Dalton Education
BY CERIFI

The Dalton Review® Investment Planning

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Investment Options

- Individual stocks
- Cash and equivalents
- Individual bonds
- Derivatives
- Pooled and managed investments
- Guaranteed investment contracts

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Short-Selling

- Selling first at a higher price, in the hopes of purchasing the stock back at a lower price
  - Characteristics of a short sale
    - Investor must have a margin account and deposit cash or securities to cover any potential price appreciation of the stock
    - Sale proceeds are held by the broker
    - No time limit on how long the short position is held
    - Dividends paid by a corporation must be covered by the short seller

Margin Definition (1 of 5)

- Initial Margin
  - Amount of equity an investor must contribute to enter a margin transaction
  - Can vary based on volatility of stock
    - It is possible to have a margin call within the day of purchase if the price swings greatly.
  - Regulation T set the initial margin at 50% (Federal Reserve)
- Maintenance Margin
  - The minimum amount of equity required before a margin call

Margin Definition (2 of 5)

- Margin Position
  - Represents the current equity position of the investor
  - Example: To purchase 100 shares of Starbucks trading at $50 per share with an initial margin requirement of 75%, Joe must contribute 100 x $50 x .75 = $3,750 and he will borrow $1,250 from his broker
    - ....within two minutes of Joe's purchase of Starbucks, the price fell to $40 per share. What is Joe's margin position?
      - Margin Position = Equity / Fair Market Value
      - ($40.00 - $12.50) / $40.00 = 68.75%

Margin Definition (3 of 5)

- At What Price Does an Investor Receive a Margin Call Price?

$$\frac{\text{Loan}}{1 - \text{Maintenance Margin}}$$

Exam Tip: Memorize! Not on the formula sheet.

Margin Definition (4 of 5)

- Example: Joe purchased 100 shares of Starbucks trading at $50 per share with an initial margin requirement of 75% and a maintenance margin of 35%. At what price would Joe receive a margin call?
    - Loan = $50 x 25%
    - Loan = $12.50 per share
    - Price to Receive a Margin Call = $12.50 / 1 - .35
    - Price to Receive a Margin Call = $19.23

Margin Definition (5 of 5)

- How much equity must an investor contribute?
- Example: Joe purchased 100 shares of Starbucks trading at $50 per share with an initial margin requirement of 75% and a maintenance margin of 35%. The price fell to $15 per share, how much equity must Joe contribute?

Required Equity	Actual Equity
Stock Price: $15	Stock Price: $15
Maint. Margin x .35	Debt: <$12.50>
Required Equity $5.25	Actual Equity $2.50

Research Reports

- Value Line
  - Ranks stocks on a scale of 1 to 5 for timeliness and safety. (1 is highest rank)
- Morningstar
  - Ranks mutual funds, stocks, bonds and Exchange Traded Funds (ETFs) using 1 to 5 stars.
  - 1 star represents the lowest performing, 5 stars represents the highest performing.

- Exam Tip: Know that Value Line ranks stocks and Morning star ranks mutual funds and stocks!

Dividend Dates

- Ex-dividend date
  - If you own, or purchase, the stock prior to the ex-dividend date, then you will receive the dividend
  - If you purchase the stock on or after the ex-dividend date, then you will NOT receive the dividend.

Prior to 5/28/24 (Use for July)	June 1	June 2	June 3	June 4
			Ex-dividend Date	Date of Record

- Exam Tip: Know which purchases will receive the dividend.

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  - As of May 28, 2024, trade settlement changes to T+1.

After 5/28/24 (Use for Nov and March)	June 2	June 3	June 4
		Ex-dividend Date	Date of Record

- Exam Tip: Know which purchases will receive the dividend.

Dividends

- Cash Dividends
  - Qualified dividends receive capital gains treatment
  - A qualified dividend:
    - Paid by an American company or qualifying foreign company
    - Not listed as a dividend that doesn't qualify by IRS
    - Held the stock for more than 60 days during the 121 day period that begins 60 days before the ex-dividend date
- Stock Dividends are not taxable to the shareholder

Stock Splits

- Stock Splits
  - Increases shares outstanding and reduces stock price
    - A 2 for 1 split for an investor with 100 shares at $50 per share
      - How many shares after the split? 200
      - How much is the stock after the split? $25
    - A 3 for 2 split for an investor with 100 shares at $60 per share
      - How many shares after the split? 150
      - How much is the stock after the split? $40

Practice Question 1

- If Tuesday, June 4 is the date of record, when must Joe purchase the stock in order to receive the dividend?
  - June 1
  - June 2
  - June 3
  - May 31

May 31	June 1	June 2	June 3	June 4 (Tuesday)
				Date of Record

Security Regulations (1 of 2)

- Securities Act of 1933
  - Regulates the issuance of new securities (Primary Market)
- Securities Act of 1934
  - Regulates the secondary market and trading of securities
  - Created the SEC
- Investment Company Act of 1940
  - Authorized SEC to regulate investment companies
    - Three types: Open, Closed, Unit Investment Trusts

Security Regulations (2 of 2)

- Securities Investors Protection Act of 1970 (SIPC)
  - Protects investors for losses resulting from broker firm failures.
  - Accounts of member firms are covered for clients regardless of client citizenship.
  - Does not protect investors from incompetence or bad investment decisions.
  - Losses are limited to $500K, including $250K of cash.

Money Market Securities

- Certificates of Deposit
  - Time deposit at a bank with a set interest rate and maturity date
- Treasury Bills
  - Less than 1 year, direct obligation of the government
  - Denominations of $100
- Commercial Paper
  - Short term loans between corporations
  - Maturities 270 days or less, Denominations of $100,000
- Bankers Acceptance
  - Facilitates imports/exports

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Investment Policy Statement (1 of 3)

- Investment Policy Statement
  - Establishes:
    - Client's objectives
    - Limitations on investment manager
  - Used to measure investment manager's performance
  - Does NOT include investment selection

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Investment Policy Statement (2 of 3)

- Objectives
- Return Requirements
  - The return requirement can be specific to a goal such as education or retirement
- Risk Tolerance
  - Clearly defining an investors risk tolerance is key prior to making any investment selections

Investment Policy Statement (3 of 3)

- Constraints
- Time Horizon: When the client anticipates needing the money
- Liquidity: Coincides with time horizon. Investment liquidity should be appropriate for time horizon remaining
- Taxes: Whether the account is taxable or non-taxable
- Laws & Regs.: Could be if the assets are held in trust and terms of the trust
- Unique Circumstances: Anything unique to the client

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Exam Tip: IPS covers RR TTLLU → Risk, Return, Time, Taxes, Liquidity, Legal, and Unique Circumstances

Market Averages and Indices

- Dow Jones Industrial Average
  - Simple price weighted average
  - Does not incorporate market capitalization
- S&P 500
  - Value weighted index - incorporates market capitalization of individual stocks into the average

Exam Tip: Be sure to know the difference between price weighted average and value weighted index.

Standard Deviation (1 of 4)

- Measures the total risk of an undiversified portfolio.
- Measures how much something "flip flops" around an average.
- The bigger the standard deviation, the more risky.

Standard Deviation (2 of 4)

- Be able to calculate standard deviation
- Which investment is more risky?
  -

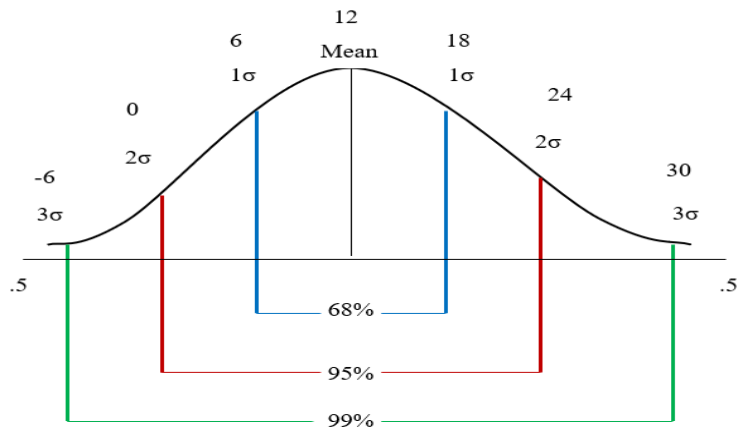
Year	Asset A	Asset B
1	8%	19%
2	10%	20%
3	12%	21%

Standard Deviation (3 of 4)

- Memorize the area under the curve:
  - 68% of the time +/- 1 Standard Deviation
  - 95% of the time +/- 2 Standard Deviations
  - 99% of the time +/- 3 Standard Deviations

    - What is the probability of having a return less than 0% if x = 12% and σ = 6%?

Standard Deviation (4 of 4)



Coefficient of Variation (1 of 2)

- Useful when comparing two assets with different average returns.
- The higher the coefficient of variation, the more risky an investment and the less likely an investor is to achieve the average return.

  - Standardizes the measure of risk per unit of return
  - σ = standard deviation
    x = mean expected (average) return

$$CV = \frac{\sigma}{x}$$

Coefficient of Variation (2 of 2)

- Which investment is more risky? More risk relative to return?

	A	B
x	8%	8%
σ	10%	12%

- Which investment is more risky? More risk relative to return?

	A	B
x	10%	12%
σ	8%	9%

Exam Tip: The asset with lower CV (risk/return) has the higher Risk Adjusted Return (return/risk)

Correlation/Correlation Coefficient

- Correlation and the covariance measure movement of one security relative to that of another.
- Covariance is a relative measure.
- Correlation coefficient is a relative measure.
- The correlation coefficient (represented by the Greek letter Rho or ρ) is calculated as follows:

$$\rho_{ij} = \frac{COV_{ij}}{(\sigma_i)(\sigma_j)}$$

Correlation Coefficient (cont.)

- Correlation ranges from +1 to –1 and provides the investor with insight as to the strength and direction two assets move relative to each other.
  - A correlation of +1 denotes that two assets are perfectly positively correlated.
  - A correlation of 0 denotes that assets are completely uncorrelated.
  - A correlation of –1 denotes a perfectly negative correlation.
  - Diversification benefits (risk is reduced) begin anytime correlation is less than +1.

Covariance

- The covariance is the measure of two securities combined and their interactive risk.
- Covariance is a measure of relative risk
- If the correlation coefficient is known, or a given, covariance is calculated as the deviation of investment 'i' times the deviation of investment 'j' times the correlation of investment 'i' to investment 'j', thusly:

$$COV_{ij} = \rho_{ij} \sigma_i \sigma_j$$

Beta (1 of 2)

- Beta is a measure of systematic risk or market risk, whereas standard deviation is a measure of total risk.
- Beta is an appropriate measure of risk for a well diversified portfolio.

$$B_i = \frac{COV_{im}}{\sigma^2_m} = \frac{\rho_{im}\sigma_i}{\sigma_m}$$

Beta (2 of 2)

- The beta coefficient is a measure of an individual security's volatility relative to that of the market.
- It measures systematic risk dependent on the volatility of the security relative to that of the market.
  - The beta of the market is 1
  - Beta of greater than 1 will have greater fluctuation
  - Beta of less than 1 will have less fluctuation

Practice Question 2

When considering a diversified portfolio, which of the following is an appropriate measure of risk?

A. Standard deviation
B. Beta
C. Covariance
D. Coefficient of determination

Coefficient of Determination

- Coefficient of Determination or R-Squared
  - Measure of how much return is due to the market.
  - Calculate r^2 by squaring the correlation coefficient.
    - For example: If mutual fund XYZ has a correlation coefficient of .80, then its r^2 is .64, which means 64% of fund XYZ's return is due to the market.
    - R-squared also tells the investor if Beta is an appropriate measure of risk.

Practice Question 3

Mutual fund XYZ has a 5 year return of 12%, with a standard deviation of 15%. Fund XYZ has a Beta of 1.4, with a correlation of .90 to the S&P 500. What percent of the return from fund XYZ is due to the S&P 500?

A. 90%
B. 81%
C. 19%
D. 10%

Behavioral Finance

- Managing Bias
  - Financial planners should recognize and/or understand biases
  - Help clients change behavior by overcoming biases

Values, Attitudes and Beliefs

- Socialization
- Multicultural Psychology
- Social Consciousness

Practice Question 4

- Which of the following indexes is the most appropriate benchmark for Joe to measure his portfolio against?

Measure	Index 1	Index 2	Index 3
Beta	.90	1.0	1.5
Stand. Dev.	10%	12%	15%
R-Squared	.85	.89	.95

A. Index 1
B. Index 2
C. Index 3
D. Index 1 and 2

Systematic and Unsystematic Risk

- **Systematic** risk is inherent in the 'system' as a result of the unknown element existing in securities that have no guarantees.
- **Unsystematic** risk is the risk that exists in a specific firm or investment that can be eliminated through diversification.

Systematic Risk	Unsystematic Risk
Undiversifiable Risk	Diversifiable Risk
Market Risk	Unique Risk
Economy-based Risk	Company-specific Risk

Practice Question 5

Stock index funds and exchange traded funds are subject to which of the following risks?

A. Financial Risk
B. Interest Rate Risk
C. Systematic Risk
D. Unsystematic Risk

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Practice Question 6

Which of the following are non-diversifiable risks (CFP® Certification Examination, released 3/95)?

1) Business risk
2) Management risk
3) Company or industry risk
4) Market risk
5) Interest rate risk
6) Purchasing power risk

A. 4, 5 and 6
B. 1, 2 and 3
C. 5, 6 and 2
D. 1, 3 and 4

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Modern Portfolio Theory (1 of 2)

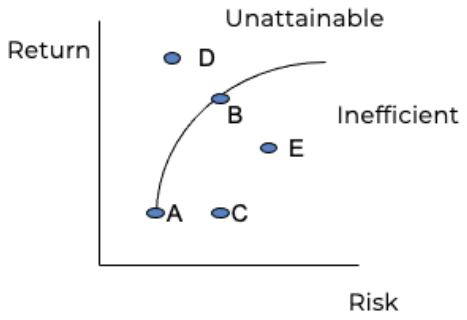
- Modern Portfolio Theory is the acceptance by an investor of a given level of risk while maximizing their expected return objectives.
- The Efficient Frontier is the curve which illustrates the best possible returns that could be expected from all possible portfolios.
- Indifference curves are constructed using selections made based on this highest level of return given an acceptable level of risk.

Modern Portfolio Theory (2 of 2)

- Efficient Portfolio occurs when this goal is accomplished.
- Optimal Portfolio is the one selected from all efficient portfolios.
  - Investors seek the highest return attainable at any level of risk.
  - Investors want the lowest level of risk at any level of return.
  - The assumption is also made that investors are risk averse.

Efficient Frontier

- Compare portfolios on their risk/return relationship. An investor cannot achieve returns above the efficient frontier.



Capital Market Line

The formula for calculation is as follows:

$$r_p = r_f + \sigma_p \left(\frac{r_m - r_f}{\sigma_m} \right)$$

Where:	rp	=	required portfolio rate of return
	rf	=	risk-free rate of return
	rm	=	return of the market
	σm	=	standard deviation of the market
	σp	=	standard deviation of the portfolio

Capital Asset Pricing Model

The Capital Asset Pricing Model (CAPM) calculates the relationship of risk and return of an individual security using the beta (b) as its measure for risk.

The formula looks like this:

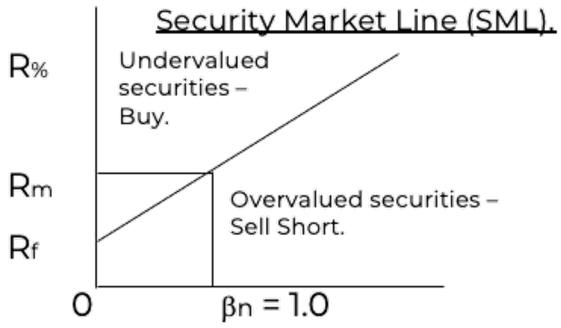
$$r_i = r_f + (r_m - r_f)\beta_i$$

Where:	r	=	required or e
	rf	=	risk-free rate of return
	rm	=	return of the market
	β	=	beta of the individual security

Exam Tip: On the formula sheet, will need to use

Security Market Line

The relationship between risk and return as defined by the CAPM and graphically plotted results in the...



Practice Question 7

What is the intersection on the y-axis of the CML/SML?

A. Risk free rate of return
B. Market portfolio
C. Undervalued asset
D. Overvalued asset

Practice Question 8

If the risk-free rate of return is 3% and the beta of a security is 1.5 and the market risk premium is 9%, what is the expected return?

A. 13.5%
B. 12.5%
C. 16.5%
D. 12%

Portfolio Risk

- The risk of a portfolio can be measured through determination of the interactivity of the standard deviation and covariance of securities in the portfolio.
- The process also utilizes the weight of both securities involved, the deviations of the respective securities, and the correlation coefficient of the two securities.
- The formula :

$$\sigma_\rho = \sqrt{W_i^2\sigma_i^2 + W_j^2\sigma_j^2 + 2W_iW_jCOV_{ij}}$$

- Exam Tip: Formula is on the exam, may not be necessary to use the formula… we'll show you why!

Portfolio Deviation (1 of 2)

Your company has a portfolio made up of two assets, one from the US and the other from Swaziland. Their information is as follows:

	USA	Swaziland
Return	12.2%	18.4%
Deviation	10.5%	23.8%
Weight	50%	50%

The company has asked you to estimate risk involved in the existing portfolio (the correlation between the 2 assets is .15). After calculating you tell them that the portfolio deviation is?

Portfolio Deviation

$$\sigma_p = \sqrt{W_i^2\sigma_i^2 + W_j^2\sigma_j^2 + 2W_iW_jCOV_{ij}}$$

$$= \sqrt{(.50^2)(.105^2) + (.50^2)(.238^2) + 2(.50)(.50)(.105)(.238)(.15)}$$

$$= \sqrt{.00276 + .01416 + .00187}$$

$$= \sqrt{.01879}$$

$$= .137 \text{ or } 13.7\%$$

A. 20.5%

B. 17.2%

C. 13.7%

D. 12.8%

Eliminate A & B because they are equal to or higher than the average. Now you've increased your odds of getting the question right (50/50), without using the formula.

Practice Questions 9

Modern "asset allocation" is based upon the model developed by Harry Markowitz. Which of the following statements is/are correctly identified with this model? (CFP® Certification Examination, released 3/95)

1. The risk, return, and covariance of assets are important input variables in creating portfolios.
2. Negatively correlated assets are necessary to reduce the risk of portfolios.
3. In creating a portfolio, diversifying across asset types (e.g., stocks and bonds) is less effective than diversifying within an asset type.
4. The efficient frontier is relatively insensitive to the input variable.

A. 1 and 2
B. 1, 2 and 3
C. 1 only
D. 2 and 4

Portfolio Performance Measures

Information Ratio

$$IR = \frac{R_P - R_B}{\sigma_A}$$

Where:	Rp	=	portfolio's actual return
	RB	=	return of the benchmark
	σA	=	tracking error of active return

Exam Tip: On your exam formula sheet!

Portfolio Performance Measures

Information Ratio

- The Information Ratio:
  - A **relative** risk-adjusted performance measure
  - Measures the excess return and consistency provided by a fund manager, relative to a benchmark
  - The higher the excess return (or Information Ratio) the better
  - Excess return can be positive or negative depending on the fund's performance relative to its benchmark.

Portfolio Performance Measures

Treynor Index (1 of 2)

The Treynor Index uses the beta of a portfolio as its denominator, and the difference between the portfolio return and the risk free return as the numerator, as follows:

$$T_p = \frac{\overline{r_p} - \overline{r_f}}{\beta_p}$$

Where:

	rp	= realized return on the portfolio
	rf	= risk-free rate of return
	βp	= beta of the portfolio

Exam Tip: On your exam formula sheet!

Portfolio Performance Measures

Treynor Index (2 of 2)

The Treynor Index is:

- A **relative** risk-adjusted performance measure
- Measures the reward achieved relative to the level of systematic risk (as defined by beta)
- Accomplished by standardizing portfolio returns for volatility.
- Treynor Index doesn't indicate whether a portfolio manager has outperformed or underperformed the market.

Portfolio Performance Measures Sharpe Index (1 of 2)

Provides a measure of portfolio performance using a risk-adjusted measure that standardizes returns for their variability. The model measures reward to total variability, or total risk, using the following formula:

$$S_p = \frac{\overline{r_p} - \overline{r_f}}{\sigma_p}$$

Where:

rp = realized return on the portfolio

rf = risk-free rate of return

σp = standard deviation of the portfolio

Exam Tip: On your exam formula sheet!

Portfolio Performance Measures Sharpe Index (2 of 2)

- The Sharpe Index is a relative risk adjusted performance indicator and measures risk premiums of the portfolio relative to the total amount of risk in the portfolio.
- The formula does not measure a portfolio manager's performance against that of the market.
- An investor seeking to invest in a single fund should select the fund with the highest Sharpe ratio.
  - That fund will provide the most return, for each unit of risk.

Portfolio Performance Measures

Jensen's Alpha (1 of 3)

- Treynor and Sharpe are calculations for providing a measure and ranking of relative performance, Jensen's model attempts to construct a measure of absolute performance on a risk-adjusted basis.
- Jensen tells you something all by itself:
  - + alpha = good
  - - alpha = bad

Portfolio Performance Measures

Jensen's Alpha (2 of 3)

$$\alpha_p = \overline{r_p} - \left[\overline{r_f} + \left(\overline{r_m} - \overline{r_f}\right)\beta_p\right]$$

Where:

rp	= realized portfolio return
rf	= risk-free rate of return
αp	= alpha (excess return above expected return)
β_p	= beta of the portfolio
rm	= expected return on the market

Portfolio Performance Measures

Jensen's Alpha (3 of 3)

- The alpha is indicative of the level of a manager's performance.
- The higher the alpha, the better the performance.
- Negative alphas indicate managers who have underperformed the market on a risk-adjusted basis.

Practice Question 10

Donna's mutual fund returned 15% last year, with a beta of 2. The risk free rate of return was 3%, the market return was 8%. The standard deviation is 18%. What would you tell Donna regarding the performance of her mutual fund?

A. The standard deviation was too high, therefore you were under-compensated for the risk your fund took on.

B. The beta is greater than the market, therefore less volatile than the market

C. The alpha is -2%, which means the fund manager underperformed the market on a risk adjusted basis.

D. The alpha is 2%, which means the fund manager outperformed the market on a risk adjusted basis.

Practice Question 11

If mutual fund ABC has a correlation of .80 to the S&P 500, which of the following risk adjusted performance measures would be appropriate to measure the performance of fund ABC?

A. Treynor
B. Jensen
C. Sharpe
D. Treynor and Sharpe

Summary of Performance Measures

- Sharpe and Treynor are relative performance measures.
- When determining which fund performed better on a risk adjusted basis, always rank the Sharpe or Treynor ratios, then select the highest.
- Alpha is an absolute performance measure.
- If the exam doesn't give you r-squared, then select Sharpe!

Arbitrage Pricing Theory

- APT is a multi factor model
- Attempts to take advantage of pricing imbalances
- Inputs are factors(f) such as inflation and expected returns and their sensitivity(b) to those factors

$$R_i = a_1 + b_1F_1 + b_2F_2 + b_3F_3 + e$$

Exam Tip: Standard deviation and Beta are not inputs

Holding Period Return

- Holding Period Return = $\frac{\text{Selling Price – Purchase Price +/- Cash Flows}}{\text{Initial Equity}}$

- Holding period return is not a compounded rate of return
- There is no consideration for the time an investment was held
- HPR questions will come from margin returns or after tax rate of returns.

Practice Question 12

BJ bought 100 shares of Cisco at $20 per share, with an initial margin of 60%. He was charged 10% margin interest annually. After one year he sold the stock for $30 per share. What was BJ's holding period return?

A. 55%
B. 77%
C. 80%
D. 40%

Practice Question 12 - Answer

- BJ bought 100 shares of Cisco at $20 per share, with an initial margin of 60%. He was charged 10% margin interest annually. After one year later he sold the stock for $30 per share. What was BJ's holding period return?

A. 55%
B. 77%-CORRECT
C. 80%
D. 40%

Must know Holding Period Return Formula:

$$\frac{\text{Selling Price} - \text{Purchase Price} +/- \text{Cash Flows}}{\text{Purchase Price or Equity Invested}}$$

$$\frac{(3{,}000 - (2{,}000 \times .40)) - (2{,}000 \times .6) - (2{,}000 \times .40 \times .10)}{(2{,}000 * .60)} = 77\%$$

- (2,000 x .40): Represents amount borrowed that must be paid back when investment is sold
- (2,000 * .60): Represents equity contributed to initial purchase
- (2,000 x .40 x .10): Interest expense on amount borrowed

Exam Tip: Make a flashcard for HPR!

A little easier....

$$\text{HPR margin} = \frac{(\text{TTL SP} - \text{TTL PP}) \pm \text{CFs}}{\text{Out-of-pocket PP}}$$

Ignore margin when calculating the profit because the full amount of profit is still earned

- Total Sale Price (ignoring the margin) = $30 x 100 shares = $3,000
- Total Purchase Price (ignoring margin) = $20 x 100 shares = $2,000

CF = -$80 for margin interest ($800 borrowed x 10% int)

Out-of-pocket PP = 60% IMR x $2,000 = $1,200

$$\frac{(\$3{,}000 - \$2{,}000) - \$80 = \$920}{\$1{,}200}$$

Holding Period Return

- Another method of calculating the holding period return when you are provided with periodic returns (instead of cash flows) is:

$$HPR = [(1 + r_1) \times (1 + r_2) \times ...(1 + r_n)] - 1$$

EXAM TIP: On formula sheet

- Assume the following monthly returns: 2%, 3.5%, (1.5)%
- The three month holding period return is:

$$HPR = [(1 + 0.02) \times (1 + .035) \times (1 - 0.015)] - 1$$
$$HPR = [(1.02) \times (1.035) \times (.985)] - 1$$
$$HPR = [1.0399] - 1$$
$$HPR = .0399 = 3.99\%$$

Effective Annual Rate

$$EAR = (1 + i/n)^n - 1$$

EXAM TIP: On formula sheet

i = stated annual interest rate

n = number of compounding periods

This formula calculates the effective annual interest rate earned on an investment when the compounding occurs more often than once per year.

Example: The effective annual rate of 10% compounded quarterly is:

EAR = (1 + .10/4)4 – 1

EAR = (1 + .025) 4 – 1

EAR = (1.025) 4 – 1

EAR = 1.1038 – 1 = .1038 = 10.38%

EXAM TIP: Earning 10% compounded quarterly is equivalent to earning 10.38% compounded annually.

Geometric Average

Geometric average or geometric mean is a time weighted compounded rate of return.

Formula: $\sqrt[n]{(1+r1)(1+r2)(1+r3)\ldots(1+rn)} - 1 \times 100$

Exam Tip: On the formula sheet!

Example:

Year	Return
1	12%
2	15%
3	<2%>

$\sqrt[3]{(1.12)\ (1.15)\ (.98)} - 1 \times 100$

= 8.07%

Use your calculator!
Pv: -1
Fv:
N:
PMT:

I =

Weighted Average

- The weighted average takes into account the number of shares of each of the various priced securities that are owned. Given the information that investor owns 15 shares of 'X' at $12 per share, 5 shares of 'Y' at $15 per share, and 1 share of 'Z' at $27 per share, the results of the calculation would look like this:

15($12) + 5($15) + 1($27)	=	$282	=	$13.42
Total number of shares		21		

Weighted Average Portfolio Return

In the case of a portfolio calculation for the weighted average return there are several factors that must be taken into account in the process of the calculation:

1. The **current market value** of the securities held. CMV
2. The **total portfolio value**. TPV
3. The **return of each security** throughout the period in question.

Weighted Average Portfolio Return

Three securities, X, Y, and Z make up the portfolio. The shares of 'X' in the portfolio have a market value of $10,000 and during the period returned 15%. 'Y' has a market value of $15,000 and returned 12%. 'Z' has a market value of $25,000 and returned 10% over the period.

Security	1. CMV	Divided by	2. TPV	Multiplied by	3. % Return	Equals	Weighted Return
X	$10,000	÷	$50,000	x	15%	=	3.0%
Y	$15,000	÷	$50,000	x	12%	=	3.6%
Z	$25,000	÷	$50,000	x	10%	=	5.0%
			Weighted	**Average**	**Portfolio**	**Return**	**11.6%**

Weighted Average Beta

What is the weighted average beta of a portfolio with $75,000 invested in Company A with a beta of 1.35, $125,000 invested in Company B which has a beta of 1.8 and $25,000 in Company C with a beta of .65?

A. 1.28
B. 1.52
C. 1.47
D. 2.16

Weighted Average Beta Answer

Security	1. CMV	Divided by	2. TPV	Multiplied by	3. % Return	Equals	Weighted Return
Co A	75,000	÷	225,000	X	1.35	=	
Co B	125,000	÷	225,000	X	1.8	=	
Co C	25,000	÷	225,000	X	.65	=	
						Total	

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Practice Question 13

You own a balanced mutual fund with $600,000 in stocks and $400,000 in bonds. The balanced fund returned 9%. The return of the S&P 500 was 15% and the benchmark bond fund returned 5%. Did your balanced mutual fund out perform its benchmark?

A. Yes, the fund did.
B. No, its return was less than 11%.
C. Yes, because its return was greater than 5%.
D. Insufficient information to answer the question.

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Net Present Value (1 of 2)

- Net Present Value (NPV) is used to evaluate capital expenditures that will result in differing cash flows over the useful life or investment period.
- NPV is deterministic.
  - A positive NPV the investor would make the investment.
  - A negative NPV and the investor would not make the investment.

NPV = PV of Cash Flows – Initial Cost

Exam Tip: If NPV = 0, then "yes" make the investment.

Net Present Value (2 of 2)

A business is considering purchasing a piece of new equipment for $120,000. The equipment will generate the following revenues: Year 1 $50,000 Year 2 $30,000 Year 3 $20,000 Year 4 $10,000 and the machine can be sold at the end of year four for $25,000. Assuming a discount rate of 8%. Should they purchase the new piece of equipment?

CF0 <120,000>
CFj 50,000
CFj 30,000
CFj 20,000
CFj 10,000 + 25,000
I = 8
NPV = <6,381>

Therefore the business should not purchase the equipment because the initial cost exceeds the present value of the cash flows generated.

Internal Rate of Return (1 of 4)

IRR is the discount rate that sets the NPV formula equal to zero.

NPV = PV of Cash Flows – Initial Cost

IRR can also be thought of as a compounded rate of return.

IRR should be calculated when you have uneven cash flows and you are asked to calculate a compounded rate of return

Internal Rate of Return (2 of 4)

- Consider the previous example:
  - A business is considering purchasing a piece of new equipment for $120,000. The equipment will generate the following revenues: Year 1 $50,000 Year 2 $30,000 Year 3 $20,000 Year 4 $10,000 and the machine can be sold at the end of year four for $25,000. What is the compounded return for this project?

Internal Rate of Return (3 of 4)

CF0 <120,000>

CFj 50,000

CFj 30,000

CFj 20,000

CFj 10,000 + 25,000

IRR = 5.35%

Intuitively, we should have expected a return less than 8%.

Recall that a discount rate of 8% yielded a negative NPV.

Internal Rate of Return (4 of 4)

Sydney buys a stock at $40 and it pays the following dividends:

Year 1 $2.00
Year 2 $2.50
Year 3 0
Year 4 $2.75

What is Sydney's compounded rate of return if the stock can be sold for $45 in Year 4:

CF_0 <40.00>

CFj 2.00

CFj 2.50

CFj 0

CFj 2.75 + 45

IRR = ?

Dollar-Weighted Return

The IRR using the investor's cash flows.

Example:

Joe purchases 1 share of DIS for $50. One year later the stock pays a dividend of $4 and Joe purchases an additional share for $65. Joe sold the stock one year later for $75? What was Joe's dollar weighted return?

Period	Cash Flow
0	<50>
1	<61> ($4 dividend – $65 share purchase)
2	150 (2 shares sold at $75 each)
	IRR = 22.63%

Time-Weighted Return (1 of 2)

- The IRR using the security's cash flow. Assumes a buy and hold.
- Determined without regard to the investors cash flows
- Mutual funds report on a time-weighted return basis

Exam Tip: You may not have to calculate dollar or time weighted return, but you must know that mutual funds report on a time-weighted basis!

Time-Weighted Return (2 of 2)

Example:

Joe purchases 1 share of DIS for $50. One year later the stock pays a dividend of $4 and Joe purchases an additional share for $65. Joe sold the stock one year later for $75? What was the time weighted return?

Period	Cash Flow
0	<50>
1	4
2	75
	IRR = 26.54%

Dividend Discount Model

The dividend discount model values a company's stock by discounting the future stream of cash flows.

$$V = \frac{D_1}{r - g}$$

Formula is on the exam formula sheet!

This model is also known as the intrinsic value model.

D_1 is the next expected dividend, and is arrived at using the current dividend and earnings growth rate as follows:

$$D_1 = D_0(1 + g)$$

Dividend Discount Model

- Important Exam Tips:
  - If the required rate of return decreases, the stock price will increase
  - If the dividend is expected to increase, the stock price will increase
  - If the required rate of return increases, the stock price will decrease
  - If the dividend is expected to decrease, the stock price will decrease

Exam Tip: Make a flashcard of these relationships!

Expected Rate of Return

- Through a restructuring of the formula used to calculate value one can calculate an expected rate of return (r). This formula uses 'price' (P), that is market price, in place of value (V) in the calculation, as follows:
-
- A stock recently paid a dividend of $3.25. The m $r = \frac{D_1}{P} + g$ 5.00 and the company's growth rate is 6%. Your investor requires an 11% return nts.

  - a) What is the intrinsic value of this stock?
  - b) If he buys at market price what is his expected rate of return?
  - c) Is the stock over or under-valued at its current market price?

Exam Tip: Also on Formula Sheet

Expected Rate of Return (Answers)

A stock recently paid a dividend of $3.25. The market price is $45.00 and the company's growth rate is 6%. Your investor requires an 11% return on all investments.

$$r = \frac{D_1}{P} + g$$

a) What is the intrinsic value of this stock?

(3.25 x 1.06) ÷ (.11 - .06) = $68.90

b) If he buys at market price what is his expected rate of return?

((3.25 x 1.06) ÷ 45.00) + .06 = 13.7%

c) Is the stock over or under-valued at its current market price?

Undervalued

Practice Question 14

The current annual dividend of ABC Corporate is $2.00 per share. Five years ago the dividend was $1.36 per share. The firm expects dividends to grow in the future at the same compound annual rate as they grew during the past five years. The required rate of return on the firm's common stock is 12%. The expected return on the market portfolio is 14%. What is the value of a share of common stock of ABC corporation using the constant dividend growth model? (CFP® Certification Examination, released 3/95)

A. $11
B. $17
C. $25
D. $54

Practice Question 15

Assume the following dividends will be paid in the coming years:

Year 1: $2.00
Year 2: $2.50
Year 3: $3.00

After the third year the dividend will grow at 8% and the investor's required rate of return is 10%. What is the intrinsic value of the stock?

A. $116.78
B. $125.45
C. $127.85
D. $134.98

Price-Earnings Ratio

- The P/E Ratio (price to earnings ratio) represents the number of dollars an investor will to pay for each dollar of company earnings. It is the measure of relationship between a stock's price and its earnings. It is the stock price as a multiple of company earnings.
- P/E ratios are a useful tool used to value a stock if the firm pays no dividends. The relationship of price to earnings is known as the P/E multiplier, and price is arrived at as follows.

- (Earnings Per Share) x (P/E multiplier) = (Expected Price Per Share)

Price – Earnings Ratio

- Two ways PE ratio questions can be asked:

Ice Cream Corp has earnings per share of $3.00 and their stock price is trading at $40 per share. What is their P/E ratio?

PE = Stock Price ÷ EPS
PE = 40.00 ÷ 3.00
PE = 13.3

Ice Cream Corp is trading at $50 per share and has a P/E ratio of 20. What is their EPS?

PE = Stock Price ÷ EPS
20 = 50.00 ÷ EPS
EPS = 50.00 ÷ 20
EPS = $2.50

Dividend Payout Ratio

- Is the relationship between the amount of earnings paid to shareholders in the form of a dividend, relative to earnings per share

$$\text{Dividend Payout Ratio} = \frac{\text{Common Stock Dividend}}{\text{Earning Per Share}}$$

- The higher the dividend payout ratio, typically the more mature the company.
- A high dividend payout ratio may also indicate the possibility of the dividend being reduced.

Exam Tip: Make a flashcard. Not on your exam formula sheet!

Dividend Payout Ratio Example

Kevin's Cars Inc has the following information, what is the dividend payout ratio?

- EPS $2.00
- C/S Dividend $1.00
- P/S Dividend $.50
- Sales $5,000,000
- Shares Outstanding 1,000,000
- Total Equity $7,000,000

Dividend Payout Ratio = $\frac{\$1.00}{\$2.00}$

50%

Return on Equity

- Measures the overall profitability of a company. There is a direct relationship between ROE, earnings and dividend growth.

$$ROE = \frac{\text{Earnings Per Share}}{\text{Stockholders Equity per Share}}$$

Exam Tip: Make a flashcard. Not on your exam formula sheet!

Return on Equity Example

Kevin's Cars Inc has the following information, what is the return on equity?

EPS $2.00
C/S Dividend $1.00
P/S Dividend $.50
Sales $5,000,000
Shares Outstanding 1,000,000
Total Equity $7,000,000

$$ROE = \frac{2.00}{(7{,}000{,}000 / 1{,}000{,}000)}$$

28.5%

Dividend Yield

States the annual dividend as a percentage of the stock price.

$$\text{Dividend Yield} = \frac{\text{Dividend Per Share}}{\text{Stock Price}}$$

Exam Tip: Make a flashcard. Not on your exam formula sheet!

Sample Exam Question

Which company has the highest Dividend Payout Ratio?

	A	B	C	D
Dividend Yield	8%	5%	6%	12%
Stock Price	$20	$50	$30	$40
EPS	$2.00	$2.50	$2.40	$5.00

Sample Question Answer

Which company has the highest Dividend Payout Ratio?

	A	B	C	D
Dividend Yield	8%	5%	6%	12%
Stock Price	$20	$50	$30	$40
EPS	$2.00	$2.50	$2.40	$5.00
Dividend	$1.60	$2.50	$1.80	$4.80
Dividend Payout Ratio	80%	100%	75%	96%

Answer: Company B

Strategies to Reduce Investors Risk

Dollar Cost Averaging

Date	Per Share Price	Total Cost	No. of Shares
1/1/21	$10	$500	50
2/1/21	$ 8	$500	62.5
3/1/21	$ 5	$500	100
4/1/21	$ 9	$500	55.6
5/1/21	$12	$500	41.7
6/1/21	$15	$500	33.4
		$3,000	343.2

Average per share cost in this example is $8.74

Efficient Market Hypothesis

- Random Walk Theory. This theory states that:
- the behavior of stock prices closely resembles a random walk.
- prices of stocks are “unpredictable” but not “arbitrary”.
- there is a reason why prices behave as they do, but forecasters cannot predict with consistency or accuracy what the response to any given stimuli will be.
- at any given moment prices that exist on securities are the best incorporation of all available information and a true reflection of the value of that security.
- prices are in equilibrium.

Efficient Market Hypothesis

- Weak
  - Historical information will not help investors achieve above average market returns. Essentially rejects technical analysis
- Semi-Strong
  - Historical and public information will not help investors achieve above average market returns. Rejects technical and fundamental analysis
- Strong
  - Historical, public and private information will not help investors achieve above average market returns. Rejects technical & fundamental analysis, and also inside information. So, diversify stocks randomly or merely go with an Index

Exam Tip: Make a flashcard for all three forms. There will be questions surrounding the EMH!

Practice Question 16

Which of the following forms of the efficient market hypothesis supports technical analysis?

A. Strong
B. Semi-Strong
C. Weak
D. None of the above

Practice Question 17

An investor believes that regardless of the information source, it is not possible to create a strategy that will consistently earn excess risk-adjusted returns. The investor relies on index funds. Which of the following forms of the efficient market hypothesis is the investor advocating?

A. Strong
B. Semi-Strong
C. Weak
D. All of the above

Practice Question 18

Which form of the efficient market hypothesis rejects an investor reading 10-K filings?

I. Weak
II. Semi-Strong
III. Strong

A. I only
B. II and III
C. III only
D. All of the above

Market Anomalies

- January Effect
- Small Firm Effect
- Value Line Effect
- P/E Effect
- AFC/NFC
- Presidential Elections

- If the EMH is correct, why do we see anomalies in the marketplace?
  - Market anomalies do not support the EMH or any of the three forms.

Investment Strategies

- Active
  - Investors believe markets are inefficient.
  - Investors can achieve above average market returns through active investing.
- Passive
  - Investors believe the markets are efficient.
  - A passive buy and hold investment strategy is best.

- Example: Joe is your client and he believes that you can help him improve his returns by assisting him with his investment selections. What type of method is appropriate?
  - Active asset allocation with active security selection!

U.S. Treasury Securities
Non-marketable U.S. Treasury Issues

- Series E Bonds and Series EE Bond
  - Sold at face value
  - Non marketable, nontransferable
  - Do not pay interest periodically
- Series H Bonds and Series HH Bonds
  - They pay interest semiannually – different than EE bonds
- Series I Bonds
  - Inflation protection via fixed rate + variable rate (see TIPS on next slide)
  - Do not pay interest periodically

U.S. Treasury Securities
Marketable U.S. Treasury Issues

- U.S. Treasury Bills: Maturities < 1 year
- U.S. Treasury Notes: Maturities between 2 – 10 years
- U.S. Treasury Bonds: Maturities greater than 10 years
- All U.S. Treasury securities are non-taxable at the state and local level

U.S. Treasury Securities

- Treasury Inflation Protected Securities (TIPS)
  - Principal adjusts for inflation, apply coupon rate to new principal amount.
  - Provides inflation and purchasing power protection
  - Coupon rate does not change as is the case with I Bonds - important
- STRIPS
  - Separate trading of coupon payments and principal amount
  - Essentially creates many zero coupon bonds

Federal Agency Securities

- Backed by The Full Faith and Credit of the US Gov't:
- Government National Mortgage Association (GNMA-Ginnie Mae)
- Not Backed by The Full Faith and Credit of the US Gov't:
- Federal National Mortgage Association (FNMA - Fannie Mae)
- Federal Home Loan Mortgage Corporation (FHLMC - Freddie Mac)
- Student Loan Marketing Association (SLMA - Sallie Mae)
- Federal Farm Credit Banks (FFCB)
- Federal Intermediate Credit Banks (FICB)
- Federal Home Loan Bank (FHLB)

Exam Tip: GNMA is usually tested as the agency that is backed by full faith and credit of US government!

Secured Bonds

- Mortgage Bonds
- Backed by a pool of mortgages
- Payment consists of both principal and interest
- Biggest risks: Default and Prepayment Risk
- Collateral Trust Bonds
- Backed by an asset that the company owns

Secured Bonds

- Collateralized Mortgage Obligations
- Investors are divided into “Tranches” (A-Z).
- Investors in the short term tranche (A) receive principal before investors in the long term tranche (Z).
- Meant to mitigate: Prepayment risk

Unsecured Bonds

- Debentures
- Subordinated Debentures
- Income Bonds
- Variable Interest Rate Bonds

Municipal Bonds (1 of 3)

- General Obligation Bonds
  - Backed by the full faith, credit and taxing authority of the municipality that issued the bond
- Revenue Bonds
  - Backed by the revenue of a specific project
  - Full faith, credit and taxing authority does not back the bond

Municipal Bonds (2 of 3)

- Private Activity Bonds
  - Used to fund construction of stadiums
- Insured Municipal Bonds
  - American Municipal Bond Assurance Corp AMBAC
  - Municipal Bond Insurance Association Corp MBIA
- **Municipal bonds are non taxable at the federal, state and local level if you live in the issuing state**
- **Bonds issued by territories of the US (Puerto Rico) are not subject to taxes at federal, state and local.**

Municipal Securities (3 of 3)

- Tax Equivalent & Tax Exempt Yields
- Tax equivalent yield = $TEY = r/(1-t)$

Where r = tax exempt yield
t = marginal tax rate

Exam Tip: On the formula sheet.

- After tax yield = (Corporate Rate) x (1 - marginal tax rate)
- Tax Equivalent: think pre-tax

Exam Tip: Not on the formula sheet.

Tax Equivalent Yield Example

- Which of the following bonds would you recommend if the investor wants to maximize his after tax rate of return, assuming a tax rate of 35%?
  - Corporate 8.5%
  - Municipal 5.25%

Corporate $8.5\% \times (1-.35) = 5.525\%$ | Municipal $\frac{5.25\%}{(1-.35)} = 8.07\%$

Practice Question 19

What is the taxable equivalent yield on a treasury security paying 3.5% if the marginal federal tax rate is 35% and state income tax rate is 5%?

A. 5.8%
B. 3.68%
C. 5.1%
D. 4.8%

Practice Question 20

If the yield ratio is

$$\frac{\text{Rtf (tax-free)}}{\text{Rt (taxable)}}$$

how does a higher ratio affect the attractiveness of municipal bonds?

A. The higher the ratio, the more appealing.
B. The lower the ratio, the more appealing.
C. Both A and B.
D. Neither A or B.

Conventional Yield Measures of Bonds

1. Coupon Rate

the annual payment amount in dollars, divided by the par value. A bond pays $100 per year with a par value of $1,000.00.

$$\text{Coupon Rate} = \frac{\$\ 100}{\$1{,}000} = 10\%$$

2. Current Yield

the annual payment amount in dollars divided by the current price of the bond. A bond pays $100 per year total, with a current market price of $876.00.

$$\text{Current Yield} = \frac{\$\ 100}{\$\ 876} = 11.42\%$$

Conventional Yield Measures of Bonds (cont.)

3. Yield to Maturity

discounting a stream of cash flows over the life of the investment and adding the discounted value of the future par value repayment. In the previous example of the bond paying 10% interest or $100 a year ($50 semiannually), the market price indicated is $876. There is a 5-year period to maturity, at which time the $1,000 par value will be paid to the investor. The calculation is as follows:

N = 10
PV = -876
PMT = 50
FV = 1000
i = ? 6.7447 x 2 = 13.49%

Practice Question 21

What is the yield to maturity of a bond that is selling at a 5% discount to par, paying 11.25% interest and maturing in 7 years?

A. 11.23%
B. 12.34%
C. 13.10%
D. 13.79%

Exam Tip: Always assume semi-annual compounding on the exam, unless told otherwise in the question.

Practice Question 22

Joe purchased a bond for $880 with a 9% coupon. He sold the bond after one year when it was paying him a current yield of 10%. What is the holding period return?

A. 12.5%
B. 9.0%
C. 10.0%
D. 9.5%

Exam Tip - Similar question on the exam frequently!

Yield Summary

10% CR, semi annual, 20 Year, Current Price $1,200 Callable in 5 years at $1,050	**10% CR, semi annual, 20 Year, Current Price $1,000 Callable in 5 years at $1,050**	**10% CR, semi annual, 20 Year, Current Price $800 Callable in 5 years at $1,050**
Coupon = 10%	Coupon = 10%	Coupon = 10%
Current Yield = 8.3%	Current Yield = 10%	Current Yield = 12.5%
YTM = 7.98%	YTM = 10%	YTM = 12.79%
YTC = 6.16%	YTC = 10.78%	YTC = 16.74%
Premium	Par	Discount

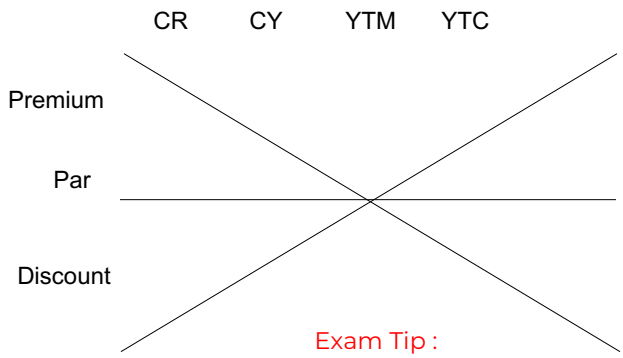
Exam Tip – There's often a question on the exam about the relationship between Coupon, Current Yield and YTM. Make a flashcard!

Sample Question

If a bond is selling at par and callable at par, what yields are equal?

10% CR
20 year
Current Price = $1,000
Callable 5 years @ $1,000

Yield Summary



Exam Tip :

Premium (High to Low): CR – CY – YTM – YTC

Discount (Low to High): CR – CY – YTM - YTC

Accrued Interest

- Buyer of a bond pays the seller for accrued interest since last coupon payment.
- Buyer receives a 1099 for total coupon payment.
- Buyer is entitled to a deduction for accrued interest paid.

Accrued Interest Example

Taylor buys ten bonds listed as (MSFT 6.00s 07/01/25) on September 30th. The bond pays interest semi-annually. The price of the bond was $9,500 plus $100 commission. Taylor actually had to pay his broker the following:

Bond Price: $9,500

Commission: $100

Accrued Interest: $150 (6% x 10,000 x 3/12)

Total payment to broker = $9,750

Original Issue Discount

- OID is the discount value that a bond is issued for (originally sold) versus par.
  - Examples: Zero-coupon bonds
- From a tax perspective, the OID must be accreted (recognized) each year. Therefore, the bond owner is paying income tax on "phantom" interest income since they are not receiving the actual interest payments until maturity.
- Upon maturity the holder will receive the face value of the bond and no additional income tax will be owed since tax was paid while interest accrued within the security.

Practice Question 23

Treasury zero coupon bonds are particularly suited to which of the following types of accounts? (CFP® Certification Examination, released 2004)

A. IRA
B. Trust
C. Corporate
D. Joint

Yield Curve Theories

- Liquidity Preference Theory
  - The yield curve results in lower yields for shorter maturities because investors prefer liquidity and are willing to pay for liquidity in the form of lower yields.
- Market Segmentation Theory
  - The yield curve depends on supply and demand at a given maturity.
- Expectations Theory
  - The yield curve reflects investors inflation expectations. Typically, since investors are uncertain or believe inflation will be higher in the future, long term yields are higher than short term yields

Unbiased Expectations Theory (UET)

- The theory holds that today's longer term interest rates have imbedded in them expectations about future short term interest rates. More specifically, long term rates are geometric averages of current and expected future shorter-term interest rates. The formula takes the following form:

$$ {}_1R_N = \left[(1+{}_1R_1)\left(1+E({}_2r_1)\right)\ldots\left(1+E({}_Nr_1)\right)\right]^{\frac{1}{N}} - 1 $$

${}_1R_N$ = Actual N-period rate today

N = term to maturity, N = 1, 2, 3, …

${}_1R_1$ = Current one-year rate today

$E({}_ir_1)$ = expected one-year rate at period i, where i = 1 to N. For example the one-year rate expected at year three would be: $E({}_3r_1)$

Unbiased Expectations Theory (UET) Example

- Example: Assume that the one-year rate today is 4%. Also assume that rates are expected to rise in the future, and that the one-year rate, next year, is predicted to be 4.5%.

- According to the UET, the two-year rate being quoted today must reflect both one year rates: 4% for one a one-year loan today, and 4.5% for a one-year loan this time next year. According to the theory, the two-year rate today ($_1R_2$) should be equal to:

$$_1\boldsymbol{R}_2 = \left[(1 + {}_1R_1)\left(1 + E({}_2r_1)\right)\right]^{\frac{1}{N}} - \mathbf{1}$$

$$_1\boldsymbol{R}_2 = [(1.04)(1.045)]^{\frac{1}{2}} - \mathbf{1}$$

$$_1\boldsymbol{R}_2 = [(1.0868)]^{\frac{1}{2}} - \mathbf{1}$$

$$_1\boldsymbol{R}_2 = .042497 = 4.2497\%$$

Bond Duration

- Duration indicates:
  - A bond's price sensitivity to changes in interest rates
    - The higher the duration, the more price sensitive or volatile the bond is to interest rate changes
  - It's the moment in time the investor is immunized from interest rate risk and reinvestment rate risk
  - It's the weighted average time until an investor receives all the coupon payments and principal
  - A bond portfolio should maintain a duration equal to the investor's time horizon to be effectively immunized

Critical Duration Relationships

- The higher the Duration, the more volatile the bond's price
- The longer the Maturity, the higher the Duration
- The higher the Coupon, the shorter the Duration

  The higher the YTM, the shorter the Duration

> D > V

> M > D

> C < D

> Y < D

Exam Tip: There's an INverse relationship between coupon/YTM (which are INterest rates) and duration.

Bond Duration

- Calculating Bond Duration
  - A zero coupon bond will always have a duration equal to its maturity.
  - As the coupon rate increases, the duration decreases.
    - For example (estimates only for duration):
      - Bond A 30 year zero coupon, duration = 30
      - Bond A 30 year 5% coupon, duration = 27
      - Bond A 30 year 10% coupon, duration = 25
  - Use the formula on the formula sheet to calculate duration.

Calculating Duration

Formula from exam formula sheet:

$$D = \frac{1+y}{y} - \frac{(1+y)+t(c-y)}{c\left[(1+y)^t - 1\right]+y}$$

Where: y = Yield to Maturity of the Bond
c = Coupon Rate of the Bond
t = Number of Periods to Maturity

Calculating Duration Example

Consider a bond with a $1,000 par value, five years to maturity, with a 6% annual coupon. The yield to maturity is 8% and the bond is selling for $920.15. What is the duration of the bond?

$$\frac{1+.08}{.08} - \frac{(1+.08)+5(.06-.08)}{.06[(1+.08)^5-1]+.08}$$

$$\frac{1.08}{.08} - \frac{(1.08)+5(-.02)}{.06[1.4693-1]+.08}$$

$$13.5 - \frac{.98}{.0281+.08}$$

$$13.5 - \frac{.98}{.0281 + .08}$$

10B: 1.08 OS y^x 5 =

12c: 1.08 [Enter] 5 y^x

Answer 1.4693

= 4.4344

Estimating Bond Price

- Duration can also be used to estimate the price change of a bond, based upon a change in interest rates.

$$\text{\% change in price of bond} \rightarrow \frac{\Delta P}{P} = -D \times \frac{\Delta Y}{(1 + Y)}$$

Exam Tip: Formula is on your exam formula sheet.

Estimating Bond Price Example

- Consider a bond with a $1,000 par value, five years to maturity, with a 6% annual coupon. The yield to maturity is 8% and the bond is selling for $920.15. What is the duration of the bond? 4.4years. What is the new price of the bond if interest rates decrease by .5%?

$$\frac{\Delta P}{P} = -4.4 \times \frac{-0.005}{1+.08}$$

$$\Delta P = 0.0204 = 2.04\%$$

- Therefore, the new price of the bond will be $938.92 ($920.15 x 1.0204)

Bond Immunization

(Proof of Concept – Not an example you will see on exam)

Interest Rates	8%	7%	9%
Reinvested Coupon		(change I to 7%)	(change I to 9%)
N = 4.4, I = 8, PV = 0, PMT = 60, FV = ?	302.26	297.22	307.39
Proceeds of Bond			
N = .6, I = 8, PV = ?, PMT = 60, FV = 1,000	988.71	994.32	983.20
Reinvested Coupon	302.26	297.22	307.39
Proceeds of Bond	988.71	994.32	983.20
Total in 4.4 Years	$1,290.97	$1,291.57	$1,290.59

Practice Question 24

Mike is saving for his child's education, which is approximately 4 years from now. Which of the following bonds should Mike invest in to immunize his portfolio?

Bond A: AAA rate, 5-year maturity, 3.86 duration, 11% coupon, selling for $954

Bond B: AA rated, 4-year maturity, 3.2 duration, 12.5% coupon selling for $982

Bond C: AA rated, zero-coupon, 5 year maturity, selling for $575

A. Bond B, because its maturity matches the goal time frame.

B. Bond A, because it has a higher credit rating than the others.

C. Bond C, because it's a zero coupon, its duration is 5 years.

D. Bond A, because its duration matches the goal time frame.

Practice Question 25

An investor expects interest rates to increase, which type of bond would the investor prefer?

Bond A: AAA rate, 10-year maturity, 8.86 duration, 11% coupon, @ $954

Bond B: AA rated, 5-year maturity, 4.2 duration, 12.5% coupon @ $982

Bond C: AA rated, zero-coupon, 30 year maturity, selling for $575

A. Bond A

B. Bond B

C. Bond C

Practice Question 26

An investor expects interest rates to decrease, which type of bond would the investor prefer?

Bond A: AAA rate, 10-year maturity, 8.86 duration, 11% coupon, selling for $954

Bond B: AA rated, 5-year maturity, 4.2 duration, 12.5% coupon selling for $982

Bond C: AA rated, zero-coupon, 30 year maturity, selling for $575

A. Bond A

B. Bond B

C. Bond C

Preferred Stock

- Has both equity and debt features
  - Debt Features
    - Stated par value
    - Stated dividend rate as a percentage of par
  - Equity Features
    - Price of a bond may generally move with the price of common stock
  - Differences
    - Dividend does not fluctuate like a common stock dividend
    - No maturity date like a bond

Preferred Stock Cont.

- Tax Advantage
  - For tax years beginning after Dec. 31, 2017, the 70% dividends-received deduction is reduced to 50% and the 80% dividends-received deduction for 20% or more owned corporations is reduced to 65%.
  - The same deduction applies to common stock dividends as well.

Exam Tip: Make a flashcard on differences and stated/fixed dividend qualities and tax advantage of P/S!

Convertible Bonds

Conversion Value is the value of the convertible bond in terms of the stock into which it can be converted. To calculate conversion value:

$$CV = \frac{Par}{CP} \times P_s$$

Exam Tip: Formula is NOT on your exam formula sheet.

Convertible Bonds Example

William purchased a bond for $1,050. The conversion price is $40 and the market price of the common stock is $35. What is the conversion value of the bond?

$$CV = \frac{1{,}000}{\$40} \times 35$$

CV = $875

Represents the conversion ratio. How many shares can the convertible be converted into.

Property Valuation

Property valuation formula:

$$\text{Value} = \frac{\text{Net Operating Income (NOI)}}{\text{Capitalization Rate}}$$

NOI = Net Income + Depreciation + Interest Expense

- Net income is defined as income less fixed and variable operating expenses.

OR

NOI = Gross income – Operating Expenses

- Vacancy rate reduces gross income!

Practice Question 27

Kevin owns a condominium on the gulf coast of Florida. The condominiums generate about $2,000,000 in rent annually. His expenses are $300,000 in maintenance, $500,000 in salaries, $200,000 in utilities, $250,000 in depreciation, and $250,000 in mortgage payments where $200,000 is principal and $50,000 is interest expense. Assuming a 10% required rate of return, how much would an investor be willing to pay for the property?

A.$1,000,000
B.$500,000
C.$5,500,000
D.$10,000,000

Investment Companies

- Closed
  - Fixed initial market capitalization
  - Shares trade on an organized exchange
  - May trade at a premium or discount to NAV
- Open
  - Unlimited initial market capitalization
  - Shares are bought and redeemed directly from fund family
  - Shares trade at NAV
- Unit Investment Trust
  - Can be equity or fixed income unit investment trust
  - Typically fixed income trust
  - Self liquidating
  - Passive management, no trading of assets within the trust
  - Units, not shares

Exam Tip: Know the keywords, “Passive” & “Self-Liquidating”.

Types of Mutual Funds

- Index Funds
  - Track the performance of various market indexes, passive approach
- Growth Funds
  - Invests in equities with a high PE
  - Primary objective is to generate capital appreciation
- Growth and Income Funds
  - Invests in equities and income producing assets
  - Primary objective is to create capital appreciation and income
- Balanced Fund
  - Invests in more bonds than typical equity fund

Types of Mutual Funds, Cont.

- Global fund
  - Invests in international and U.S. securities
- International fund
  - Invests in international securities and excludes U.S. securities

Exam Tip: May be given client facts and asked to recommend a portfolio of mutual funds. Always recommend the most diversified portfolio of funds (all else being equal).

Practice Question 28

A client has a growth objective but requires a large percentage of the return to be tax-efficient. Which of the following products would be most appropriate for this client? (CFP® Certification Examination, released 2004)

A. Non-leveraged equipment leasing
B. Balanced mutual fund
C. Preferred stock mutual fund
D. Stock index fund

Fund Expenses

- A Shares
  - Front end load
  - Small 12b-1 fee
  - No redemption fee
- B Shares
  - Redemption fee
  - Maximum 12b-1 fee of 1%
  - No front end load
  - Convert to A shares
  - Many funds no longer offer B shares
- C Shares
  - No front end load
  - Usually charge a small back end load
  - Maximum 12b-1 fee of 1%

Exchange Traded Funds

- Portfolios of stock that represent an index.
- Tax efficient
- Traded on an exchange similar to stocks
- Don't have to buy and sell blindly
- Low cost of ownership
- Examples include:
  - QQQ → NASDAQ 100
  - SPY → S&P 500

Real Estate Investment Trusts (REITs)

- Attractive because of low correlation with stock market
- Similar to a closed end mutual fund
- Must distribute 90% of investment income to shareholders to maintain tax exempt status
- Three types:
  - Equity
    - Invest in real estate for capital appreciation
    - Income is generated from rental income and appreciation
  - Mortgage
    - Invest mostly in mortgages and construction loans
    - Make the spread between the lending and borrowing rate
  - Hybrid
    - Combo of both equity and mortgage

American Depository Receipts

- ADR's represent foreign stock held in domestic bank's foreign branch.
- ADR's entitle the shareholder to dividends and capital gains.
  - Capital gains in ADR's include currency fluctuation
- ADR's trade on U.S. exchanges, are denominated in U.S. dollars and trade in U.S. dollars.
- Dividends are paid in U.S. dollars
- ADR's do not eliminate exchange rate risk.

Exam Tip: Must know that ADR's do not eliminate exchange rate risk!

Cryptocurrencies

- Virtual currency not associated with any country or central bank
- Number of “coins” are limited
- Not widely accepted as a form of payment
- Considered a high-risk investment

Cryptocurrencies - Suitability

From CFP Board:

Notice to CFP® professionals regarding financial advice about cryptocurrency related assets

- **Can be speculative and volatile investments,** and this volatility can have a particularly negative effect on investors;
- **Are difficult to analyze** and present challenges to CFP® professionals seeking to make informed investment decisions (with even knowledgeable investors experiencing difficulty evaluating these assets and separating “facts from the hype”);
- **May present unique custodial risks** that expose investors to heightened risk of theft or loss;
- **Raise valuation issues** because they may not be subject to commonly-accepted valuation methodologies and may not be subject to consistent accounting treatment or traditional reporting requirements;
- **May be unregistered** or otherwise offered by or through providers who are operating outside of or not complying with existing regulatory frameworks; and
- **May be subject to additional regulation**, which may evolve in unpredictable ways.

Options (1 of 3)

- An option is a derivative security.
- The value of the option depends on (is derived from) the value of another underlying asset.
- The option contract is a contractual agreement between two parties.
- There are two sides to every option transaction:
  - Seller (or writer) and
  - Buyer
- All transactions are handled through an option clearing house.
- There are two types of options, call options and put options.

Options (2 of 3)

A **call option** is the right to buy a specified number of shares at a specified price (strike or exercise price) within a specified period of time (American options) or at a specified future date (European options).

A **put option** is the right to sell a specified number of shares at a specified price (strike or exercise price) within a specified period of time (American options) or at a specified future date (European options).

There are three reasons people invest in options:

1. Hedging
2. Speculation
3. Income

Options (3 of 3)

Here is a diagram of what call option and put option transactions look like from both sides:

	Call Options	Put Options
Buyers:	Believe the price of underlying stock will ***fall.***	Believe the price of underlying stock will ***rise.***
Sellers:	Believe the price of underlying stock will ***fall or stay the same.***	Believe the price of underlying stock will ***rise or stay the same***.

Options – Call

- Option premium consists of intrinsic value and time value
  - Intrinsic Value
    - Call Option: Stock Price – Strike Price
    - Put Option: Strike Price – Stock Price
      - Intrinsic value can not be less than 0
  - Time Value = Premium – Intrinsic Value

Exam Tip: A call option is most likely to be tested!

Options – Call Example

Holly purchases a call option on Starbucks. The strike price is $50 and the stock is trading at $53. The call expires in two months and the premium is $5. What is the intrinsic value of her call option?

Call Option Intrinsic Value: Stock Price – Strike Price

Intrinsic Value = 53 – 50

Intrinsic Value = $3

Time Component = $5 – 3 = $2

Options – Put

- Option premium consists of intrinsic value and time value
  - Intrinsic Value
    - Call Option: Stock Price – Strike Price
    - Put Option: Strike Price – Stock Price
      - Intrinsic value can not be less than 0
  - Time Value = Premium – Intrinsic Value

Options – Put Example

Holly purchases a put option on Starbucks. The strike price is $50 and the stock is trading at $40. The put expires in two months and the premium is $13. What is the intrinsic value of her put option?

Put Option Intrinsic Value: Strike Price – Stock Price

Intrinsic Value = 50 – 40

Intrinsic Value = $10

Time Component = $13 – 10 = $3

Options Values

	In The Money	At The Money*	Out of the Money*
Call	Stock Price > Strike Price	Stock Price = Strike Price	Stock Price < Strike Price
Put	Stock Price < Strike Price	Stock Price = Strike Price	Stock Price > Strike Price

Exam Tip: * At & Out of the money options have an intrinsic value = 0

Portfolio Insurance

- Portfolio insurance is using put options on an index to “lock-in” portfolio gains
- Typically the investor will have a well diversified portfolio and is concerned about a down turn in markets.
- Purchasing put options on the S&P 500 will protect a well diversified portfolio from a down-turn in the markets.

Straddles

- Long Straddle
  - An investor buys a put and a call option
  - Investor expects volatility, just not sure which direction
- Short Straddle
  - An investor sells a put and a call option
  - Investor does not expect volatility, just hoping to keep the premiums

Option Pricing Models (1 of 2)

- Black/Scholes
  - Model used to determine the value of a CALL option
  - Considers the following variables:
    - Current price of the underlying asset
    - Time until expiration
    - The risk-free rate of return
    - Volatility of the underlying asset
    - Strike (exercise) price
  - All variables have a direct relationship on the price of the option, except the strike price. The higher the strike price, the smaller the call option premium.

Option Pricing Models (2 of 2)

- Put/Call Parity
  - Attempts to value a PUT option based on the value of a call option
- Binomial Pricing Model
  - Attempts to value an option based on the assumption that a stock can only move in one of two directions

Exam Tip: Make a flashcard for all pricing models & know the variables under the Black/Scholes Model!

Warrants

- Warrants are essentially call options issued by the corporation
  - Call options written by investors
- Expiration period is much longer than options, usually 5-10 years
  - Call options have expiration periods of nine months or less
- Warrant terms are NOT standardized
  - Call option contracts are standardized

Exam Tip: Know the differences between call options and warrants!

Practice Question 29

A call option with a strike price of $110 is selling for $3.50 when the market price of the underlying stock is $108. The intrinsic value of the call is: (CFP® Certification Examination, released 3/95)

A. 0
B. $1.50
C. $2
D. $3.50

Practice Question 30

A client purchased 100 shares of Yahoo at $30. Yahoo is now trading at $42. If the client sold the stock at $42 and a few weeks later bought a put with a strike price of $40 for $1, how much would the client make (in total) if the client sold the put at option expiration when the stock was trading at $35?

A. $1,600
B. $1,200
C. $1,100
D. $400

Practice Question 31

Joe sells a naked call option for a premium of $5. The call has an exercise price of $50. Which of the following statements is true?

A. Joe's maximum gain potential is $50
B. Joe's maximum loss potential is $45
C. Joe's maximum gain potential is unlimited
D. Joe's maximum loss potential is unlimited

Futures Contracts

- Commodity
  - Copper, wheat, pork bellies, oil
- Financial
  - Currency, interest rate and stock indexes
- Differences between futures and option contracts
  - Option contracts give the holder the "right" to do something
  - Futures contracts "obligate" the holder to make or take deliver of the underlying asset
  - Futures contracts do not state the per unit price of the underlying asset

Exam Tip: Know the differences between futures and option contracts!

Process of Hedging a Position

- To better understand the commodities process, a closer look through example may be very helpful:
- Position 1 - Long the commodity, Short the contract:
  - An orange grove owner has production costs and knows the price he must receive per bushel to make a profit, given these costs. The future orange price is unknown, but the current price for a contract for future delivery is known. The owner sells a contract for future delivery as a hedge position. He is long the commodity (the oranges in the trees), and short the futures contract to lock in his sale price.

Process of Hedging a Position (Cont.)

- Position 2 - Short the commodity, Long the contract:
  - A manufacturer of orange juice (user of oranges) hedges in the opposite direction. The juice maker buys a futures contract and has a long position in the contract and a short position in the manufacturing costs of juice in the future.

Futures Example

Farmer Shorts & Covers

- Price at Short = $50
- Price at Delivery: $60
  - Farmer pays $60 to buy back contract & loses $10
  - Farmer sells for $60
  - Net = $50

Producer Buys & Covers

- Price at Purchase = $50
- Price at Delivery: $60
  - Producer sells contract at $60 and makes a profit of $10
  - Producer buys commodity at $60
  - Net = $50

Practice Question 32

A money fund manager in Germany, is concerned about a decrease in the Euro. What should the fund manager do?

A. Purchase a futures contract on the Euro
B. Buy a futures contract on the US Dollar
C. Sell a futures contract on the US Dollar
D. Sell a futures contract on the Euro

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