

Study Session 10

Valuation Concepts



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Valuation Concepts

- **A Note on Asset Valuation**
- **Equity Valuation: Applications and Processes**
- **Equity: Markets and Instruments**
- **Return Concepts**

Valuation Concepts

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Valuation Concepts

- **A Note on Asset Valuation**

Valuation Concepts

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Note on Asset Valuation

Graham and Dodd 1934–1962

- **Main contribution:** Recognition of the need for detailed financial statement analysis and focus on **earnings power**
- Growth prospects should be considered
- Forerunner of relative valuation methods such as P/E, P/S, and so forth
- Established the *blocking and tackling*

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Note on Asset Valuation

John Burr Williams (1938)

- **Main contribution:** Intrinsic value = present value of cash flows at an *opportunity cost of capital*
 - Discount rate was not clearly defined
- Basis for dividend discount model and free cash flow models

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Equity Valuation: Applications and Processes

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Equity Valuation

Equity Valuation

Intrinsic Value (IV): True underlying value of the security given complete understanding

Estimated Value (VE): Investor estimate of intrinsic value

Market Price (P): Current price

Two Sources of Perceived Mispricing:

$$VE - P = (IV - P) + (VE - IV)$$

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Equity Valuation

Other Value Concepts

- **Going Concern Value:** Typically the relevant intrinsic value for publicly traded companies; assumes assets remain in place and continue to produce cash flow into the future via continuing operations
- **Liquidation Value:** The value if the firm ceases to operate, all assets are sold, and the firm is dissolved
- **Orderly Liquidation Value:** Assumes adequate time to realize liquidation value

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Equity Valuation

Uses of Equity Valuation

1. **Stock selection—our focus**
2. Inferring inputs from the market vs. history
3. Projecting worth of company actions
4. Fairness opinions for mergers
5. Planning and consulting—max. s/h value
6. Communication with investors
7. Valuing private business
8. Portfolio management

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LOS 35.d , CFAI Vol.4 p.16 Equity Valuation

Porter's Elements of Industry Analysis

1. Intra-industry rivalry
2. New entrants
3. Substitutes
4. Supplier Power
5. Buyer Power

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Porter's Elements of Competitive Strategy

1. Cost leadership – lowest cost producer
2. Differentiation – unique products or services
3. Focus – target segment(s) of industry using either of the above strategies

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Equity Valuation

Evaluating the Quality of Financial Statement Information is Important

Revenue Recognition and Gains

- Early revenue recognition
- Misclassification of non-operating income

Expenses and Losses

- Too little or too much reserves
- Inappropriate capitalization of expenses

Off-Balance Sheet Financing – understate liabilities

Operating Cash Flow – may be artificially inflated

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Equity Valuation

Absolute vs. Relative Valuation

Absolute valuation models:

- Intrinsic value based on fundamental characteristics—EPS, asset turns and leverage, return on equity, growth (g)
- (e.g., DDM, free cash flow, residual income)

Relative valuation models:

- Value derived from relative comparison to similar assets, based on law of one price
- P/E, P/B, P/CF, P/S models

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Appropriate Valuation Approach

Consistent with characteristics of company

- Understand the company and how its assets create value

Based on quality and availability of data

- DDM problematic when no dividends
- P/E problematic with highly volatile earnings

Consistent with purpose of analysis

- Free cash flow vs. dividends for controlling interest

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Wrap Up: Equity Valuation Process

- Model suitability
- Quality of the inputs—financial statement analysis, footnotes
- Absolute versus relative valuation

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Equity: Markets and Instruments

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Equity: Markets and Instruments

The Origins of Market Organizations

Modern stock exchanges evolved from:

- **Private bourses:** British influence, private ownership, bias toward self regulation
- **Public bourses:** French influence, gov. appointed stock brokers
- **Banker's bourses:** Developed as a result of German Banking Act, which gave banks a monopoly in equity exchange markets

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Types of Markets: Order Driven

- Known as *auction markets*
 - Prices determined by public orders to buy and sell
- No active market makers
 - All traders publicly post their orders
 - Price determined by directly matching supply and demand via central order book
- **Examples:** Paris, Tokyo, and Frankfurt

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Advantages of Order-Driven Markets

- **Traders view all standing orders**
 - Monitor liquidity via supply and demand
- **Automated systems provide high-speed, low-cost trading**
 - Little human intervention
 - Efficient for low trade volume securities

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Disadvantages/Risk of Order-Driven Market

- Inability to execute large trades
 - Lack of market depth
 - Long time lag

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Price Driven Markets

- **AKA:** Dealer market
- Market maker maintains inventory and quotes bid (buy) and ask (sell) prices
 - Competition among many market makers promotes the best prices
 - No centralized book of order limits
- Example: U.S. NASDAQ market

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Advantages of Price-Driven Market

- Purchases made at lowest offering price and sales occur at highest bid price
- More efficient for large block trades
- Competition between dealers leads to tighter bid-ask spreads

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Risks/Disadvantages of Price-Driven Market

- No centralized book of limit orders
- Market maker suffers from loss of anonymity

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International Investment: Tax Implications

- **Taxes assessed by:**
 - Investor's country
 - Local country (corporation's country)
- **Three general forms of tax:**
 - Transaction
 - Capital gain
 - Income
- **Key point:** All taxes reduce total return

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Equity: Markets and Instruments

Pre-Tax vs. After-Tax Returns

$$\text{Gross (pre-tax) Return} = \frac{P_1 - P_0 + \text{Div}_1}{P_0}$$

Just an HPR!

$$\text{Net (A-T) Return} = \frac{P_1 - P_0 + \text{Div}_1 - \text{CG Tax} - \text{Inc Tax} - \text{other taxes}}{P_0}$$

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Equity: Markets and Instruments

Impact of Taxes on International Stock Ownership Returns

- **Capital gains:** Taxed in the country where the stockholder resides
- **Dividend income:** Can be taxed by both governments
 - Conflict in tax jurisdiction/double taxation
 - Investor receives:
 1. Dividend income net of withholding tax
 2. Tax credit (applied against home country taxes)

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Example: Different National Taxes

- **U.S. investor buys:**
 - 100 shares of Nokia in Finland
 - Shares cost €13.50 each (total outlay = €1,350)
 - Exchange rate is \$0.88 per Euro (constant)
 - USD cost is \$1,188 (i.e., $.88 \times €1,350$)
- **Three months later:**
 - Nokia pays a dividend of €0.50
 - Investor immediately sells shares for €15.00

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Equity: Markets and Instruments

Example: Different National Taxes

- Tax environment:
 - 10% withholding on dividends (in Finland)
 - U.S. taxes on dividends = 15%
 - U.S. taxes on ST capital gains = 28%
- **Calculate:**
 - Pre-tax (gross) return
 - After-tax (net) return

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Example: Different National Taxes

Capital Gains:

- U.S. dollar proceeds from sale
 $= €15.00 \times 100 \times \$0.88/€ = \$1,320$
- Pre-tax Capital Gain
 $= \$1,320 - \$1,188 = \$132$
- CG taxes paid to U.S. authority
 $= \$132 \times 0.28 = \underline{\$36.96}$

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Example: Different National Taxes

Dividends:

- Pretax dividends
= $€0.50 \times 100 \times \$0.88 / € = \$44.00$
- Taxes paid to U.S. authority
= $\$44.00 \times 0.15 = \6.60
- Tax withholding in Finland
= $\$44.00 \times 0.10 = \4.40

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Example: Different National Taxes

Dividends:

- Gross dividend declared in USD = \$44
 - Taxed at 15% marginal rate
 - Total U.S. tax = \$6.60 (i.e., $0.15 \times \$44$)
- **U.S. tax credit = \$4.40**
 - From 10% Finnish withholding tax
 - **Point:** Dollar for dollar reduction in U.S. tax
- **Paid to U.S. tax authority: \$2.20**
 - Total tax of \$6.60 minus \$4.40 foreign tax credit

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Example: Different National Taxes

- **Total pre-tax return**
= $(\$132 + \$44) / \$1,188 = \underline{14.8\%}$
- **After CG tax of \$36.96 and div tax of \$6.60:**
= $(\$95.04 + \$37.40) / \$1,188 = \underline{11.1\%}$
- **Impact of taxes on total return**
= $14.8\% - 11.1\% = 3.7\%$
 - **25% reduction in total return!**

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Components of Execution Costs

- **Tangible or explicit** trading costs:
 - **Commissions, fees, and taxes**
- **Intangible** trading costs:
 - **Market impact:** Impact of purchasing liquidity, cost of rushing orders
 - **Opportunity costs:** Cost of delay, patience or failure to complete trade
 - **Note:** Trade-off exists between market impact and opportunity costs

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Equity: Markets and Instruments

7 Ways of Reducing Execution Costs

- 1. Program trading:** Trade basket of securities rather than individual securities
 - Adv: Reduces risk with diversification
 - Dis: Time consuming to find counterparty
- 2. Internal crossing:** Match a buy for one client and a sell for another within firm
 - Adv: Minimizes execution costs
 - Dis: Relatively rare to have immediate match available within firm, difficult to ensure fair price

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Equity: Markets and Instruments

7 Ways of Reducing Execution Costs

- 3. External crossing:** Use electronic crossing network, ECNS
 - Adv: Low costs and anonymous trade
 - Dis: Opportunity cost if order grows stale
- 4. Principal trades:** Principal acts as dealer
 - Adv: Liquidity assured lowering opportunity costs
 - Dis: Not anonymous, total execution costs can be higher because of price exposure resulting from inventory position

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Equity: Markets and Instruments

7 Ways of Reducing Execution Costs

5. **Agency trades:** Brokers find buyers and negotiates the trade for the client
 - Adv: Hope to achieve best execution with low opportunity cost but higher price impact
 - Dis: Large commission, anonymity not assured

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Equity: Markets and Instruments

7 Ways of Reducing Execution Costs

6. **Futures contracts:** Buying and selling contracts on a market index while selling and buying securities
 - Adv: Low opportunity cost, highly liquid
 - Dis: Basis and rollover risk
7. **Indications of interest:** Survey of dealers, "Upstairs" trades
 - Adv: Low execution costs
 - Dis: Less anonymity

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Equity: Markets and Instruments

American Depository Receipts (ADRs)

- **ADR:** Dollar-denominated certificate representing ownership in a foreign firm
 - Traded like stocks
 - Indirect ownership of foreign equities
- **Lower administrative costs**
- **Increases international diversification**
- Does **not eliminate currency risk** or economic risk

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Equity: Markets and Instruments

Types of Sponsored ADR Issues

- **Level I**
 - OTC traded: Not required to comply with SEC registration and listing requirements
- **Level II**
 - Exchange traded: Must meet SEC registration and listing requirements
- **Level III**
 - Exchange traded: May float a security offering on U.S. exchange in order to raise capital

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Equity: Markets and Instruments

Why Firms List Abroad?

- **Pros:**
 - International diversification of capital base
 - Minimizes domestic takeover threats
 - Raise additional capital
 - Increases international visibility/advertising
- **Cons:**
 - Can lead to higher price volatility

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Equity: Markets and Instruments

Compare ADRs vs. Listed Shares

- **ADRs provide international diversification:**
 - Easy investment in foreign firms
 - Limited availability
- **Listed shares:**
 - Cheaper than ADRs for institutional investors

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Equity: Markets and Instruments

Closed-End Country Fund

- **Closed-end funds:** Intermediary invests in stocks from a single country and sells IPO
 - Shares do NOT necessarily trade at NAV
- **Premium/discount determined by:**
 - Higher foreign investment restrictions premium
 - Higher management fees/lack of liquidity discount

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Equity: Markets and Instruments

Exchange-Traded Funds (ETF)

- **Characteristics**
 - Special open-ended funds whose holdings mirror an index
 - **Point:** Trade on an exchange like a stock
 - ETFs are shares of a portfolio not individual securities

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Equity: Markets and Instruments

Advantages of ETFs

- **Main Point:** International diversification with high liquidity and minimal cost
 - **Tax-efficient** (low portfolio turnover)
 - **Low cost structure**
- May be **shorted or margined**
- Suited for asset allocation strategies
- **Negative: *Stale pricing***—NAV unchanged when local market is closed

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Equity: Markets and Instruments

Alternatives to Direct Foreign Investing

1. **American Depository Receipt (ADR):**
 - **Adv:** Cost, access, diversification
 - **Dis:** Currency and economic risk, relatively few available for investment
2. **Closed-end country fund:**
 - **Adv:** Access, diversification
 - **Dis:** Premium or discount to NAV, correlated to U.S. equities → decreased diversification benefits

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Equity: Markets and Instruments

Alternatives to Direct Foreign Investing

Cont.

3. Open-end fund

- Adv: Trade at NAV, many choices
- Dis: Early redemption hour, time lag, no shorts or margin

4. ETFs

- Adv: Track index, margin/sell short, quick
- Dis: Management fees

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Equity: Markets and Instruments

Keys to the Exam

Equity: Markets and Instruments

- Types of execution costs
- ADRs, ETFs, and open vs. closed-end funds

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Return Concepts

Seven Return Concepts

1. **Holding period return (HPR)** — capital gains plus any cash flow stated as a percentage of the initial investment:
 - $HPR = (P_1 - P_0 + CF_1) / P_0$
 - HPR = Price appreciation + dividend yield
 - **You see this equation everywhere in CFA-land**
2. **Realized Return**—historical return based on observed prices and cash flows
 - **Can be calculated as an HPR**

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Return Concepts

Seven Return Concepts

3. **Expected Return**—return based on forecasts of a future price and cash flows
 - **Think:** forecast return
4. **Required Return**—the minimum return an investor requires given the asset’s risk
 - Frequently calculated with the CAPM
5. **Return from Convergence**—return expected/realized as market price converges to intrinsic value

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Return Concepts

Seven Return Concepts

6. **Discount rate**—rate used to determine the present value of an investment
7. **Internal Rate of Return (IRR)**—the rate that equates the discounted cash flows to the current market determined price
 - Again, **you see this calculation frequently** in CFA-land (capital budgeting, YTM, cash flow yield, etc.)

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Equity Risk Premium (ERP)

- **Equity Risk Premium**—additional return above the risk-free rate investors require for holding (risky) equity securities
 - **Think:** Required return – RFR
- The risk-free rate should be equal to the investor’s investment horizon
 - T-Bills for short horizons
 - T-Bonds for longer holding periods

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Equity Risk Premium (ERP)

- **Required Return for a Stock**
 - The ERP can be used to determine the required return for an individual security given its level of systematic risk

$$R_i = R_f + \beta (R_M - R_f)$$

Risk-free rate
Average equity risk premium
Beta (systematic risk)

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Return Concepts

Strengths and Weaknesses of Approaches to Estimating the ERP

1. **Historical ERP**—historical mean difference between broad market equity index and T-bill
 - **Strength**—objective and simple
 - **Weaknesses:**
 - Assumes stationary of mean and variance of returns over time
 - Upwardly biased due to survivorship bias
 - Which risk-free rate to use?

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Return Concepts

Strengths and Weaknesses of Estimating the ERP

2. **Forward Looking ERP**—utilizes current market conditions and expectations concerning economic and financial variables
 - **Strength**—does not require stationarity
 - **Weaknesses:**
 - Requires frequent updates
 - Makes lots of assumptions

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Strengths and Weaknesses of Estimating the ERP

3. **Macroeconomic Model**—use macroeconomic and financial variables such as inflation, earnings growth, and so forth
 - **Strength**—robust results
 - **Weakness**—used only with developed countries
4. **Survey**—consensus of experts
 - **Strength** – easy to obtain
 - **Weakness** – wide disparity between opinions

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CAPM: Single Factor Required Return on Equity Model

- **Capital Asset Pricing Model (CAPM)**

Risk-free rate

Expected equity risk premium

$$R_i = R_f + \beta (R_M - R_f)$$

Beta (systematic risk)

Single Factor Model

Example: $R_f = 4\%$, $ERP = 3.9\%$, $\beta = 0.8$, then:
 Req. return = $4 + 0.8(3.9) = 7.12\%$

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Return Concepts

Multifactor Models of Required Return

- **Multifactor Models:** Use multiple *factors* to explain returns
- **Required return = $R_f + RP_1 + RP_2 + \dots + RP_n$**
 - Where $RP =$ Risk premium = (sensitivity) \times (**factor**)
- **Factor sensitivity**—asset's sensitivity to a factor
 - **Think:** Beta (the one sensitivity in the CAPM)
- **Factor risk premium**—return driver
 - Think: ERP (the single factor in the CAPM)

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Return Concepts

Multifactor Models of Required Return

- **Two types of models**
- Arbitrage models
 - Fama-French
 - Pastor-Stambaugh
 - Arbitrage Pricing Model (BIRR version)
- Ad hoc model
 - Build-up (i.e., bond yield + risk prem)

All are very easy to implement – inputs given on exam!

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Return Concepts

Various Required Return on Equity Models

- **Fama-French Model Example:**

- Risk-free rate of 3%
- **Small Cap** factors and sensitivities

	Factor	Sensitivity
<i>(Market index – R_f)</i>	5%	1.1
<i>(Small – Big) returns</i>	3%	0.4
<i>High B/M – Low B/M</i>	2%	– 0.8

$$R_i = 3\% + 1.1(5\%) + 0.4(3\%) - 0.8(2\%) = \mathbf{8.1\%}$$

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Solution

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Return Concepts

Various Required Return on Equity Models

- **Pastor-Stambaugh Model**—adds a liquidity factor to the Fama-French Model

	Factor	Sensitivity
<i>(Market index – R_f)</i>	5%	1.1
<i>(Small – Big) returns</i>	3%	0.4
<i>High B/M – Low B/M</i>	2%	– 0.8
<i>Liquidity Premium</i>	4%	– 0.1

$$R_i = 3\% + 1.1(5\%) + 0.4(3\%) - 0.8(2\%) - 0.1(4\%) = \mathbf{7.7\%}$$

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Various Required Return on Equity Models

- **Arbitrage Pricing Model:** Competitor to CAPM
 - Factors not specified
- **BIRR version is closest** to *accepted* factors:
 1. Investor confidence risk
 2. Time horizon risk
 3. Inflation risk
 4. Business-cycle risk
 5. Market-timing risk

Do not memorize

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Various Required Return on Equity Models

- **Assume:**
 - Risk-free rate of 3%
 - **Using three** factors and sensitivities

	Factor	Sensitivity
<i>Investor confidence risk</i>	2%	1.1
<i>Time horizon risk</i>	4%	1.2
<i>Inflation risk</i>	3%	0.8

$R_i = 3\% + 1.1(2\%) + 1.2(4\%) + 0.8(3\%) = \mathbf{12.4\%}$

Solution


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Return Concepts

Various Required Return on Equity Models

- **Build Up Method**
 - Used with closely held companies
 - Used when beta estimates *unobtainable*
 - $E(r) = R_f + ERP + \text{size premium} + \text{company specific premium}$
- Inputs will be given
- Method does not use betas! 


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Return Concepts

Beta Estimation: Public Firms

- **Public company betas:** Estimated with regression
 - Regress the company's returns on the returns of the overall market index
 - $R_{\text{company}} = \alpha + \beta (R_{\text{market}})$ 
 - Index choice: S&P 500
 - Interval: Five years, monthly data
- Beta drift: Observed tendency of a computed beta to migrate towards 1.0

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Return Concepts

Beta Estimation: Thinly Traded and Nonpublic Firms

- **Four-step procedure** (called a *pure play*)
 1. **Identify a publicly traded firm** with similar industry characteristics
 2. **Estimate the beta** of the publicly traded firm using regression (last slide) → B_E
 3. **Unlever the beta** $B_{unlevered} = [1/(1+(D/E_{comp.firm}))]B_E$
 4. **Relever beta** $B_{nonpublic} = [1+(D/E_{nonpublic})]B_{unlevered}$

D/E ratio of the nonpublic firm

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Return Concepts

Strengths and Weaknesses of the Required Rate of Return Approaches

- **CAPM**—simple, easy to compute, single factor model
 - Simplicity comes with potential loss of explanatory power
- **Multi-factor models**—higher explanatory power
 - More complex and expensive
- **Build up**—simple
 - Ad hoc and uses historical values

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Return Concepts

International Considerations in Required Return Calculations

- **Exchange rates**—compute the required return in the home currency and adjust it by the forecast for the change in the exchange rate
- **Emerging market premium**—use a developed market benchmark and add an emerging market premium

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Return Concepts

Weighted-Average Cost of Capital

- Weighted average of rates of return required by capital suppliers (WACC):

$$WACC = (w_e \times r_e) + [w_d \times r_d \times (1-t)]$$

Required returns
 ↓ ↘
MV weights OR target weights

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Return Concepts

Pairing of Discount Rate With Cash Flows

Know!

- Firm value = FCFF, discount at WACC
- Equity value = FCFE, discount at R_E
 - Use FCFE when capital structure are not volatile
 - Use FCFF with high debt levels, negative FCFE
- Equity value = firm value – MV of debt

Big Point: You must align the discount rate with the cash flows!

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Return Concepts

Keys to the Exam

Return Concepts

- Seven Return Concepts
- Estimating the Equity Risk Premium
- CAPM, Fama-French, and related models
- Beta estimation
- WACC

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