Equity Investments

Cheat Sheets

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Equity Investments

MARKET ORGANIZATION AND STRUCTURE

Initial Margin Requirement

$$\text{Initial Margin Requirement} = \frac{\text{Value of Equity Position}}{\text{Value of Investment Position}}$$

Leverage Ratio

$$\text{Leverage ratio} = \frac{1}{\text{Initial Margin Requirement}}$$

1 = 100%
Initial margin requirement = x%

Margin Call Price

$$\text{Margin call price} = P_0\left(\frac{1 - \text{Initial margin requirement}}{1 - \text{Maintenance margin requirement}}\right)$$

P_0 = Initial purchase price

Option Positions and their Associated Underlying Risk Exposure

Type of Option	Option Position	Exposure to Underlying Risk
Call	Long	Long
Call	Short	Short
Put	Long	Long
Put	Short	Short

SECURITY MARKET INDEXES

Value of Price Return Index

$$V_{PRI} = \frac{\sum_{i=1}^{N} n_i P_i}{D}$$

V_{PRI} = Value of the price return index
n_i = Number of units of constituent security *i* held in the index portfolio
N = Number of constituent securities in the index
P_i = Unit price of constituent security *i*
D = Value of the divisor

Price Return of an Index

$$PR_I = \frac{V_{PRI1} - V_{PRI0}}{V_{PRI0}} = \sum_{i=1}^{N} w_i PR_i = \sum_{i=1}^{N} w_i \left(\frac{P_{i1} - P_{i0}}{P_{i0}}\right)$$

V_{PRI1} = Value of the price return index at the end of the period
V_{PRI0} = Value of the price return index at the beginning of the period
PR_i = Price return of constituent security *i*
N = Number of individual securities in the index
w_i = Weight of security *i* (the fraction of the index portfolio allocated to security *i*)
P_{i1} = Price of constituent security i at the end of the period
P_{i0} = Price of constituent security i at the beginning of the period

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Total Return of an Index

$$TR_I = \frac{V_{PRI1} - V_{PRI0} + I}{V_{PRI0}} = \sum_{i=1}^{N} w_i TR_i = \sum_{i=1}^{N} w_i \left(\frac{P_{1i} - P_{0i} + Inc_i}{P_{0i}} \right)$$

TR_I = Total return of the index portfolio
V_{PRI1} = Value of the price return index at the end of the period
V_{PRI0} = Value of the price return index at the beginning of the period
Inc_i = Total income (dividends and/or interest) from all securities in the index held over the period
TR_i = Total return of constituent security *i*
w_i = Weight of security *i* (the fraction of the index portfolio allocated to security *i*)
N = Number of securities in the index

Value of Price Return Index
(Multiple periods)

$$V_{PRIT} = V_{PRI0}(1 + PR_{I1})(1 + PR_{I2}) \ldots (1 + PR_{IT})$$

V_{PRI0} = Value of the price return index at inception
V_{PRIT} = Value of the price index at time *t*
PR_{IT} = Price return on the index over period *t*, *t = 1, 2, ..., T*

Value of Total Return Index
(Multiple periods)

$$V_{TRIT} = V_{TRI0}(1 + TR_{I1})(1 + TR_{I2}) \ldots (1 + TR_{IT})$$

V_{TRI0} = Value of the index at inception
V_{TRIT} = Value of the total return index at time *t*
TR_{IT} = Total return on the index over period *t*, *t = 1, 2, ..., T*

Price Weighting

$$w_i^P = \frac{P_i}{\sum_{i=1}^{N} P_i}$$

w_i = Weight of security *i*
P_i = Share price of security *i*
N = Number of securities in the index

Equal Weighting

$$w_i^E = \frac{1}{N}$$

w_i = Weight of security *i*
N = Number of securities in the index

Market-capitalization Weighting

$$w_i^M = \frac{Q_i P_i}{\sum_{j=1}^{N} Q_j P_j}$$

w_i = Weight of security *i*
Q_i = Number of shares outstanding of security *i*
P_i = Share price of security *i*
N = Number of securities in the index

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Float-adjusted Market-capitalization Weighting	$w_i^M = \frac{f_i Q_i P_i}{\sum_{j=1}^{N} f_i Q_j P_j}$	**f_i =** Fraction of shares outstanding in the market float **w_i =** Weight of security *i* **Q_i =** Number of shares outstanding of security *i* **P_i =** Share price of security *i* **N =** Number of securities in the index
Fundamental Weighting	$w_i^F = \frac{F_i}{\sum_{j=1}^{N} F_j}$	**w_i =** Weight of security *i* **F_i =** Fundamental size measure of company i
Return on Equity	$ROE_t = \frac{NI_t}{Average\ BVE_t} = \frac{NI_t}{(BVE_t + BVE_{t-1})/2}$	**NI_t =** net income in year t **BVE_t =** beginning total assets minus beginning total liabilities
Dividend Discount Model	$V_0 = \sum_{t=1}^{n} \frac{D_t}{(1+r)^t} + \frac{P_n}{(1+r)^n}$	**V_0 =** value of a share of stock today (t = 0) **D_t =** expected dividend in year t (at the end of the year) **r =** required rate of return **P_1 =** the expected price/share at t = 1
Free Cash Flow to Equity	**FCFE = CFO – FCInv + Net borrowing**	**FCInv =** Fixed Capital investment **CFO =** Cash Flow from Operations **Net Borrowing =** amount borrowed minus amount repaid
FCFE Mode	$V_0 = \sum_{t=1}^{\infty} \frac{FCFE_t}{(1+r)^t}$	**FCFE =** Free Cash Flow to Equity **r =** Required rate of return

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Float-adjusted Market-capitalization Weighting	$k_i = R_f + \beta_i [E(R_m) - R_f]$	**k_i =** The required rate of return (k_i) for security i **β_i =** The return sensitivity of stock **i** to changes in the market return **$E(R_m) - R_f$ =** The expected market risk premium **$E(R_m)$ =** The expected return on the market **R_f =** Risk-free rate
Intrinsic Value of Preferred Stock	$V_0 = \frac{D_t}{r}$	**D_t =** Expected dividend in year t (at the end of the year) **r =** Required rate of return
Gordon Growth Model	$V_0 = \frac{D_0(1+g)}{r-g} = \frac{D_1}{r-g}$	**V_0 =** Value of a share of stock today, at t = 0 **D_0 =** The current stock dividend **r =** Required rate of return on the stock **g =** Constant dividend growth rate
Dividend Growth Rate	$g = \left(1 - \frac{D}{EPS}\right) \times ROE$	$\frac{D}{EPS}$ = Dividend payout ratio **ROE** = Return on Equity **EPS =** Earnings per Share
Two-stage Dividend Discount Model	$V_0 = \sum_{t=1}^{n} \frac{D_0(1+g_s)^t}{(1+r)^t} + \frac{V_n}{(1+r)^n}$ $V_n = \frac{D_n + 1}{r - g_L}$ $D_{n+1} = D_0(1+g_S)^n(1+g_L)$	**g_s =** Short-term growth rate **r =** Required rate of return

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Justified Forward P/E	$\frac{P_0}{E_1} = \frac{D_1/E_1}{r-g} = \frac{p}{r-g}$	**p =** Expected dividend payout ratio **r =** Required rate of return **g =** Expected dividend growth rate
Price/Book Ratio	$Price/Book\ Ratio = \frac{Market\ price\ per\ share}{Book\ value\ per\ share}$	Helps investors assess the relative value of a company's stock.
Price/Sales (P/S) ratio	$\text{P/S} = \frac{\text{Price per share}}{\text{Sales per share}}$	The price that investors are willing to pay per $1 of sales
Price/Cash Flow (P/CF)	$Price/Cash\ Flow\ (P/CF) = \frac{Share\ price}{Cash\ flow\ per\ share}$	The price an investor needs to invest to obtain $1 of a company's cash flow.
EV/EBITDA Ratio	$\text{EV/EBITDA} = \frac{Enterprise\ value}{Earnings\ before\ interest, taxes, depreciation, and\ amortization\ (EBITDA)}$ $EV\ (Enterprise\ value)$ $= Market\ value\ of\ equity + Market\ value\ of\ debt$ $+\ Market\ value\ of\ preferred\ stock - Cash\ and\ cash\ equivalents$	


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