
Derivatives / Slope: measure of risk

- Slope: Regression (line of best fit)
- Duration: 1st derivative (calculus) → demonstrates sensitivity to slope (bond risk)
  - We want the 1st derivative to be 0
- Convexity: change in slope (bond risk)
- Call Option: right to buy underlying asset at stock (exercise) price on future date (expiry)
  - Option Risk
    - Option Theta
    - Option Rho
    - Option Vega
- Takeover Target: stock price increases
- CAPM: percentage change in s for percentage change in market
    - CAPM: uses beta to calculate expected return on an asset
  - Beta: measures risk (measures slope)
  - Beta: Volatility of an asset in relation to the volatility of the benchmark
  - Match the volatility of the benchmark = 1, less volatile than the benchmark: <1, more volatile than the benchmark: >1

Investment Philosophy Objective (IPO):

- Strategies: Top-Down & Bottom-Up
  - **Top-Down:** Look at economy as a whole, then look at companies (financials)
  - **Bottom-Up:** Look at companies (financials), then look at economy as a whole

Asset Allocation:

- Long-Term Recommendation: 70 (equity) / 30 (fixed)
  - Equity: Stocks, ETFs, etc.
  - Fixed: Bonds (ETFs?), Money Market, etc.
- Sector Weights (11) – Cyclical, Defensive, Sensitive:

CYCLICAL (SEASONAL): Highly sensitive to business cycle peaks & troughs (boom & bear markets) – perform strongly during strong economic growth, & poorly during economic recessions

1. **Financials**
   a. Investment banks, Commercial banks, Insurance Companies, Financial service providers, Asset management companies, Financial brokers
   b. Ex.: V, JPM, BAC
2. **Consumer Discretionary (Cyclical)** – Not Necessity
   a. Retail, Ecommerce (buying/selling electronically), Hotel, Luxury goods (Cars), Travel industries
   b. Ex.: AMZN, TSLA, HD + LULU (Retail)
3. **Materials**

    a. Construction, chemicals, paper, & glass materials, metals & mining companies
    b. Ex.: DD, SHW
4. **Real Estate**
    a. Real estate property + REITs (companies invest into hotels, office buildings)
    b. Ex.: AMT, SPG

DEFENSIVE: Anti-Cyclical / Non-Seasonal – perform fairly consistently (regardless of broader macroeconomic conditions)

5. **Health Care** (Necessity)
    a. Pharmacy producers, medical devices, healthcare service providers, biotech stocks, insurance companies
    b. Ex.: UNH, PFE
6. **Consumer Staples (Defensive)** – Necessity:
    a. Personal products: toothpaste, deodorant
    b. Household items: clothing, foods
    c. Household goods: foods, beverages, tobacco products
    d. Ex.: WMT, PG, KO
7. **Utilities** (Necessity)
    a. Electricity, gas, water
    b. Ex.: NEE, DUK, SO

SENSITIVE: Moderate correlation with business cycles

8. **Technology**
    a. Artificial Intelligence & Semi-Conductors
    b. Software / Hardware providers
    c. Internet stocks & Cloud computing
    d. Ex.: AAPL, MSFT, AMZN
9. **Communication (Consumer) Services** – TELECOM:
    a. Wireless Telecom networks
    b. Media, Entertainment, Internet companies (TV, radio)
    c. Ex.: GOOG, T
10. **Industrials**
    a. Industrial machinery, construction, & engineering
    b. Aerospace & defense
    c. Electrical equipment
    d. Ex.: BA, HON, UNP
11. **Energy**
    a. Oil, natural gas
    b. Ex.: XOM, CVX

★ Buy companies with best pricing power (CF increase easily)

- Vice versa: Underweight sectors with CF that have hard time of being increased by pricing power
    - Ex.: Utility Sector (Defensive sector)

Coupon payment = coupon rate x par value

- Coupon bonds & capital gains:
    - What's more risky, 1 yr coupon bond or 2 yr coupon bond?
    - 2 yr coupon bond: more time to be sensitive to changes in interest rates
- Zero-coupon bond: buy at discount, paid off in maturity (face value is repaid over time & by maturation)
- Duration for coupon bonds: Weighted average of the times until fixed CFs are received. In summary, it's the weighted term of future CFs.

CF for Bonds: Interest payments
CF for Stocks: Dividends

- Stocks are riskier than bonds due to the stocks residual (stockholders receive a residual)
- Bondholders get paid first (vs Stockholders)
    - Company has to pay workers, then taxes, then Bondholders

Diversifiable (Unsystematic) Risk:
Non-Diversifiable (Systematic) Risk:

- Currently (as of 9/15): Treasury bills (risk-free) are paying 3.63% (1-yr) & the 10-yr yield is 4.01%
- So, why obtain risk that incorporates potential default, a premium, etc.!

John C. Vogel: created Vanguard in 1975; the world's 1st index fund

- Suggests a ceiling of 80% stocks & a floor of 25%
- (Benjamin) Graham's 75/25 (maximum) & 25/75 (minimum) asset allocation still holds for investors today
- Book Summary: Zero-sum game (index investing – passive investing)
- Use portfolio optimization for the asset allocation for clients

Direct Investing:

- Money Market Instruments:
    - Short-term (less than 1 year) debt instruments sold by government, firms, & financial institutions.
    - Wide range of trading activity / liquidity.
        - Liquidity: how easily assets are able to convert into cash at the FMV

Growth Stock vs Value Stock

- Growth Stock: High P/E Ratio – grows faster than the industry average / grows too fast for the economy to keep up
- Value Stock: Low P/E Ratio (low price to sales ratio)
    - In the long-run, Value stocks have outperformed Growth stocks

Put Option: Great for downside risk!
- Buy cheap today, lose -100% every year until market goes into recession. Then, if market goes down -25%, you may be up +500%. So, when everyone else's portfolio is losing, you're still gaining.

Diversification: linear / weighted relationship of portfolio!
- This is a more sophisticated definition than simply "putting your eggs all in one basket"

Risk:
- 2^2 = 4 (Increases portfolio risk)
- 0.5^2 = 0.25 (Decreases portfolio risk)

You only earn returns on non-diversifiable risk (systematic risk)
- Market Portfolio (hold all assets)

★ Statistics allows investors to better estimate weights in a portfolio
    - Variance-Covariance Matrix

- Value v Growth Stocks
    - Historically, value stocks have outperformed growth stocks in the U.S.
    - However, due to the recent surge (bullish market) in the technology sector (ex.: Nvidia), growth stocks have performed better than value stocks
- Leading Sectors & Lagging Sectors… why are certain sectors performing in such a way?
    - A Leading Sector → Technology
        - Due to certain companies within the sector becoming larger with massive market caps – apple, microsoft, amazon, etc.
    - A Lagging Sector → Real Estate
        - Although an increased interest rate over the past couple years has affected all sectors, it has impacted this sector the most. Higher interest rates have meant a higher cost of borrowing for REITs (real estate investment trusts).
            - Rate-sensitive sector

Black Swan Book: Doesn't follow traditional investing strategy, which considers historical data & trends. Instead, the book emphasizes the barbell investing strategy. This strategy serves to maximize profit & mitigate risk. So, you would invest in safer & more speculative investments (this will consist of a hefty amount within the portfolio).
- Ex.: Put Options (protects against downside risk)

The purpose of this book is to demonstrate that it is hard to predict events in the future – hence, why it is suggested to pick safer investments.

Stress Testing Value at Risk:
- Run simulations (Monte Carlo)

Value at Risk (VaR): assumes a normal distribution (Harry Markowitz)

Risk Budgeting for Optimization?

Yield to Maturity (YTM):

- This is the rate of return that we demand
- Bonds pay coupon payments semi-annually or annually (annual coupon vs semi-annual coupon)
- Premium bond (> $1,000 par value) vs discount bond (< $1,000 par value)
- If the coupon rate is less than the required rate, we aren't making enough money from the coupon rate. So, this would be a discount bond. Vice versa, if the coupon rate is greater than the required rate, this would be a premium bond.

Forward Rates (Forward Curve):

- The actual interest rates are the forward rates – bonds earn the forward rates, not the spot rates
- Is the forward rate the best predictor of interest rates in the future? YES!

3 ways to determine interest rates:

1. Spot Rates (y)
2. Forward Rates (f)
3. Discount Function (d)

Fundamental Analysis: Studying company financial statements (IS, RE, BS, CF)

- Goal of fundamental analysis → Search for securities trading at a discount to their true value
- Examines a company's financial statements (cash flows) & various micro & macroeconomic factors to help determine/quantify a security's intrinsic value
- Invest in quality companies with strong fundamentals, such as growth in earnings, competitive advantages (e.g., strong brands, innovative products), and robust management teams

Technical Analysis: Studying the stock's past (previous) movements (viewing charts, graphs)
Quantitative Investment Approach (Analysis):
Index Plus Investment Strategy:
Theme Investing: Ex.: AI, electric vehicles

Herd Behavior: Investors follow "the herd"

- As a result, this drives up the stocks' prices. So, investors then buy at an overpriced rate

Speculation (bitcoin – not real money): short-term trading
VS
Investments: made up of real cash flows

IPO: if our team wants to be active portfolio investors (vs passive), then we are basically referencing that the market is impractical

- Value investment philosophy: investing in undervalued assets (stocks), according to a company's EPS (earnings per share)... so, purchase stocks that are undervalued relative to their intrinsic worth (value)

Growth vs Value Stocks

- Value (Income) Stocks – reinvest dividends & tend to have low dividends, high P/E ratios
    - Older, mature companies with little growth (utilities)
- Growth Stocks – tend to grow faster than the industry whole (average)
    - Sales, earnings greater than industry average (no or low dividends)

Speculative stocks: high risk, high volatility

- Ex.: Medical devices

Return (in portfolio) = Beginning Value – Ending Value / Ending Value

- We will calculate our returns on a monthly basis using YTM (IRR)
- Need to understand how donations/withdrawals, buying/selling of investments, & dividends interact with the returns of the portfolio.

POTENTIAL STRATEGIES:

- (Active) Sector Rotation
- Sector Neutral (our team doesn't need to be "active" in every sector within the portfolio)

TO CONSIDER:

- Buy/Sell timing
- Market timing (do you want to time the market & look for arbitrage opportunities)
    - This is either active or passive (patient) investing – you are either 100% in or 100% out of the market
- Asset allocation
- Asset (security) selection
- Equity vs fixed allocation

According to the market portfolio, "you've seen 1 stock, you've seen them all"

- So, this is implying that all people should invest in the market portfolio then

- Beta (risk-reward measurement): measure of a stock's sensitivity of a portfolio's returns to market movements, indicating its systematic (non-diversifiable) risk.
- Alpha: measures a portfolio manager's ability to outperform a market index (benchmark = S&P500)
    - Alpha = Actual Return – Expected Return w/ risk-adjusted return taking into account beta
- Sharpe Ratio: indicates a portfolio's style analysis, showing its concentration in large cap, mid cap, & small cap markets
    - S&P 1500: Large cap (current benchmark for equity portion of APMP portfolio)

        - S&P 400: Mid cap
        - S&P 600: Small cap
    - P/E Ratio: value (income) vs growth stocks

Why buy stock on margin?
- Why does a firm issue debt? – to finance their operations

3 sections of the Statement of Cash Flows:
- Operating (most important)
- Investing
- Financing

Different types of valuation methods?

Levered beta vs Unlevered beta

Investment Strategies:
- Stock Picking
- Portfolio Management
- Market Timing

Investment Strategies RANKED:
1. Asset Allocation
2. Market Timing
3. Diversification
4. Asset Selection

<u>INVESTMENT PROCESS:</u>
- Cannot spend the principle
- Rule of Thumb: able to take out 4%
- Spending is typically calculated as a percentage, usually between 4% & 6% of portfolio
- Short Selling → Unlimited Risk

Day of the week effect in trading
- Execution within trading
    - Transaction costs, bid-ask spreads (these rates are high, so limit the amount of transactions)

Portfolio Management Style Drift
- Moving away from your investment strategy / objective

Are we active, passive, or a mixture (can be either or for certain sectors)

Stock Screening - https://finviz.com/

Stock Portfolio Style Box:

	Value	Blend	Growth
Large Cap	Large Cap , Value	Large Cap , Blend	Large Cap , Growth
Mid Cap	Mid Cap , Value	Mid Cap , Blend	Mid Cap , Growth
Small Cap	Small Cap , Value	Small Cap , Blend	Small Cap , Growth

One dollar invested in stocks in 1802 would have grown to $8.8 million in 2003, in bonds to $16,064, in treasury bills to $4,575, and in gold to $19.75.

- Why?

Stocks - are a residual claimant

- Stocks represent claims to real assets
- Income is generated, stocks produce cash flow

Bonds - are a fixed claimant

Market Efficiency (EMH) – notes that stock prices generally reflect all available information

- Are markets random? → if so, then they are inefficient
    - Trying to time the market or pick individual stocks can be challenging, so, avoid market timing

P/E Ratio

- Price-to-Earnings

P/E10 (CAPE) Ratio

P/B Ratio

- Price-to-Book

P/S Ratio

- Price-to-Sales

Stock Market:

- PV of expectations that is generated from a company's CF’s