV = FV / (1 + r)^n

Present Value of Annuity: PV = C × [1 - (1 + r)^-n] / r

Future Value of Annuity: FV = C × [(1 + r)^n - 1] / r

Perpetuity: PV = C / r

Effective Annual Rate (EAR): EAR = (1 + APR/m)^m - 1

Annual Percentage Rate (APR): APR = r × m

# Lecture 3: Investment Decision Rules

Net Present Value (NPV): NPV = ∑ [C\_t / (1 + r)^t] - C\_0

Internal Rate of Return (IRR): Solve NPV = 0 for r

Payback Period: Years to recover initial investment (non-discounted)

Profitability Index (PI): PI = PV of Future Cash Flows / Initial Investment

# Lecture 4: Capital Budgeting

Free Cash Flow (FCF): FCF = EBIT × (1 - Tax Rate) + Depreciation - CapEx - ΔNWC

Net Present Value (NPV): NPV = ∑ [FCF\_t / (1 + r)^t] - Initial Investment

# Lecture 5: Valuing Bonds

Bond Price = ∑ [Coupon / (1 + r)^t] + [Face Value / (1 + r)^n]

Current Yield = Annual Coupon / Bond Price

Yield to Maturity (YTM): Solve for r in bond pricing formula

Yield Spread = YTM - Risk-Free Rate

# Lecture 6: Valuing Stocks

Dividend Discount Model (DDM): P\_0 = D\_1 / (r - g)

Total Payout Model: P\_0 = PV(Total Dividends + Repurchases) / Shares Outstanding

Discounted Free Cash Flow Model: Firm Value = ∑ [FCF\_t / (1 + WACC)^t]

Comparable Valuation: Use P/E, EV/EBITDA, P/B, P/S ratios

# Lecture 7: Capital Markets and Pricing of Risk, CAPM

Expected Return: E(R) = ∑ p\_i × R\_i

Portfolio Expected Return: E(R\_p) = ∑ w\_i × E(R\_i)

Portfolio Variance: σ²\_p = ∑∑ w\_i × w\_j × Cov(R\_i, R\_j)

CAPM: E(R\_i) = R\_f + β\_i × (E(R\_m) - R\_f)

Beta: β\_i = Cov(R\_i, R\_m) / Var(R\_m)

# Lecture 8: Forwards, Futures, and Options

Forward Price: F = S × e^(rT)

Put-Call Parity: C - P = S - K × e^(-rT)

Call Option Payoff: max(S - K, 0)

Put Option Payoff: max(K - S, 0)