CAIA® Level I Study Guide

September 2020

Chartered Alternative Investment Analyst Association®

CAIA Level I Study Guide

For the September 2020 Exam

Contents

Introduction to the Level I Program

Congratulations on becoming a Chartered Alternative Investment Analyst℠ (CAIA) Candidate, and welcome to Level I of the CAIA® Charter program. The CAIA Charter program is organized by the CAIA Association®, which was co-founded by the Alternative Investment Management Association (AIMA) and the Isenberg School Center for International Securities and Derivatives Markets (CISDM). It is the only globally recognized professional designation in the area of alternative investments, the fastest growing segment of the investment industry.

The CAIA curriculum provides breadth and depth by first placing emphasis on understanding alternative asset classes and then by building applications in manager selection, risk management, and asset allocation. In the CAIA Charter program, candidates work through the curriculum to identify and describe various asset classes, risk-return characteristics of each asset class, the role of each class in a diversified portfolio, the role of active management in investment processes, the manager selection method, and risk management.

The business school faculty and industry practitioners who have helped create the CAIA Charter program bring years of experience in the financial services industry. Consequently, the curriculum is consistent with recent advances in the financial industry and reflects findings of applied academic research in the area of investment management.

Passing the Level I examination is an important accomplishment and will require a significant amount of preparation. All candidates will need to study and become familiar with the CAIA Level I curriculum material in order to develop the knowledge and skills necessary to be successful on examination day.

Our study guides are organized to facilitate quick learning and easy retention. Each topic is structured around learning objectives and keywords that define the content that is eligible to be measured on the exam. The learning objectives and keywords are an important way for candidates to organize their study, as they form the basis for examination questions. All learning objectives reflect content in the CAIA curriculum and all exam questions are written to directly address the learning objectives. A candidate who is able to meet all learning objectives in the study guide should be well prepared for the exam. For these reasons, we believe that the CAIA Association has built a rigorous program with high standards, while also maintaining an awareness of the value of candidates' time.

Candidates for the CAIA Level I exam are assumed to have an understanding of the central concepts of quantitative analysis and finance. This includes awareness of the instruments that trade in traditional markets, models used to value these instruments, and the tools and methods used to analyze data. These concepts are typically covered in dedicated undergraduate courses or MBA-level investment and business statistics courses.

Preparing for the Level I Examination

Candidates should obtain all the reading materials and follow the outline provided in this study guide. The reading materials for the Level I curriculum are:

- *Standards of Practice Handbook*, 11th edition, CFA Institute, 2014. ISBN 978-0-938367-85-7.
- *Alternative Investments: CAIA Level I,* 4th edition, Wiley, 2020. ISBN 978-1-119-60414-3 (hardback);

The learning objectives in this study guide are an important way for candidates to organize their study, as they form the basis for the examination questions. Learning objectives provide guidance on the concepts and keywords that are most important to understanding the CAIA curriculum. Candidates should be able to define all keywords provided, whether or not they are stated explicitly in a learning objective.

The action words used within the learning objectives help candidates determine what they need to learn from the relevant passages and what type of questions they may expect to see on the examination. Note that actual examination questions are not limited in scope to the exact action word used within the learning objectives. For example, the action words "demonstrate knowledge" could result in examination questions that ask candidates to define, explain, calculate, and so forth. A list of action words used within learning objectives is provided in the back of this study guide in the Action Words table.

Candidates should be aware that all equations in the readings are important to understand and that an equation sheet will not be provided on the exam. The equation exception list at the end of this study guide contains equations that serve as exceptions and will be provided if needed to answer a specific question. For example, a question asking candidates to describe the implication of large excess kurtosis can be answered without having access to the kurtosis formula. On the other hand, a question asking candidates to calculate the excess kurtosis of a return series would require the excess kurtosis equation.

Preparation Time

Regarding the amount of time necessary to devote to the program, we understand that all candidates are different. Therefore, it is nearly impossible to provide guidelines that would be appropriate for everyone. However, based on candidate feedback we estimate that Level I requires 200 hours or more of study.

Examination Format

The Level I examination, administered twice annually, is a four-hour computer-administered examination that is offered at test centers throughout the world. The Level I examination is composed of 200 multiple-choice questions, fewer than 30% of which will require calculations. For more information, visit the CAIA website at www.caia.org.

Level I Examination Topic Weights

Level I Topic	Approximate Exam Weight
Professional Standards and Ethics	15% - 25%
Introduction to Alternative Investments	20% - 28%
Real Assets	11% - 17%
Hedge Funds	12% - 20%
Private Equity	11% - 17%
Structured Products	10% - 14%

Errata Sheet

Correction notes appear in this study guide to address known errors existing in the assigned readings. Occasionally, additional errors in the readings and learning objectives are brought to our attention and we will then post the errata on the Curriculum and Study Materials page of the CAIA website: https://caia.org/content/curriculum-study-tools?qt-curriculum_study_tools_quicktab=0 . It is the responsibility of the candidate to review these errata prior to taking the examination. Please report suspected errata to curriculum@caia.org.

Calculator Policy

You will need to bring a calculator for the Level I examination. The calculations that candidates are asked to perform range from simple mathematical operations to more complex methods of valuation. The CAIA Association allows candidates to bring into the examination the TI BA II Plus (including the Professional model) or the HP 12C (including the Platinum edition). **No other calculators or any other electronic devices will be allowed in the testing center, and calculators will not be provided at the test center.**

The Level II Examination and Completion of the Program

A separate study guide is available for the Level II curriculum. As with the Level I examination, the CAIA Association administers the Level II examination twice annually. Upon successful completion of the Level II examination, and assuming that the candidate has met all the Association's membership requirements, the CAIA Association will confer the CAIA Charter upon the candidate. Candidates should refer to the CAIA website, www.caia.org, for information about examination dates and membership requirements.

CAIA Level I Outline

Topic 1: Professional Standards and Ethics

Standards of Practice Handbook, 11th Edition, CFA Institute, 2014.

Standard I: Professionalism
Standard II: Integrity of Capital Markets
Standard III: Duties to Clients
Standard IV: Duties to Employers
Standard V: Investment Analysis, Recommendations, and Actions
Standard VI: Conflicts of Interest

Topic 2: Introduction to Alternative Investments

Alternative Investments: CAIA Level I, Fourth Edition, Wiley, 2020. Part One: Introduction to Alternative Investments, Chapters 1 – 8.

Chapter 1: What is an Alternative Investment?
Chapter 2: The Environment of Alternative Investments
Chapter 3: Quantitative Foundations
Chapter 4: Statistical Foundations
Chapter 5: Foundations of Financial Economics
Chapter 6: Derivatives and Risk-Neutral Valuation
Chapter 7: Measures of Risk and Performance
Chapter 8: Alpha, Beta, and Hypothesis Testing

Topic 3: Real Assets

Alternative Investments: CAIA Level I, Fourth Edition, Wiley, 2020. Part Two: Real Assets, Chapters 9 – 13.

Chapter 9: Natural Resources and Land
Chapter 10: Commodities
Chapter 11: Other Real Assets
Chapter 12: Real Estate and Debt
Chapter 13: Real Estate Equity

Topic 4: Hedge Funds

Alternative Investments: CAIA Level I, Fourth Edition, Wiley, 2020. Part Three: Hedge Funds, Chapters 14 – 19.

Chapter 14: Structure of the Hedge Fund Industry
Chapter 15: Macro and Managed Futures Funds
Chapter 16: Event-Driven Hedge Funds
Chapter 17: Relative Value Hedge Funds
Chapter 18: Equity Hedge Funds
Chapter 19: Funds of Hedge Funds

Topic 5: Private Equity

Alternative Investments: CAIA Level I, Fourth Edition, Wiley, 2020. Part Four: Private Equity, Chapters 20 – 22.

Chapter 20: Private Equity Assets
Chapter 21: Private Equity Funds
Chapter 22: Private Credit and Distressed Debt

Topic 6: Structured Products

Alternative Investments: CAIA Level I, Fourth Edition, Wiley, 2020. Part Five: Structured Products, Chapters 23 – 26.

Chapter 23: Introduction to Structuring
Chapter 24: Credit Risk and Credit Derivatives
Chapter 25: CDO Structuring of Credit Risk
Chapter 26: Equity-Linked Structured Products

Topic I: Professional Standards & Ethics

Readings

Standards of Practice Handbook, 11th Edition, CFA Institute, 2014.

Learning Objectives

A.1 Demonstrate knowledge of Standard I: Professionalism.

For example:

- State and interpret Standard I with respect to knowledge of the law, independence and objectivity, misrepresentation, and misconduct
- Recognize procedures for compliance with respect to knowledge of the law, independence and objectivity, misrepresentation, and misconduct

A.2 Demonstrate knowledge of Standard II: Integrity of Capital Markets.

For example:

- State and interpret Standard II with respect to material nonpublic information, and market manipulation
- Recognize procedures for compliance with respect to material nonpublic information

A.3 Demonstrate knowledge of Standard III: Duties to Clients.

For example:

- State and interpret Standard III with respect to loyalty, prudence and care, fair dealing, suitability, performance presentation, and preservation of confidentiality
- Recognize procedures for compliance with respect to loyalty, prudence and care, fair dealing, suitability, performance presentation, and preservation of confidentiality

A.4 Demonstrate knowledge of Standard IV: Duties to Employers.

For example:

- State and interpret Standard IV with respect to loyalty, additional compensation arrangements, and responsibilities of supervisors
- Recognize procedures for compliance with respect to additional compensation arrangements, and responsibilities of supervisors

A.5 Demonstrate knowledge of Standard V: Investments Analysis, Recommendations, and Actions.

For example:

- State and interpret Standard V with respect to diligence and reasonable basis, communication with clients and prospective clients, and record retention
- Recognize procedures for compliance with respect to diligence and reasonable basis, communication with clients and prospective clients, and record retention

A.6 Demonstrate knowledge of Standard VI: Conflicts of Interest.

For example:

- State and interpret Standard VI with respect to disclosure of conflicts, priority of transactions, and referral fees
- Recognize procedures for compliance with respect to disclosure of conflicts, priority of transactions, and referral fees

Topic II: Introduction to Alternative Investments

Readings

Alternative Investments: CAIA Level I, Fourth Edition, Wiley, 2020. Part One: Introduction to Alternative Investments, Chapters 1 – 8.

Chapter 1
What Is an Alternative Investment?

Keywords:

absolute return products
absolute return standard
active management
active return
active risk
alternative investments
benchmark
benchmark return
commodities
compensation structure
distressed debt
diversifier
efficiency
farmland
financial asset
hedge fund
illiquidity
incomplete markets
inefficiency
information asymmetries
infrastructure investments
innovation
institutional factors
institutional-quality investment
investment
land
lumpy assets
mezzanine debt
moral hazard
operationally focused real assets
passive investing
private equity
pure arbitrage
real assets
real estate
regulatory factors
relative return standard
return diversifier
return enhancer
structured products
structuring
timberland
trading strategies
traditional investments

Learning Objectives

1.1 Demonstrate knowledge of the view of alternative investments by exclusion.
For example:
- Recognize characteristics of institutional quality investments.

1.2 Demonstrate knowledge of various alternative investment types.
For example:
- Describe real assets (i.e., commodities, real estate, intellectual property, and infrastructure), and distinguish real assets from financial assets
- Describe hedge funds
- Describe private equity (i.e., venture capital, leveraged buyouts, mezzanine debt, distressed debt, and private debt)
- Describe structured products (e.g., collateralized debt obligations [CDOs}, credit derivatives)

1.3 Demonstrate knowledge of the defining characteristics of alternative investments.

For example:

- Recognize that the lines between traditional and alternative investments are not distinct and universal
- Understand which categories of investments are generally qualified as traditional, generally qualified as alternative, and which can be placed under both

1.4 Demonstrate knowledge of the history of alternative investments in the United States.

For example:

- Understand how assets typically held by institutional investors have transformed over time

1.5 Demonstrate knowledge of how alternative and traditional investments are distinguished by return characteristics.

For example:

- Recognize the role of absolute return products as diversifiers
- Define illiquidity, and describe the advantages and risks of illiquid investments
- Define efficiency and inefficiency, and describe their relationship to competition and transaction costs
- Recognize normal and non-normal distributions and the structures that cause non-normality of returns

1.6 Demonstrate knowledge of how alternative and traditional investments are distinguished by methods of analysis.

For example:

- Recognize return computation methods
- Recognize statistical methods
- Recognize valuation methods
- Recognize portfolio management methods

1.7 Demonstrate knowledge of other characteristics that distinguish alternative investments from traditional investments.

For example:

- Describe regulatory factors and their role in alternative investments
- Define how cash flow claims can be partitioned
- Describe trading strategies and how they determine the investments' characteristics
- Describe compensation structures within alternative investments and their implications
- Recognize institutional factors and their implications in trading
- Define information asymmetries and their issues within financial analysis and portfolio management
- Explain incomplete markets and their challenges
- Explain the influences of innovation on alternative investments

1.8 Demonstrate knowledge of the goals of alternative investing.

For example:

- Define active management, and contrast active management to passive investing
- Recognize the role of benchmarks in managing investments
- Define active risk and active return
- Describe the absolute and relative standards for evaluating returns
- Describe the concept of arbitrage, and contrast pure arbitrage with arbitrage as an active absolute return strategy

- Understand the distinction between the goal of return enhancement and return diversification in an investment program

1.9 Demonstrate knowledge of the two pillars of alternative investment management

For example:

- Understand how empirical analysis is used to determine which new types of assets to include in a portfolio
- Understand how economic reasoning is used to determine which new types of assets to include in a portfolio
- Describe how alternative investment categories can be placed within a 2X2 framework

Chapter 2
The Environment of Alternative Investments

Keywords

40 Act funds
adverse selection
back office operations
bid-ask spread
bought in
buy side
closed-end mutual fund
commercial bank
consulting conflicts of interest
corporation
custodians
depositories
Depository Trust Company (DTC)
dividend irrelevancy
endowment
family office
feeder fund
financial data providers
financial platforms
financial software
foundation
fourth markets
front office operations
fund administrator
general collateral stocks
hedge fund infrastructure
hedge fund replication
investment bank
large dealer banks
limit orders
limited liability
limited liability company (LLC)
limited partner advisory committee (LPAC)
limited partnership agreement (LPA)
liquid alternatives
management company operating agreement
market making
market orders
market takers
master limited partnerships (MLPs)
master trust
master-feeder funds
middle office operations
mutual funds
partnership agreement
Passive investments
plan sponsor
primary market
prime broker
private limited partnerships
private-placement memoranda
Probity
progressive taxation
proprietary trading
qualified majority
rebate
secondary market
Section 1256 contracts
securitization
sell side
separately managed accounts
short selling
short squeeze
sovereign wealth funds
special purpose entity (SPE)
special purpose vehicle (SPV)
special stock
street name
subscription agreement
substitute dividends
systemic risk
third markets
universal banking

Learning Objectives

2.1 Demonstrate knowledge of the participants in the alternative investing environment.

For example:

- Identify buy-side participants (e.g., plan sponsors and foundations), and describe their roles in the alternative investing environment
- Identify sell-side participants (e.g., large dealer banks and brokers) and describe their roles in the alternative investing environment
- Identify outside service providers (e.g., prime brokers and accountants), and describe their roles in the alternative investing environment

2.2 Demonstrate knowledge of the legal structures in alternative investing.

For example:

- Describe the role of limited liability in passive investments
- Explain the role of entities (i.e., limited liability companies, corporations), and their purposes in alternative investing
- Describe limited partnership structures
- Identify bankruptcy remote entities (e.g., special purposes vehicles, special purpose entities), and explain their differences
- Recognize the structures of various entities (e.g., master-feeder funds, master trusts) that facilitate investor taxation differences

2.3 Demonstrate knowledge of the key features of fund structures.

For example:

- Recognize the four key documents (i.e., private-placement memoranda, partnership agreement, subscription agreement, management company operating agreement) used in establishing and maintaining a hedge fund, private equity fund, or other private partnerships
- Explain the importance and components of a limited partners agreement
- Identify and explain moral hazard and adverse selection
- Describe corporate governance in private funds
- Recognize components of investments objectives, fund size, and fund terms within an LPA
- Explain the role of management fees and expenses in how investments are managed
- Identify and explain global regulations (e.g., MiFID, MiFID II, AIFMD)
- Recognize global fund structures (e.g., FIFs, SICAV, SICAF, ICAV)

2.4 Demonstrate knowledge of the financial markets involved in alternative investments.

For example:

- Define primary capital markets, and describe their roles in alternative investments
- Define secondary capital markets, and describe their roles in alternative investments
- Define third, fourth, and private markets, and describe their roles in alternative investments

2.5 Demonstrate knowledge of the regulatory environment of alternative investments.

For example:

- Identify the five primary forms of hedge fund regulation

2.6 Demonstrate knowledge of liquid alternative investments.

For example:

- Define liquid alternative investments
- Recognize the spectrum of liquid alternative products and the five distinct types of alternative investments

- Describe the factors driving the growth of liquid alternative investments
- Recognize the regulatory constraints that affect liquid alternative investments
- Recognize the main factors that contribute to the differences between the returns of private placement vehicles and those of alternative investments

2.7 Demonstrate knowledge of taxation of investments.

For example:

- Recognize income tax conventions (e.g., taxes on capital gains, dividends, interest)
- Recognize non-income tax conventions (e.g., real estate tax, estate tax, value-added tax)
- Recognize how variations in income tax conventions around the world affect investments and investment decisions

2.8 Demonstrate knowledge of short-selling processes and mechanics.

For example:

- Identify and explain the mechanics of institutional short-selling
- Identify and explain the mechanics of short-selling to the short-seller
- Identify special situations involving short-selling

Chapter 3
Quantitative Foundations

Keywords

accounting convention of conservatism
aggregation of IRRs
borrowing type cash flow pattern
carried interest
catch-up provision
catch-up rate
clawback
compensation scheme
complex cash flow pattern
continuous compounding
deal-by-deal carried interest
discrete compounding
distribution to paid-in (DPI) ratio
dollar-weighted returns
Financial Accounting Standard (FAS) 157
fully collateralized
fund-as-a-whole carried interest
hard hurdle rate
hurdle rate
incentive fee
interim IRR
internal rate of return (IRR)
J-curve
lifetime IRR
log return
Management fee offsets
management fees
modified IRR
multiple sign change cash flow pattern
notional principal
partially collateralized
performance-based fee
preferred return
Public Market Equivalent (PME) Method
reinvestment rate assumption
residual value to paid-in (DPI) ratio
return computation interval
return on notional principal
scale differences
simple interest
since-inception IRR
soft hurdle rate
time-weighted returns
total value to paid-in (DPI) ratio
vesting
waterfall

Learning Objectives

3.1 Demonstrate knowledge of return and rate mathematics.

For example:

- Distinguish simple from compound interest and discrete from continuous compounding
- Define and calculate logarithmic returns
- Understand the concept of return computation interval
- Aggregate returns over different time intervals
- Define and apply both arithmetic mean log returns and geometric mean returns

3.2 Demonstrate knowledge of returns based on notional principal.

For example:

- Understand the challenge of calculating returns on positions with zero value
- Define and apply the concepts of notional principal and full collateralization for forward contracts
- Calculate the log return on a fully collateralized derivatives position
- Calculate the log return on a partially collateralized derivatives position

3.3 Demonstrate knowledge of the internal rate of return (IRR) approach to alternative investment analysis

For example:

- Define and calculate the IRR
- Contrast the different IRR measurement intervals
- Define and calculate three types of IRRs based on the time periods for which cash flows are available (i.e., lifetime, interim, and since inception)

3.4 Demonstrate knowledge of the problems associated with the internal rate of return (IRR).

For example:

- Recognize complex cash flow patterns and discuss their effect on the computation and interpretation of IRRs
- Explain challenges of comparing investments based on IRRs
- Discuss the difficulties of aggregating IRRs
- Recognize the relationship between IRR and the reinvestment rate assumption
- Define and apply the modified internal rate of return approach
- Identify advantages and disadvantages of modified internal rate of return
- Compare and calculate time-weighted and dollar-weighted returns

3.5 Demonstrate knowledge of other performance measures associated with illiquid investments.

For example:

- Recognize and define three ratios that can be used as performance measures
- Explain the Public Market Equivalent (PME) method

3.6 Demonstrate knowledge of illiquidity, accounting conservatism, IRR, and the J-Curve as they relate to the valuation of alternative investments.

For example:

- Identify how accounting conservatism relates to early fund losses
- Identify the implication of accounting conservatism on deferred recognition of gains
- Recognize and interpret the J-Curve

3.7 Demonstrate knowledge of the distribution of cash waterfall.

For example:

- Explain the distribution of cash waterfall provision of a limited partnership agreement
- Recognize terminology associated with the cash waterfall provision (e.g., carried interest, hurdle rate, catch-up provision, vesting, clawback clause)
- Discuss factors (e.g., management fees, incentive-based fees) to consider in a fund's compensation structure and the potential effects of decisions regarding compensation structure
- Discuss and calculate fund-as-a-whole carried interest and deal-by-deal carried interest
- Define and apply clawback provisions
- Compare and apply hard and soft hurdle rates and their sequences of distribution
- Discuss the potential effects of incentive fees on decision-making, and their optionlike nature

Chapter 4
Statistical Foundations

Keywords

ARCH
autocorrelation
autoregressive
beta
central limit theorem
conditionally heteroskedastic
correlation coefficient
covariance
ex ante returns
ex post returns
excess kurtosis
first-order autocorrelation
GARCH
heteroskedasticity
homoskedasticity
Jarque-Bera test
kurtosis
leptokurtosis
lognormal distribution
mean
mesokurtosis
normal distribution
partial autocorrelation coefficient
perfect linear negative correlation
perfect linear positive correlation
platykurtosis
skewness
Spearman rank correlation
standard deviation
variance
volatility

Learning Objectives

4.1 Demonstrate knowledge of the characteristics of return distributions.
For example:
- Recognize ex ante and ex post return distributions
- Understand the importance of the normal distribution in statistical analysis
- Describe the characteristics of lognormal distributions

4.2 Demonstrate knowledge of moments of return distributions (i.e., mean, variance, skewness, and kurtosis).
For example:
- Explain the first four raw moments of return distributions
- Explain the central moments of return distributions
- Explain skewness of return distributions
- Explain kurtosis and excess kurtosis of return distributions
- Describe the characteristics of platykurtic, mesokurtic, and leptokurtic distributions

4.3 Demonstrate knowledge of various measures of correlation of returns.
For example:
- Recognize the importance of correlation in alternative investment portfolio management
- Define and calculate covariance
- Define and calculate correlation coefficient
- Define and calculate the Spearman rank correlation coefficient
- Discuss the role of correlation in portfolio diversification
- Define and calculate beta in the context of the CAPM
- Define and calculate autocorrelation
- Define and calculate higher-order autocorrelation and partial autocorrelation
- Define and apply the Durbin-Watson test

4.4 Demonstrate knowledge of standard deviation (volatility) and variance.

For example:

- Define and explain standard deviation (volatility)
- Describe the properties of variance and standard deviation
- Calculate variance and standard deviation

4.5 Demonstrate knowledge of methods used to test for normality of distributions.

For example:

- Recognize the three main reasons for non-normality observed in alternative investment returns (i.e., autocorrelation, illiquidity, and nonlinearity), and discuss the effect of each on returns
- Discuss tests for normality that use sample moments
- Recognize and apply the Jarque-Bera test

4.6 Demonstrate knowledge of time-series return volatility models.

For example:

- Define the concepts of heteroskedasticity and homoskedasticity
- Recognize the key components of the generalized autoregressive conditional heteroskedasticity (GARCH) method
- Describe how the GARCH method is used to model risk evolution through time
- Contrast the GARCH method with the autoregressive conditional heteroskedasticity (ARCH) method

Chapter 5
Foundations of Financial Economics

Keywords

absolute pricing model
anticipated inflation rate
arbitrage
arbitrage-free model
asset pricing model
binomial tree
capital asset pricing model (CAPM)
cash market
duration
duration of a fixed coupon bond
ex ante models
ex post model
excess return
Fisher effect or Fisher equation
idiosyncratic return
idiosyncratic risk
implied forward rate
inflation
informational market efficiency
interest rate immunization
key externality of arbitrage activities
liquidity preference theory
market portfolio
market segmentation theory
market weight
modified Fisher equation
nominal interest rate
real interest rate
recombining binomial tree
relative pricing model
risk-neutral model
semistrong form informational market efficiency
single-factor asset pricing model
spot market
strong form informational market efficiency
systematic return
systematic risk
term structure of implied forward rates
term structure of interest rates
unbiased expectations theory
weak form informational market efficiency
yield to maturity

Learning Objectives

5.1 Demonstrate knowledge of the concept of informational market efficiency.
For example:
- Define informational market efficiency
- Recognize various forms of informational market efficiency, including efficient inefficiency
- Identify factors driving informational market efficiency
- Discuss the factors influencing informational efficiency in alternative asset markets

5.2 Demonstrate knowledge of the time value of money, prices, and rates.
For example:
- Understand zero-coupon bonds and its present value function
- Define and calculate interest rates from zero coupon bond prices
- Determine and calculate short-term interest rates using the Fisher equation
- Estimate the term structure of interest rates with zero-coupon bonds
- Understand how the bond pricing formula is used to calculate bond yields
- Estimate (i.e. bootstrap) the term structure of interest rates with coupon bonds

5.3 Demonstrate knowledge of the three primary theories of the term structure of interest rates.

For example:

- Define the unbiased expectations theory
- Define the liquidity preference theory
- Define the market segmentation theory
- Understand the managerial implications of the three term structure theories

5.4 Demonstrate knowledge of forward interest rates.

For example:

- Define and apply implied forward rates using incremental cash flows
- Calculate implied forward rates with annual and continuous compounding
- Explain the term structure of implied forward rates

5.5 Demonstrate knowledge of arbitrage-free financial models.

For example:

- Describe arbitrage-free models
- Discuss applications of arbitrage-free models
- Describe arbitrage-free pricing in spot markets
- Describe hedged and unhedged carry trades

5.6 Demonstrate knowledge of binominal tree models.

For example:

- Understand and explain the mechanics of binomial trees
- Explain the differences between a binomial tree and a recombining binomial tree
- Show how a simplified binomial tree can use stock prices to model the value of a call option
- Explain risk-neutral models and when they are appropriate to employ
- Identify the advantages of binomial tree models

5.7 Demonstrate knowledge of single factor default-free bond models.

For example:

- Define traditional duration
- Interpret duration in the case of a fixed coupon bond
- Interpret and apply the duration for a bond portfolio
- Describe how the duration of a long-only bond portfolio can be used to manage interest rate risk
- Identify challenges and solutions for using duration when cash flows are stochastic
- Explain duration as it relates to the longevity of a zero-coupon bond
- Discuss and apply hedging or immunizing a long-short portfolio with duration through time
- Explain extensions to traditional duration

5.8 Demonstrate knowledge of single factor equity pricing models.

For example:

- Define an asset pricing model
- Interpret and apply a single-factor asset pricing model (e.g. the capital asset pricing model (CAPM))
- Describe ex ante forms of the CAPM and their implications
- Describe ex post forms of the CAPM and their applications

Chapter 6
Derivatives and Risk-Neutral Valuation

Keywords

bear spread
Black-Scholes call option formula
bull spread
carrying cost
convenience yield
cost of carry
cost-of-carry model
covered call
crisis at maturity
distant contracts
elasticity
financed positions
forward contract
forward rate agreement (FRA)
front month contract
initial margin
lambda
maintenance margin requirement
margin call
marginal market participant
marked-to-market
naked option
omega
omicron
open interest
option collar
option combination
option spread
option straddle
option strangle
protective put
put-call parity
ratio spreads
reference rate
rho
risk reversal
rolling contracts
storage costs
swap

Learning Objectives

6.1 Demonstrate knowledge of foundations of forward contracts.
For example:
- Describe the settlement and delivery processes of forward contracts
- Understand the no-arbitrage approach to determining forward prices
- Determine the forward contract price of a zero-coupon default-free bond
- Analyze forward prices and expected spot prices under risk neutrality
- Understand forward prices and expected bond rates under different term structure theories

6.2 Demonstrate knowledge of the impacts of forward contracts on rates.
For example:
- Describe the forward rate agreement (FRA) process
- Understand and apply the relationship between FRAs and implied forward interest rates
- Explain forward rates and their extensions

6.3 Demonstrate knowledge of the impacts of forward contracts on equities.

For example:

- Understand the concept of a forward contract price of a stock that pays no dividends
- Calculate the no-arbitrage forward price of a stock
- Discuss riskless interest rates and their relationship with risk neutrality in forward prices
- Discuss the forward prices of financial assets given the riskless interest rate
- Determine the forward contract price of a stock with dividends
- Understand how forward curves for stocks can be derived under four distinct cases (no dividends and no financing costs, dividend rates equal to financing costs, dividend rates less than financing costs, and dividend rates exceeding financing costs)

6.4 Demonstrate knowledge of the impact of forward contracts on assets with benefits and costs of carry.

For example:

- Discuss the benefits and costs of carrying (i.e. holding) a cash position and the incorporation of convenience yields and storage costs in cost of carry models
- Calculate the forward price of a commodity
- Identify and discuss four factors that differentiate forward pricing on financial assets with those of physical assets
- Understand challenges involving measuring storage costs and convenience yields
- Discuss the difficulties of short-selling physical assets and the resulting implication to the formula for forward prices
- Calculate forward contracts with non-zero market value

6.5 Demonstrate knowledge of forward and futures contracts.

For example:

- Describe the trading differences between forward and futures contracts
- Describe and apply the marking-to-market process for futures positions
- Discuss the effect of marking-to-market on counterparty risk
- Recognize the effect of marking-to-market and the time value of money on risk and on prices
- Define and calculate initial margin for futures positions
- Define and calculate maintenance margin for futures positions

6.6 Demonstrate knowledge of managing long-term futures exposures.

For example:

- Discuss futures contracts with different settlement dates
- Understand how rollover decisions alter long-run returns

6.7 Demonstrate knowledge of option exposures.

For example:

- Understand option risk exposure diagrams
- Recognize the key characteristics of long and short positions in an underlying asset
- Recognize the key characteristics of call and put exposures
- Recognize the key characteristics of protective put exposures
- Discuss characteristics of option spreads (e.g., bull spreads, bear spreads, and ratio spreads)
- Recognize the key characteristics of option combinations (e.g., straddles, strangles, and the concept of risk reversals)
- Define and apply the concepts of option collars and of put-call parity

6.8 Demonstrate knowledge of option pricing models.

For example:

- Understand the concept of an option on a portfolio
- Recognize and apply the Black-Scholes call-option formula
- Recognize and apply the Black forward option pricing model
- Recognize and apply the currency option pricing model

6.9 Demonstrate knowledge of option sensitivities.

For example:

- Recognize and describe the five most popular option sensitivities (i.e., delta, vega, theta, rho, and gamma)
- Describe option sensitivities such as omicron, lambda, and omega
- Discuss the uses of option sensitivities in risk management

Chapter 7
Measures of Risk and Performance

Keywords

average tracking error
benchmarking
conditional value-at-risk
drawdown
information ratio
Jensen's alpha
M2 approach
maximum drawdown
Monte Carlo analysis
parametric VaR
peer group
performance attribution
return attribution
return on VaR (RoVaR)
semistandard deviation
semivariance
semivolatility
Sharpe ratio
shortfall risk
Sortino ratio
target semistandard deviation
target semivariance
tracking error
Treynor ratio
value at risk
well-diversified portfolio

Learning Objectives

7.1 Demonstrate knowledge of measures of risk.

For example:

- Define and calculate semivariance and semistandard deviation
- Define and calculate semivolatility
- Describe shortfall risk, target semivariance, and target semistandard deviation
- Define and calculate tracking error
- Describe and calculate drawdown
- Define and interpret value at risk (VaR) and conditional value-at-risk (CVaR)
- Discuss the strengths and weaknesses of VaR

7.2 Demonstrate knowledge of methods for estimating value at risk (VaR).

For example:

- Apply a parametric approach to estimate VaR with normally distributed returns or with normally distributed underlying factors
- Describe methods for estimating volatility as an input for VaR calculations
- Describe methods for estimating VaR for leptokurtic positions
- Describe methods for estimating VaR directly from historical data
- Describe how the Monte Carlo analysis can be used to estimate VaR
- Discuss and apply the aggregation of portfolio-component VaRs to determine the VaR for a portfolio under various assumptions (i.e., perfect correlation, zero correlation, and perfect negative correlation)

7.3 Demonstrate knowledge of benchmarking and performance attribution.

For example:

- Define benchmarking
- Identify types of benchmarks
- Discuss performance attribution

7.4 Demonstrate knowledge of ratio-based performance measures used in alternative investment analysis.

For example:

- Describe the two major types of performance measures
- Define and calculate the Sharpe ratio for different units of time (e.g. annual, semiannual, and quarterly)
- Understand four important properties of the Sharpe ratio
- Define and calculate the Treynor ratio
- Understand four important properties of the Treynor ratio
- Recognize and calculate the Sortino ratio, the information ratio, and return on VaR

7.5 Demonstrate knowledge of risk-adjusted performance measures used in alternative investment analysis.

For example:

- Define and calculate Jensen's Alpha
- Define and calculate the M^2 (M-Squared) approach
- Understand average tracking error

Chapter 8
Alpha, Beta, and Hypothesis Testing

Keywords

abnormal return persistence
alpha
alpha driver
alternative hypothesis
asset gatherers
backfill bias
backfilling
backtesting
beta creep
beta driver
beta expansion
beta nonstationarity
causality
cherry-picking
chumming
confidence interval
data dredging
data mining
dependent variable
economic significance
equity risk premium
equity risk premium puzzle
ex ante alpha
ex post alpha
full market cycle
goodness of fit
hypotheses
independent variable
intercept
linear risk exposure
Misetimated betas
model misspecification
Nonlinear risk-return relation error
null hypothesis
Omitted (more misidentified) systematic return factors
outlier
overfitting
passive beta driver
process drivers
product innovators
p-value
regression
residuals
return driver
r-squared
selection bias
self-selection bias
significance level
simple linear regression
slope coefficient
spurious correlation
survivorship bias
test statistic
t-statistic
t-test
type I error
type II error

Learning Objectives

8.1 Demonstrate knowledge of beta and alpha.

For example:

- Recognize the role of beta in the analysis of traditional and alternative investments
- Recognize the role of alpha in the analysis of traditional and alternative investments

8.2 Demonstrate knowledge of the concepts of ex ante and ex post alpha.

For example:

- Define and apply the concept of ex ante alpha, and identify its key characteristics
- Define and apply the concept of ex post alpha, and identify its key characteristics
- Distinguish between ex ante and ex post alpha

8.3 Demonstrate knowledge of single-factor regression models.

For example:

- Explain the simple linear regression and single-factor market model
- Explain the use of ordinary least squares to estimate regression parameters
- Describe the problem outliers pose to regression analysis
- Describe the problem autocorrelation poses to regression analysis
- Describe the problem heteroskedasticity poses to regression analysis
- Interpret a regression's goodness of fit
- Understand and apply the statistical significance of regression parameter estimates

8.4 Demonstrate knowledge of empirical approaches to inferring ex ante alpha from ex post alpha.

For example:

- Identify the steps involved in estimating ex ante alpha from historical performance
- Discuss how an experiment of a fair casino game can illustrate the challenges to empirical analysis of manager skill

8.5 Demonstrate knowledge of return attribution.

For example:

- Calculate beta, ex ante alpha, and ex post alpha
- Recognize the three primary types of model misspecification (i.e., omitted systematic return factors, misestimated betas, and nonlinear risk-return relationships) and their effects on return attribution
- Describe various types of beta nonstationarity (i.e., beta creep, beta expansion, and market timing) and their effects on return attribution
- Discuss how alpha and beta can become commingled

8.6 Demonstrate knowledge of ex ante alpha estimation and return persistence.

For example:

- Define abnormal return persistence
- Discuss attribution of idiosyncratic returns to luck or skill
- Interpret estimated return persistence

8.7 Demonstrate knowledge of return drivers.

For example:

- Discuss the classification of assets into beta drivers and alpha drivers
- Discuss the characteristics of beta drivers and their behavior over time
- Discuss passive beta drivers as pure plays on beta
- Discuss the characteristics of alpha drivers
- Discuss product innovators and process drivers

8.8 Demonstrate knowledge of statistical methods for locating alpha.

For example:

- Identify the four steps of hypothesis testing (i.e., state the hypothesis, formulate an analysis plan, analyze sample data, and interpret results)
- Discuss the error of accepting a hypothesis
- Recognize the four common problems with using inferential statistics (i.e., misinterpretation of high p-values, failure to distinguish between statistical significance and economic significance, violation of distributional assumptions, and misinterpretation of level of confidence)
- Define and discuss type I and type II errors in hypothesis testing
- Understand erroneous conclusions with Statistical Testing

8.9 Demonstrate knowledge of sampling and testing problems.

For example:

- Recognize the characteristics of unrepresentative data sets (e.g., selection bias, self-selection bias, survivorship bias) and their effects on test results
- Discuss data mining and data dredging, and recognize their effects on test results
- Discuss backtesting and backfilling, and recognize their effects on test results
- Discuss cherry-picking and chumming, and recognize their effects on test results

8.10 Demonstrate knowledge of statistical issues in analyzing alpha and beta.

For example:

- Recognize the effect of non-normality on the cross-sectional search for alpha
- Identify the potential effects of outliers on reported results
- Recognize issues involving biased testing in the search for alpha
- Discuss the challenges of spurious correlation and causality in beta estimation
- Recognize three major fallacies of alpha estimation and two major fallacies of beta estimation and the lessons that arise from them

Topic 3: Real Assets

Readings

Alternative Investments: CAIA Level I, Fourth Edition, Wiley, 2020. Part Two: Real Assets, Chapters 9 – 13.

Chapter 9
Natural Resources and Land

Keywords

agency risk
agronomy
binomial option pricing
blue top lots
cap rate
contagion
exchange option
favorable mark
finished lots
intrinsic option value
land banking
low-hanging-fruit principle
managed returns
market manipulation
model manipulation
natural resources
negative survivorship bias
paper lots
permanent cropland
perpetual option
political risk
pure play
Reduced integration in the forest products industry
risk-neutral probability
rotation
row cropland
selective appraisals
smoothing
split estate
stale prices
timberland investment management organizations (TIMOs)
time value of an option

Learning Objectives

9.1 Demonstrate knowledge of natural resources other than land.
For example:
- Discuss natural resources as an exchange option
- Discuss the concept of moneyness as it pertains to the development of natural resources
- Discuss why some in-the-money development options should not be immediately exercised
- Describe the relationship between the moneyness of natural resource options and short-term financial risks

9.2 Demonstrate knowledge of land as an alternative asset.
For example:
- Define land banking
- Describe the three types of land lots (i.e., paper lots, blue top lots, and finished lots)
- Discuss investment in undeveloped land as a call option
- Apply the binomial option pricing technique for valuing land as a call option
- Describe the risks and returns of investing in land
- Calculate the expected return of land investments

9.3 Demonstrate knowledge of timber and timberland as alternative assets.

For example:

- Discuss the characteristics of timber and timberland
- Discuss the role of timberland investment management organizations (TIMOs)
- Describe the risks and returns of timberland investments
- Identify methods of gaining exposure to timberland
- Explain benefits and disadvantages of timber investment

9.4 Demonstrate knowledge of farmland as an alternative asset.

For example:

- Discuss the characteristics of farmland investments
- Calculate the value of farmland based on annual operating income and the cap rate
- Understand the structure of farmland ownership and management
- Discuss supply and demand factors of agricultural products
- Identify three key benefits and three key disadvantages of farmland investment
- Identify methods of obtaining exposure to farmland
- Discuss the value and importance of assets with multiple purposes

9.5 Demonstrate knowledge of valuation and volatility of real assets.

For example:

- Discuss the smoothing of prices and returns
- Determine the effect of smoothing on observed volatility
- Identify the primary ways that returns can be managed
- Discuss how appraisals contribute to smoothing of real asset prices
- Compare smoothed returns with market returns

9.6 Demonstrate knowledge of pricing and historic data analysis.

For example:

- Interpret models of stale prices
- Describe and calculate the effect of stale pricing on historic mean returns
- Describe and calculate the effect of stale pricing on volatility

9.7 Demonstrate knowledge of contagion, price indices, and biases in real estate values.

For example:

- Discuss the reliability of market prices versus appraisal-based data
- Define contagion

9.8 Demonstrate knowledge of observations regarding historical returns of timberland.

For example:

- Summarize the key observations on historical timber returns that are consistent with economic reasoning

9.9 Demonstrate knowledge of observations regarding historical returns of farmland.

For example:

- Summarize the key observations on farmland returns that are consistent with economic reasoning

Chapter 10
Commodities

Keywords

backwardation
basis
basis risk
Bloomberg Commodity Index (BCOM)
calendar spread
collateral yield
commodity-linked note
contango
excess return of a futures contract
fully collateralized position
heterogeneous
Hotelling's theory
humped curve
inelastic demand
inelastic supply
inflation risk
inventory shrinkage
investable index
nominal price
normal backwardation
normal contango
perfectly elastic supply
production-weighted index
real price
roll return
roll yield
spoilage cost
spot return
Standard & Poor's GSCI (S&P GSCI)
stock-out
Thomson Reuters CoreCommodity Research Bureau (CRB) Index
volatility asymmetry
Working curve

Learning Objectives

10.1 Demonstrate knowledge of investing in commodities without futures.
For example:
- Discuss disadvantages of direct investment in physical commodities
- Define and interpret Hotelling's theory
- Explain Julian Simon's argument related to direct commodity returns
- Understand the idiosyncratic risks and two-betas of commodity-related equity returns
- Recognize investments in commodities through exchange-traded funds (ETFs)
- Discuss advantages and disadvantages of commodity-linked notes (CLNs)
- Apply option valuation methods to price commodity-linked notes

10.2 Demonstrate knowledge of the term structure of forward prices on commodities.
For example:
- Understand and calculate the costs of carry for commodities
- Define supply elasticity and how it relates to harvests and shifts in demand
- Define backwardation and contango with respect to the term structure of forward prices
- Explain backwardation and contango in relation to cost of carry in a perfect market
- Explain backwardation and contango in relation to cost of carry in an imperfect market
- Discuss the basis of forward and futures contracts
- Interpret calendar spreads on forward contracts
- Calculate the return on calendar spreads
- Discuss the risks of a calendar spread

10.3 Demonstrate knowledge of rolling of forward and futures contracts.

For example:

- Discuss why returns on a futures contract can differ from the spot return
- Understand the components of future returns and how they are calculated
- Understand differing interpretations of rolling contracts
- Explain roll yield and how it relate to the slope of a forward curve
- Explain roll yield, carrying costs, and the basis in the context of alpha
- Discuss how the strategy of rolling contracts affects return expectations
- Interpret the impact of rolling contracts on alpha
- Discuss three propositions regarding roll return

10.4 Demonstrate knowledge of normal backwardation and normal contango.

For example:

- Explain normal backwardation
- Explain normal contango
- Interpret normal backwardation and normal contango with respect to the risks and returns of commodities and forward contracts on commodities
- Discuss John Maynard Keynes' argument of normal backwardation
- Discuss commodity forward curves and how they relate to storage costs and inventory variation
- Define the market segmentation hypothesis and how it applies to commodity forward prices
- Interpret option-based models of the forward curve for commodities

10.5 Demonstrate knowledge of commodity exposure and diversification.

For example:

- Discuss four reasons why commodity returns may have low correlation with stock and bond prices
- Discuss commodities as diversifiers in a perfect market equilibrium
- Discuss commodities as diversifiers in the presence of market imperfections
- Discuss commodities as diversifiers against unexpected inflation

10.6 Demonstrate knowledge of expected returns on commodities.

For example:

- Interpret empirical evidence on long-run commodity price changes
- Interpret theoretical evidence on expected commodity returns
- Discuss irrelevancy of commodity price expectations to returns on futures contracts

10.7 Demonstrate knowledge of commodity indices.

For example:

- Discuss the process of construction of commodity futures indices
- Discuss the characteristics of commodity indices given by S&P GSCI, BCOM, and CRB
- Discuss production-weighted long only commodity indexes
- Discuss market liquidity-weighted long only commodity indexes
- Discuss tier-weighted long only commodity indices

10.8 Demonstrate knowledge of commodity risk attributes.

For example:

- Identify four favorable characteristics of commodities with respect to event risks
- Describe commodities as a defensive investment
- Discuss institutional investing demand and its effect on commodity prices

10.9 Demonstrate knowledge of observations regarding historical returns of commodities.

For example:

- Summarize the key observations on historical commodity returns that are consistent with economic reasoning

Chapter 11
Other Real Assets

Keywords

aesthetic benefit
brownfield phase
brownfield project
closed-end infrastructure funds
critical property of infrastructure
double taxation
downstream operations
economic infrastructure
evergreen funds
excludable good
gates
greenfield phase
greenfield project
intangible assets
intellectual property
investable infrastructure
mature intellectual property
midstream operations
negative costs
political infrastructure risk
privatization
public-private partnership (PPP)
regulated pricing
regulatory risk
social infrastructure
unbundled intellectual property
unrelated business income tax (UBIT)
upstream operations
visual works of art

Learning Objectives

11.1 Demonstrate knowledge of commodity producers.

For example:

- Describe how commodity prices drive the performance of an operating company
- Describe the empirical evidence between commodity prices and operating firms
- Discuss the empirical evidence on the correlation between commodity prices and equity prices of commodity-producing firms

11.2 Demonstrate knowledge of liquid alternative real assets.

For example:

- Describe the structure of master limited partnerships (MLPs) within the MLP sector
- Identify tax characteristics of MLPs
- Discuss valuations and distribution rates of MLPs

11.3 Demonstrate knowledge of infrastructure in the alternative investment space.

For example:

- Describe seven elements that help identify investable infrastructure
- Contrast economic infrastructure and social infrastructure
- Recognize the role of public-private partnerships in infrastructure investing
- Discuss the risks and government regulation of infrastructure investing
- Identify the stages of infrastructure investing
- Explain infrastructure investment vehicles
- Identify twelve detriments of infrastructure
- Discuss opportunities and allocations infrastructure investments

11.4 Demonstrate knowledge of intellectual property.

For example:

- Identify and discuss characteristics of intellectual property
- Identify six characteristics of real assets and how those relate to intellectual properties
- Understand and apply a simplified model of intellectual property

11.5 Demonstrate knowledge of cash flows of intellectual property.

For example:

- Discuss film production and its distribution revenues as an alternative investment
- Discuss film production and its distribution expenses as an alternative investment
- Discuss film financing in the context of investment
- Explain the profitability of film investment

11.6 Demonstrate knowledge of historical performance data on visual works of art.

For example:

- Discuss the historical performance data of visual works of art

11.7 Demonstrate knowledge of research and development and patents as unbundled intellectual property.

For example:

- Explain the process of accessing research and development via patents
- Discuss the process of patent acquisition and licensing strategies of patents
- Discuss the enforcement of patent law and various litigation strategies
- Identify patent sale license-back strategies
- Identify patent lending strategies
- Analyze patent sales and pooling
- Discuss risks relevant to investing in patents

Chapter 12
Real Estate Assets and Debt

Keywords

amortization
balloon payment
collateralized mortgage obligations (CMOs)
commercial mortgage loans
commercial mortgage-backed securities
commercial real estate properties
conditional prepayment rate
core real estate
covenants
cross-collateral provision
debt service coverage ratio
equity REITs
fixed charges ratio
fixed-rate mortgage
fully amortized
idiosyncratic prepayment factors
index rate
interest coverage ratio
interest rate cap
loan-to-value ratio (LTV ratio)
lumpiness
margin rate
mortgage
mortgage REITs
mortgage-backed securities (MBS)
negative amortization
opportunistic real estate
option adjustable-rate mortgage (option ARM)
pass-through MBS
prepayment option
primary real estate market
prime mortgages
private real estate
private real estate equity
private real estate market
PSA benchmark
public real estate investment
real estate investment trust (REIT)
real estate style boxes
recourse
refinancing burnout
residential mortgage loans
residential mortgage-backed securities
Residential real estate
seven challenges to international real estate investing
styles of real estate investing
subprime mortgages
unscheduled principal payments
value-added real estate
variable-rate mortgage

Learning Objectives

12.1 Demonstrate knowledge of categories of real estate.

For example:

- Discuss equity versus debt
- Understand the challenges of international real estate investments
- Contrast residential and commercial real estate
- Contrast private and public real estate
- Discuss real estate categorization based on market size

12.2 Demonstrate knowledge of advantages, disadvantages, and styles of real estate investments.

For example:

- Discuss five potential advantages of investing in real estate
- Discuss three potential disadvantages of investing in real estate
- Describe styles of real estate investing
- Understand the core real estate style of investment
- Understand the value-added real estate style of investment
- Understand the opportunistic real estate style of investment
- Describe the attributes of differentiating real estate styles
- Discuss the purposes of real estate style analysis

12.3 Demonstrate knowledge of real estate style boxes.

For example:

- Identify the categorizations of real estate style boxes

12.4 Demonstrate knowledge of residential mortgages.

For example:

- Discuss and calculate payments of fixed-rate mortgages
- Discuss and calculate payments of interest-only mortgages
- Discuss and calculate payments of variable-rate mortgages
- Identify and discuss other variations of mortgages, and apply balloon payments to mortgage valuation
- Explain default risk in residential mortgages

12.5 Demonstrate knowledge of commercial mortgages in the context of alternative investments.

For example:

- Describe characteristics of commercial mortgages
- Describe the analysis of default risk of commercial mortgages
- Identify and describe financial ratios employed in the analysis of commercial mortgage default

12.6 Demonstrate knowledge of mortgage-backed securities.

For example:

- Describe types of mortgage-backed securities
- Discuss prepayment options within residential mortgages
- Discuss and apply methods of measuring unscheduled prepayment rates such as conditional prepayment rates (CPRs) and the resulting Public Securities Association (PSA) benchmark
- Describe prepayment factors not associated with changing interest rates
- Describe commercial mortgage-backed securities as compared with residential mortgage-backed securities

12.7 Demonstrate knowledge of liquid alternatives: real estate investment trusts (REITs).

For example:

- Define types of real estate investment trusts (REITs)
- List advantages and disadvantages of REITs as an investment

12.8 Demonstrate knowledge of observations regarding historical returns of mortgage REITs

For example:

- Summarize the key observations on historical mortgage REIT returns that are consistent with economic reasoning

Chapter 13
Real Estate Equity

Keywords

after-tax discounting approach
backward induction
calculation of the returns to the NPI
closed-end real estate mutual fund
commingled real state funds
comparable sale prices approach
cost approach
decision node
decision tree
depreciation
discounted cash flow (DCF) method
effective gross income
equity residual approach
exchange-traded funds (ETFs)
fixed expenses
FTSE NAREIT US Real Estate Index Series
gearing
income approach
information node
NCREIF Property Index (NPI)
net lease
net operating income (NOI)
net sale proceeds (NSP)
open-end real estate mutual funds
operating expenses
potential gross income
pre-tax discounting approach
private equity real estate funds
profit approach
real estate appraisal
real estate development projects
real estate joint ventures
real estate valuation
real option
risk premium approach
stale appraisal effect
stale pricing
syndications
transaction-based real estate valuation methods
vacancy loss rate
variable expenses

Learning Objectives

13.1 Demonstrate knowledge of real estate development in the context of alternative investments.

For example:

- Understand the development phase of real estate
- Describe real estate development as a string of real options
- Understand how an abandonment option can be factored into a real estate development project
- Describe how real assets can be modeled using decision trees
- Apply a decision tree and backward induction to value a real estate development project

13.2 Demonstrate knowledge of commercial real estate valuation.

For example:

- Discuss the importance of commercial real estate equity exposures
- Understand the comparable sale prices approach to valuation
- Identify and discuss the profit and cost approaches to real estate valuation
- Calculate cap rates and apply the perpetuity valuation approach to a real estate project
- Discuss the income approach as a major real estate valuation approach
- Discuss transaction-based methods to real estate valuation
- Identify two advantages of appraisal-based models over transaction-based models
- Identify four disadvantages of appraisal-based models over transaction-based models
- Describe the NCREIF property index as an appraisal-based index

13.3 Demonstrate knowledge of valuation and risks of real estate equity.

For example:

- Apply the discounted cash flow approach (i.e., income approach) to the calculation of net operating income
- Calculate a real estate project's discount rate using the risk premium approach, and use that rate to value the project
- Understand the role of taxes in estimating both the discount rate and the cash flows of a real estate project

13.4 Demonstrate knowledge of the income method of real estate valuation.

For example:

- Calculate the appraised value of an office building using the income approach

13.5 Demonstrate knowledge of alternative real estate investment vehicles.

For example:

- Identify and describe private equity real estate funds
- Identify and describe commingled real estate funds
- Identify and describe syndications
- Identify and describe joint ventures
- Describe limited partnerships, and apply the concepts of gearing and loan-to-value (LTV) ratios
- Identify and describe open-end real estate mutual funds
- Discuss options and futures on real estate indices
- Identify and describe exchange-traded funds based on real estate indices
- Identify and describe closed-end real estate mutual funds
- Discuss equity real estate investment trusts

13.6 Demonstrate knowledge of equity REIT returns.

For example:

- Contrast private and public REITs
- Discuss possible illiquidity premiums in public REITs
- Define the FTSE NAREIT US Real Estate Index Series

13.7 Demonstrate knowledge of historical risks and returns of equity real estate investment trusts (REITs).

For example:

- Summarize the key observations on historical equity REIT returns that are consistent with economic reasoning

Topic 4: Hedge Funds

Readings

Alternative Investments: CAIA Level I, Fourth Edition, Wiley, 2020. Part Three: Hedge Funds, Chapters 14 – 19.

Chapter 14
Structure of the Hedge Fund Industry

Keywords

absolute return strategies
annuity view of hedge fund fees
asymmetric incentive fees
at-the-money incentive fee approximation
classification of hedge fund strategies
closet indexer
consolidation
convergent strategies
diversified strategies
equity strategies
event-driven strategies
excessive conservatism
fee bias
fund mortality
fund of funds
headline risk
hedge fund program
high-water mark
incentive fee option value
instant history bias or backfill bias
investability
liquidation bias
lock-in effect
managerial coinvesting
managing returns
massaging returns
multistrategy fund
off-balance-sheet risk
opportunistic
optimal contracting
option view of incentive fees
participation bias
perverse incentive
pure asset gatherer
relative return product
relative value strategies
representativeness
safe harbor
short volatility exposure
single-manager hedge fund
strategy definitions
style drift
synthetic hedge funds

Learning Objectives

14.1 Demonstrate knowledge of the distinguishing features of hedge funds and their growth and concentration over time.

For example:

- Identify and describe the three primary elements of hedge funds
- Recognize the six investment flexibilities offered by hedge funds
- Discuss the reasons for hedge fund industry growth and concentration

14.2 Demonstrate knowledge of hedge fund fees.

For example:

- Recognize typical hedge fund fee arrangements
- Calculate annual hedge fund fees

- Describe and apply hedge fund fees under different high-water marks (HWMs) and hurdle rates
- Discuss the potential effects of incentive fees on hedge fund manager behavior
- Recognize and apply the annuity view of hedge fund fees
- Recognize and apply the option view of incentive fees and its implications on manager behavior
- Describe the empirical evidence regarding hedge fund fees and managerial behavior

14.3 Demonstrate knowledge of various types of hedge funds.

For example:

- List hedge fund strategies
- Contrast single-manager hedge funds, funds of funds, and multistrategy funds

14.4 Demonstrate knowledge of hedge fund returns and asset allocation.

For example:

- Discuss the process of analyzing a hedge fund program
- Identify strategies grouped by systemic risk
- Discuss equity strategies in hedge funds
- Discuss event-driven and relative value strategies in hedge funds
- Discuss event risk and volatility strategies in hedge funds
- Discuss event risk and insurance-type strategies in hedge funds
- Discuss absolute return strategies in hedge funds
- Discuss diversified fund strategies in hedge funds

14.5 Demonstrate knowledge of the process of evaluating a hedge fund investment program.

For example:

- Identify the program parameters of hedge fund investments
- Discuss various research findings regarding hedge fund performance
- Explain the approach and benchmarks of opportunistic hedge fund investing

14.6 Demonstrate knowledge of research studies on whether hedge funds adversely affect the financial markets.

For example:

- Discuss the evidence regarding the market impact of hedge funds during the Asian currency crisis of 1997
- Discuss the evidence regarding the market impact of quantitative hedge funds during the crisis of 2007

14.7 Demonstrate knowledge of hedge fund indices.

For example:

- Describe hedge fund indices
- Understand the structure of management and incentive fees on individual hedge funds as well as on hedge fund indices
- Understand managed futures hedge funds
- Contrast asset weighted hedge fund indices and equally weighted hedge fund indices
- Recognize the size of the hedge fund universe
- Understand representativeness and data biases in hedge funds
- Understand and apply strategy definition and style drift
- Discuss index investability of hedge funds

Chapter 15
Macro and Managed Futures Funds

Keywords

alpha decay
black-box model trading
breakout strategies
capacity
capacity risk
capital at risk
Commodity Futures Trading Commission (CFTC)
commodity pool operator (CPO)
commodity pools
commodity trading advisers (CTAs)
counterparty risk
countertrend strategies
degradation
discretionary fund trading
equal dollar risk allocation
equal risk contribution
event risk
exponential moving average
fundamental analysis
futures contract dollar risk
futurization
global macro funds
in-sample data
lack of trends risk
leverage
liquidity risk
managed account
managed futures
market capacity weighting
market microstructure
market risk
mean-reverting
model risk
momentum
Mount Lucas Management (MLM) Index
moving average
multistrategy CTAs
National Futures Association (NFA)
natural hedger
out-of-sample data
pattern recognition system
point value
private commodity pools
public commodity pools
random walk
relative strength index (RSI)
robustness
sideways market
simple moving average
slippage
systematic fund trading
systematic trading strategies
technical analysis
thematic investing
transparency
transparency risk
trend-following strategies
validation
volatility targeting
weighted moving average
whipsawing

Learning Objectives

15.1 Demonstrate knowledge of macro and managed futures strategies.
For example:
- Contrast discretionary and systemic trading
- Contrast and discuss fundamental and technical analysis

15.2 Demonstrate knowledge of global macro.

For example:

- Define global macro trading strategies
- Understand global macro strategies based on foreign exchange
- Understand global macro strategies based on sovereign bonds
- Understand global macro strategies based on economic policy
- Understand global macro strategies based on thematic investing
- Understand global macro strategies based on both micro and macro economic changes
- Identify primary risks of macro investing

15.3 Demonstrate knowledge of managed futures.

For example:

- Describe futures contracts
- Understand the structure of the managed futures industry
- Define the purpose of the managed futures industry
- Explain the organization and regulation of the managed futures industry
- Discuss three ways to access managed futures

15.4 Demonstrate knowledge of systematic trading.

For example:

- Understand systematic trading rules
- Identify three key questions in evaluating a systematic trading system
- Understand validation and the potential degradation of systematic trading rules
- Explain various systematic trading strategies
- Calculate simple moving averages in systematic trading strategies
- Calculate weighted and exponential moving averages in systematic trading strategies
- Interpret moving average strategies
- Discuss breakout strategies
- Analyze trend-following strategies as being long volatility
- Analyze non-trend-following strategies as pattern recognition systems
- Discuss relative value strategies and technical analysis

15.5 Demonstrate knowledge of the core dimensions of managed futures investment strategies.

For example:

- Discuss fundamental and technical data sources as core managed futures strategies
- Discuss systematic and discretionary implementation styles as core managed futures strategies
- Discuss a strategy focus as core managed futures strategies
- Discuss time horizon as core managed futures strategies

15.6 Demonstrate knowledge of systemic futures portfolio construction.

For example:

- Identify the four core decisions of a futures trading system
- Discuss data processing in futures portfolio construction
- Understand position sizing and calculate the number of futures contracts to hold to meet portfolio objectives
- Explain market allocation in futures portfolio construction
- Discuss trading execution in futures portfolio construction

15.7 Demonstrate knowledge of various core benefits of managed futures for investors.

For example:

- Identify and discuss the eight benefits of managed futures for investors

15.8 Demonstrate knowledge of evidence on managed futures returns.

For example:

- Discuss evidence on alpha generation from managed futures stratgies
- Discuss evidence on downside risk protection offered from managed futures strategies
- Explain mechanical managed futures indices
- Discuss why managed futures may provide superior returns
- Discuss six potential risks of managed futures funds
- Understand managed accounts and the platforms of managed futures funds used to create a diversified portfolio of CTAs
- Discuss the structure of multi-manager funds
- Discuss the structure of managed futures products with managed accounts
- Explain the structure of managed futures products with platforms

15.9 Demonstrate knowledge of benefits of managed futures funds.

For example:

- Discuss research examining the benefits of managed futures funds
- Identify sources of return for managed futures funds
- Summarize the key observations on historical macro and systematic diversified fund returns that are consistent with economic reasoning

Chapter 16
Event-Driven Hedge Funds

Keywords

activist investment strategy
agency costs
agency theory
agent compensation scheme
antitrust review
bankruptcy process
bidding contest
capital structure arbitrage
cash-for-stock mergers
corporate event risk
corporate governance
distressed debt hedge funds
event-driven
event-driven multistrategy funds
financial market segmentation
financing risk
Form 13D
Form 13F
Form 13G
free rider
interlocking boards
liquidation process
long binary call option
long binary put option
merger arbitrage
one-off transaction
principal-agent relationship
proxy battle
recovery value
reorganization process
selling insurance
shareholder activism
special situation funds
spin-off
split-off
staggered board seats
stock-for-stock mergers
toehold
traditional merger arbitrage
wolf pack

Learning Objectives

16.1 Demonstrate knowledge of the sources of most event strategy returns.

For example:

- Define corporate event risk
- Understand event strategies as selling insurance
- Discuss event strategy returns through the lends of binary options
- Understand event strategies as binary call options

16.2 Demonstrate knowledge of activist investing.

For example:

- Understand the relationship between corporate governance and activist investing
- Define proxy battle
- Identify and explain the five dimensions of shareholder activists
- Identify strategies of shareholder activists
- Explain agency theory and why managers are not viewed as maximizing shareholder wealth
- Discuss consequences of misalignment between shareholders and managers
- Understand corporate governance battles
- Discuss the activist agenda including CEOs, compensation, and boards of directors
- Discuss the activist agenda including capital structure and dividend policy issues
- Discuss the activist agenda including mergers and divestitures
- Summarize the key observations on historical activist fund returns that are consistent with economic reasoning

16.3 Demonstrate knowledge of merger arbitrage.

For example:

- Identify the different types of corporate mergers
- Discuss apply a stock-for-stock merger arbitrage deal
- Discuss third-party bidders and bidding wars
- Understand the risks of merger arbitrage
- Identify regulatory risk within the context of mergers
- Identify financing risk within the context of mergers
- Summarize the key observations on merger arbitrage fund returns that are consistent with economic reasoning

16.4 Demonstrate knowledge of distressed securities hedge funds.

For example:

- Define distressed debt hedge funds
- Explain the bankruptcy process
- Discuss short sales of equity as writing naked call options
- Discuss the process of searching for distressed undervalued securities
- Explain the process for estimating returns from undervalued securities
- Understand activist investors in distressed securities
- Explain capital structure arbitrage
- Discuss the process of buying a firm using distressed securities
- Summarize the key observations on distressed returns that are consistent with economic reasoning

16.5 Demonstrate knowledge of event-driven multistrategy funds.

For example:

- Define event-driven multistrategy funds
- Summarize the key observations on event-driven multi-strategy fund returns that are consistent with economic reasoning

Chapter 17
Relative Value Hedge Funds

Keywords

anticipated volatility
asset-backed securities
busted convertibles
carry trades
classic convertible bond arbitrage trade
classic dispersion trade
classic relative value strategy trade
complexity premium
components of convertible arbitrage returns
convergence
convertible bonds
correlation risk
correlations go to one
delta
delta-neutral
dilution
duration
duration-neutral
dynamic delta hedging
effective duration
equity-like convertible
fixed-income arbitrage
gamma
hybrid convertibles
implied volatility
intercurve arbitrage positions
intracurve arbitrage positions
marking-to-market
marking-to-model
modified duration
moneyness
mortgage-backed securities arbitrage
net delta
option-adjusted spread
parallel shift
portfolio insurance
price transparency
pricing risk
realized volatility
riding the yield curve
rolling down
short correlation
sovereign debt
tail risk
theta
variance notional value
variance swaps
vega
vega notional value
vega risk
volatility arbitrage
volatility risk
volatility swap
yield curve

Learning Objectives

17.1 Demonstrate knowledge of relative value strategies.
For example:
- Recognize the relative value strategy, and describe the classic relative value strategy trade

17.2 Demonstrate knowledge of convertible bond arbitrage.

For example:

- Define and describe the classic convertible bond arbitrage trade
- Define convertible bonds, and apply the unbundling approach for pricing convertible bonds
- Define busted, hybrid, and equity-like convertibles
- Define, describe, and apply the concept of delta, gamma and theta and how they relate to the convertible arbitrage position
- Explain and determine the effects of gamma and volatility on the profitability of a delta-neutral position
- Discuss short selling in the context of convertible arbitrage
- Recognize the role of a complexity premium to convertible bond arbitrage
- Identify the four reasons that issuers may continue to offer convertible bonds at attractive prices
- Understand the specifics of delta hedging, including the potential profit on a delta-hedged position
- Recognize and discuss return drivers and risks of convertible bond arbitrage
- Summarize the key observations on historical convertible arbitrage returns that are consistent with economic reasoning

17.3 Demonstrate knowledge of volatility arbitrage.

For example:

- Understand the volatility arbitrage strategies
- Describe the terms volatility and vega
- Explain instruments used by volatility arbitrage funds
- Calculate the payoffs to variance swaps
- Discuss risks contained in over-the-counter traded instruments relative to exchange-traded derivatives
- Discuss volatility arbitrage strategies
- Understand market-neutral volatility funds
- Understand and apply the challenges of estimating dispersion
- Explain tail risk strategies
- Understand the dispersion trade
- Explain profit and loss on dispersion trades
- Summarize the key observations on relative value volatility funds returns that are consistent with economic reasoning

17.4 Demonstrate knowledge of fixed-income arbitrage.

For example:

- Understand the core of fixed-income arbitrage strategies
- Recognize types and characteristics of fixed-income arbitrage strategies, and apply the concept of modified duration to bond returns and volatility
- Recognize the characteristics of asset-backed and mortgage-backed securities strategies
- Discuss and determine the effects of prepayment risk and option-adjusted spreads on asset-backed and mortgage-backed securities strategies
- Analyze the five risks of asset-backed and mortgage-backed securities arbitrage
- Summarize the key observations on fixed-income arbitrage returns that are consistent with economic reasoning

17.5 Demonstrate knowledge of relative value multistrategy funds.

For example:

- Discuss the rationale of relative value multistrategy funds
- Summarize the key observations on multistrategy fund returns that are consistent with economic reasoning

Chapter 18
Equity Hedge Funds

Keywords

accounting accrual
asynchronous trading
earnings momentum
earnings surprise
equity long/short funds
equity market-neutral funds
illegal insider trading
informationally efficient
issuance of new stock
legal insider trading
limits to arbitrage
liquidity
market anomalies
market impact
market maker
mean neutrality
multiple-factor scoring models
net stock issuance
overreacting
pairs trading
post-earnings-announcement drift
price momentum
providing liquidity
share buyback program
short interest
short-bias funds
speculation
standardized unexpected earnings
taking liquidity
test of joint hypotheses
underreacting
uptick rule
variance neutrality

Learning Objectives

18.1 Demonstrate knowledge of commonalities between equity hedge funds.
For example:
- Discuss commonalities of equity hedge funds

18.2 Demonstrate knowledge of sources of return for equity hedge funds.
For example:
- Discuss providing liquidity as a source of return for equity hedge funds
- Discuss providing informational efficiency as a source of return for equity hedge funds
- Discuss the process of using factor analysis to enhance returns for equity hedge funds

18.3 Demonstrate knowledge of market anomalies.
For example:
- Define market anomolies
- Discuss how market efficiency tests are tests of joint hypotheses
- Identify issues involved in predicting persistence of market anomalies
- Describe and apply accounting accruals as potential predictors of ex ante alpha
- Define price momentum, and recognize its potential role in generating ex ante alpha
- Define earnings momentum, and recognize its potential role in generating ex ante alpha
- Define net stock issuance, and recognize its potential role in generating ex ante alpha
- Define insider trading, and recognize its potential role in generating ex ante alpha

18.4 Demonstrate knowledge of implementing anomaly strategies.

For example:

- Understand the process of integrating anomalies using factor models
- Understand the process of integrating anomalies using pairs trading
- Contrast short selling and reducing risk with and increasing alpha
- Discuss the limits to arbitrage

18.5 Demonstrate knowledge of various (three) equity strategies.

For example:

- Define the mechanics of short selling
- Understand the basics of short-bias funds
- Summarize the key observations on historical short bias fund returns that are consistent with economic reasoning
- Understand the basics of equity long/short funds
- Summarize the key observations on historical equity long/short fund returns that are consistent with economic reasoning
- Discuss the basics of equity market-neutral funds
- Summarize the key observations on historical equity market neutral fund returns that are consistent with economic reasoning
- Understand equity hedge fund risks

Chapter 19
Funds of Hedge Funds

Keywords

access
conservative funds of funds
diversified funds of funds
fee netting
liquidity facility
market-defensive funds of funds
nontraditional bond funds
operational due diligence
seeding funds
strategic funds of funds
unconstrained bond funds

Learning Objectives

19.1 Demonstrate knowledge of the benefits and costs of diversification in hedge fund investing.

For example:

- Define funds of hedge funds
- Understand the benefits and costs of diversification
- Describe the four functions of fund of funds management
- List the benefits to investing in funds of hedge funds
- List the disadvantages to investing in funds of hedge funds
- Evaluate how fund of fund managers add value
- Discuss and determine the relationship between the number of funds in a portfolio and the level of diversification
- Describe the process for identifying funds for an institutional portfolio or a fund of funds

19.2 Demonstrate knowledge of investing in multistrategy funds.

For example:

- Evaluate and determine fee-related advantages of multistrategy funds
- Evaluate flexibility and transparency in the context of multistrategy funds
- Evaluate potential advantages related to manager selection and operational risk management by funds of funds

19.3 Demonstrate knowledge of the process of investing in funds of hedge funds.

For example:

- Identify advantages that funds of funds have over direct hedge fund investments
- Understand funds of hedge funds as diversified pools
- Discuss empirical evidence regarding fund of funds returns and the potential for reduced biases in reported performance
- Recognize the varying investment objectives of funds of hedge funds
- Describe how funds of funds can act as venture capitalists

19.4 Demonstrate knowledge of building a portfolio of single hedge funds.

For example:

- Contrast the fees associated with a fund of funds with those of a portfolio of single hedge funds
- Discuss costs associated with hedge fund due diligence and minimum investment sizes

19.5 Demonstrate knowledge of multialternatives and other hedge fund liquid alternatives.

For example:

- Contrast liquid alternatives with more typical private placements
- Understand the UCITS framework for liquid alternative
- Discuss investments restrictions on '40 Act funds
- Describe the availability of liquid alternative strategies
- Understand multialternatives as liquid alternatives
- Summarize the key observations on fund of funds returns that are consistent with economic reasoning

19.6 Demonstrate knowledge of observations regarding historical returns of funds of funds

For example:

- Summarize the key observations on fund of funds returns that are consistent with economic reasoning

Topic 5: Private Equity

Readings

Alternative Investments: CAIA Level I, Fourth Edition, Wiley, 2020. Part Four: Private Equity, Chapters 20 – 22.

Chapter 20
Private Equity Assets

Keywords

20-bagger
alpha testing
angel investing
beta testing
buy-and-build strategy
buy-in management buyout
buyout
buyout of a private company
buyouts
buyout-to-buyout deal
cash burn rate
change in the prudent person standard
compound option
conglomerates
convertible preferred stock
EBITDA
EBITDA multiples
efficiency buyouts
enterprise value
entrepreneurship stimulators
equity kicker
evolution of the buyout market
exit plan
first stage, start-up stage, and early stage venture capital
forced sale remedy
Four principal considerations in redemption rights
golden parachute
growth equity default remedies
growth equity redemption sources
growth equity redemption value
growth equity securities
investment structures
leveraged buyout (LBO)
management buy-in (MBI)
management buyout (MBO)
merchant banking
mezzanine venture capital
milestone
protective provisions in growth equity
prudent person standard
redemptive rights
replacement capital
rescue capital
second or late-stage venture capital
secondary buyout
seed capital stage
segmentation
springing board remedy
three common redemption triggers
times revenue method
turnaround strategy
two keys to successful VC investing
unicorn
VC exits
venture capital (VC)
venture capital business plan
venture capital securities
winner-take-all market

Learning Objectives

20.1 Demonstrate knowledge of the terms and background of private equity.

For example:

- Discuss private equity as an asset class and private equity securities
- Understand mezzanine debt
- Understand distressed debt
- Understand leveraged loans

20.2 Demonstrate knowledge of pre-IPO private equity investing.

For example:

- Describe early-stage venture capital opportunities
- Describe growth equity opportunities as later-stage financing
- Describe buyouts
- Contrast venture capital, growth equity, and buyouts

20.3 Demonstrate knowledge of venture capital.

For example:

- Define venture capital opportunities and venture capitalists
- Identify securities and goals used in venture capital
- Discuss the option-like payout of venture capital
- Discuss the history of venture capital
- Explain angel investing and other early stages of venture capital
- Explain first stage, start-up, and other early stage venture capital
- Explain second and later stages of venture capital
- Interpret the j-curve for private equity projects
- Discuss and apply the valuation of VC companies based on operating income
- Discuss venture capital business plans

20.4 Demonstrate knowledge of venture capital as a compound option.

For example:

- Discuss the role of venture capital as a compound option

20.5 Demonstrate knowledge of growth equity.

For example:

- Define growth equity investments and describe growth equity investments
- Discuss protective provisions as a key deal characteristic in growth equity investment
- Discuss redemption rights as a key deal characteristic in growth equity investment
- Explain and calculate the valuation of growth equity based on revenue

20.6 Demonstrate knowledge of buyouts and leveraged buyouts.

For example:

- Define buyout and identify their different types
- Discuss leveraged buyouts
- Identify types of private equity buyouts and resulting new management team
- Identify rescue capital and replacement capital as private equity strategies

20.7 Demonstrate knowledge of buyouts of private companies.

For example:

- Understand buyout objectives
- Discuss capital structure optimization in buyouts
- Discuss operational efficiency in buyouts

20.8 Demonstrate knowledge of leveraged buyouts (LBOs).

For example:

- Discuss the history of leveraged buyouts
- Discuss three key economic and agency issues of buyouts
- Identify five general categories of LBOs that can create value
- Discuss the benefits and appeal of a leveraged buyout to targets
- Calculate projected valuations of an LBO
- Identify LBO exit strategies
- Identify benefits of strong corporate governance principles to the public market

20.9 Demonstrate knowledge of merchant banking.

For example:

- Discuss merchant banking practices

20.10 Demonstrate knowledge of the dynamics of private equity opportunities.

For example:

- Identify implications of winter-take-all markets
- Identify implications of longer time horizons to exits
- Identify three potential reasons for the declining number of public firms in the US
- Discuss competition between private and public ownership structures

Chapter 21
Private Equity Funds

Keywords

auction process
bad-leaver clause
blind pool
business development companies (BDCs)
capital calls
cash flow J-curve
clawback escrow agreement
club deal
co-investment
commitment risk
committed capital
death spiral
dry powder
good-leaver clause
hurt money
in-kind distributions
key personnel clause
NAV J-Curve
private equity funds
private investments in public equity (PIPE)
publicly traded PE firms
reinvestment provision
sourcing investments
structured PIPEs
subscription lines
toxic PIPE
traditional PIPEs
undrawn commitment
VC fund
vintage year

Learning Objectives

21.1 Demonstrate knowledge of private equity (PE) funds.
For example:
- Define PE funds
- Discuss the organization structure of PE funds
- Define PE firms
- Discuss PE portfolio companies
- Understand PE investment by institutional investors

21.2 Demonstrate knowledge of PE funds as intermediaries.
For example:
- Discuss PE fund intermediation and risk
- Discuss PE fund intermediation around efficient inefficiencies
- Identify the five primary functions of PE funds
- Describe forms of PE fund intermediation
- Discuss the life cycle and stages of development of a VC fund
- Interpret the fund J-curve
- Understand undrawn capital commitments
- Identify the four substantial risks of PE

21.3 Demonstrate knowledge of the limited partner (LP) and general partner (GP) relationship life cycle in private equity.
For example:
- Understand the relationship between LPs and GPs in PE
- Discuss the three phases in LP and GP relationships

21.4 Demonstrate knowledge of PE fund fees and terms.

For example:

- Discuss and calculate PE management fees and carried interest
- Understand clawback provisions in PE
- Calculate carried interest and hurdle rates as part of a PE deal
- Explain perverse incentives that can originate from PE hurdle rates
- Explain the GP's contribution to initial PE fund investment
- Explain the key-person provision as part of the LP partnership clause
- Explain termination and divorce of VC funds
- Identify other covenants in VC funds

21.5 Demonstrate knowledge of key determinations of VC fund risks and returns.

For example:

- Discuss access to VC funds as a key to enhanced returns
- Understand diversification as a key to PE risk reduction
- Discuss risk premiums as providing compensation for three main VC risks

21.6 Demonstrate knowledge of three key distinctions of VC and buyout managers.

For example:

- Explain roles and distinctions of buyout managers in VC

21.7 Demonstrate knowledge of leveraged buyout (LBO) funds.

For example:

- Recognize LBO fund structures
- Interpret total number, size, and implications of buyout fund fees
- Discuss agency relationships and their role in LBO firms
- Understand LBO auction markets
- Understand benefits and concerns of club deals in LBOs
- Discuss three factors driving buyout risks relative to VC risks

21.8 Demonstrate knowledge of liquid alternatives in the private equity sector.

For example:

- Describe business development companies (BDCs)
- Calculate the premium (or discount) of closed-end fund prices
- Recognize the effect of illiquidity on closed-end fund pricing
- Discuss the diversification and return-enhancement potential of liquid private equity pools
- Discuss other liquid investments in private equity

21.9 Demonstrate knowledge of funds-of-funds in the private equity sector.

For example:

- Understand fees charged by PE funds of funds
- Discuss the value of information and control in PE funds of funds
- Understand diversification and intermediation of PE funds of funds
- Explain access, selection skills, and expertise for PE funds of funds

21.10 Demonstrate knowledge of private investments in public equity (PIPEs).

For example:

- Identify characteristics and types of securities issues through PIPEs
- Understand motivations of buyers and sellers in PIPEs
- Contrast traditional and structured PIPEs
- Explain toxic PIPEs

21.11 Demonstrate knowledge of secondary markets and structures within the private equity sector.

For example:

- Discuss the secondary market for PE limited partnership interests
- Discuss fee differences between PE and hedge funds
- Understand governance issues within publicly traded PE firms
- Contrast PE governance structures

Chapter 22
Private Credit and Distressed Debt

Keywords

absolute priority rule
acceleration
affirmative covenants
blanket subordination
blocking position
bridge financing
Chapter 11 bankruptcy
Chapter 7 bankruptcy
covenant-lite loans
cramdown
credit spread
debtor-in-possession financing
default rate
direct lending
drawdown fund
fulcrum security
haircut
incurrence covenants
indenture
intercreditor agreement
interval funds
leveraged loans
loan loss rate
loan-to-own investment
maintenance covenants
negative covenants
peer-to-peer lending
PIK toggle
plan of reorganization
recovery rate
sponsored lending
springing subordination
stretch financing
syndicated
takeout provision
unitranche
vulture investors
warrant
weighted average cost of capital

Learning Objectives

22.1 Demonstrate knowledge of types of fund private credit vehicles.
For example:
- Define private credit and distressed debt
- Define interval funds
- Define drawdown funds
- Discuss funds with a loan-to-own objective
- Discuss fulcrum securities and reorganization

22.2 Demonstrate knowledge of fixed income analysis.
For example:
- Describe the three key differences between bonds and loans
- Discuss implications of floating rates vs. fixed rates on interest rate risk
- Discuss and calculate implications of floating vs. fixed rate duration
- Discuss and calculate implications of compounding conventions on modified duration

22.3 Demonstrate knowledge of credit risk analysis and the bankruptcy process.

For example:

- Understand credit ratings, yields, and financial ratios
- Interpret credit spreads and credit risk
- Discuss credit risk and its relationship to risk of default
- Discuss covenants on debt
- Explain the five ways that covenants can control risk
- Describe capital structure and the priority of payment
- Discuss recovery rates
- Explain distressed debt and how it relates to the bankruptcy process

22.4 Demonstrate knowledge of leveraged loans.

For example:

- Understand the basics of leveraged loans
- Discuss growth in leveraged loans
- Explain liquidity and how it relates to the demand for leveraged loans

22.5 Demonstrate knowledge of direct lending.

For example:

- Discuss the process and implications of direct lending

22.6 Demonstrate knowledge of mezzanine debt.

For example:

- Identify structures of mezzanine debt
- Understand how mezzanine debt can lower the weighted average cost of capital
- Compare mezzanine debt financing to other forms of financing
- Understand basic examples of mezzanine financing
- Discuss major types of investors in mezzanine debt
- Identify characteristics of mezzanine debt

22.7 Demonstrate knowledge of distressed debt.

For example:

- Understand the basics of distressed debt
- Identify the supply of distressed debt capital
- Identify the demand for distressed debt capital
- Calculate expected default losses and credit spreads on distressed debt
- Discuss three broad strategic categories of distressed debt investment
- Identify risks of investing in distressed debt
- Discuss vulture investing

22.8 Demonstrate knowledge of private credit performance and diversification.

For example:

- Discuss diversification and its relationship to private credit performance

Topic 6: Structured Products

Readings

Alternative Investments: CAIA Level I, Fourth edition, Wiley, 2020. Part Five: Structured Products, Chapters 23 – 26.

Chapter 23
Introduction to Structuring

Keywords

structuring
complete market
state of the world
tranche
sequential-pay collateralized mortgage obligation
contraction risk
extension risk
interest-only (IO)
planned amortization class (PAC) tranches
principal-only (PO)
targeted amortization class (TAC) tranches
floating-rate tranches
inverse floater tranche
structural credit risk models
call option view of capital structure
put option view of capital structure
cap
caplet
interest rate floor
floor
floorlet
collateralized debt obligation (CDO)
equity tranche
mezzanine tranche
senior tranche
attachment point
detachment point
lower attachment point
upper attachment point
bull call spread
bull put spread

Learning Objectives

23.1 Demonstrate knowledge of the overview of financial structuring.
For example:
- Describe the most common structuring of assets within the corporate form

23.2 Demonstrate knowledge of the major types of structuring.
For example:
- Understand the key elements of a structured product
- Describe hedging with credit derivatives
- Describe structuring with tranches
- Understand how structured products are created

23.3 Demonstrate knowledge of the primary economic role of structuring
For example:
- Understand the economic role of a structured product
- Describe market completion as an economic role
- Understand the concept of a state of the world within structured products
- Describe how structured products can complete the market

23.4 Demonstrate knowledge of collateralized mortgage obligations.

For example:

- Describe a simplified collateralized mortgage obligation structure
- Describe sequential pay structuring
- Contrast extension risk with contraction risk as it pertains to structuring
- Apply a sequential pay tranche to a collateralized mortgage obligation
- Describe other types of collateralized mortgage obligations through the structuring of their cash flows
- Understand the motivations behind structuring mortgage products
- Understand how prepayment speeds can change the valuation of collateralized mortgage obligations
- Understand how systematic risk can change the valuation of collateralized mortgage obligations
- Describe default risk within commercial collateralized mortgage obligations

23.5 Demonstrate knowledge of the structural model approach to credit risk.

For example:

- Describe Merton's structural model using the option-like nature (both call options and put options) of traditional corporate securities
- Describe the inherent conflict of interest that exists between shareholders and bondholders
- Understand the mechanics of Merton's structural model and apply the model to value the firm's debt as well as put options on the firm's assets
- Calculate the value of risky debt with Black-Scholes option pricing model
- Understand how binomial trees can be used to value structured products

23.6 Demonstrate knowledge of interest rate options.

For example:

- Describe an interest rate cap, and calculate cap payments
- Describe interest rate floors, and calculate floors payments
- Discuss interest rate options and counter-party risk

23.7 Demonstrate knowledge of collateralized debt obligations.

For example:

- Define a collateralized debt obligation
- Describe the simplified collateralized debt obligation structure and calculate the waterfall of cash flows
- Understand default risk within a collateralized debt obligation and calculate the waterfall of cash flows in the presence of default
- Describe how option collars are similar to the mezzanine tranche of a pool
- Describe mezzanine tranches and option spreads

Chapter 24
Credit Risk and Credit Derivatives

Keywords

American credit options
assignment
binary options
calibrate a model
cash settlement
CDS indices
CDS premium
CDS spread
credit default swap (CDS)
credit derivatives
credit protection buyer
credit protection seller
credit risk
credit-linked notes (CLNs)
default risk
derivatives
European credit options
exposure at default
funded credit derivatives
hazard rate
interest rate swap
loss given default
mark-to-market adjustment
multiname instruments
novation
physical settlement
price revelation
probability of default
reduced-form credit models
referenced asset
risk-neutral approach
risk-neutral investor
single-name credit derivatives
standard ISDA agreement
swap rate
swap rate curve
total return swap
unfunded credit derivatives

Learning Objectives

24.1 Demonstrate knowledge of credit risk.
For example:
- Explain the underpinnings of credit risk

24.2 Demonstrate knowledge of reduced form modeling of credit risk.
For example:
- Identify the difference between structural models and reduced-form models
- Define the three factors that determine the expected credit loss of a credit exposure
- Calculate expected credit loss
- Describe two key characteristics of the risk-neutral modeling approach
- Define risk-neutral probability
- Describe and apply the risk-neutral approach to pricing risky debt
- Apply the risk-neutral approach to estimating credit spreads
- Apply the reduced-form model to determine relative prices of securities
- Explain what it means to calibrate a model
- List the advantages and disadvantages of the reduced-form model
- Compare structural and reduced-form credit risk models

24.3 Demonstrate knowledge of credit derivatives markets.
For example:
- List and discuss the three economic roles of credit derivatives
- Recognize the three major methods for grouping credit derivatives
- Describe the four stages of the evolution of credit derivative activity

24.4 Demonstrate knowledge of interest rate swaps.

For example:

- Understand simple interest rate swaps
- Identify payers and receivers of interest rate swaps
- Explain how pensions use interest rate swaps
- Understand the mechanics of interest rate swaps
- Describe the initial valuation of an interest rate swap and calculate the expected payments of the swap
- Understand how an existing swap is valued
- Discuss risks in interest rate swaps
- Discuss the global financial crisis of 2007-2009 in the context of swap risk

24.5 Demonstrate knowledge of credit default swaps.

For example:

- Compare and contrast credit default swaps and total return swaps
- Discuss the standard ISDA agreement as a template for negotiated credit agreements
- Explain and apply the mechanics of credit default swaps
- Explain the mark-to-market adjustment when valuing credit default swap contracts
- Explain three methods for unwinding credit default swap transactions
- Recognize typical credit default swap market participants and their swap transactions
- Identify and explain five typical motivations for using credit default swaps

24.6 Demonstrate knowledge of credit options and credit-linked notes.

For example:

- Contrast credit default swaps and credit options
- Recognize the terms of credit call and credit put options
- Explain the credit put option on a bond
- Explain call options on credit default swaps
- Describe credit-linked notes

24.7 Demonstrate knowledge of credit default swap indices.

For example:

- Describe credit default swap index products

24.8 Demonstrate knowledge of the five key risks of credit derivatives.

For example:

- Discuss the risks of excessive credit exposure using off-balance-sheet derivatives, pricing risk of over-the-counter derivatives, and liquidity risk of over-the-counter derivatives
- Discuss the counterparty risk of over-the-counter credit default swaps and the basis risk of credit default swaps

Chapter 25
CDO Structuring of Credit Risk

Keywords

amortization period
arbitrage CDOs
balance sheet CDOs
bankruptcy remote
cash flow CDO
cash-funded CDO
collateralized fund obligation (CFO)
copula approach
distressed debt CDO
diversity score
external credit enhancement
financial engineering risk
internal credit enhancement
market value CDO
overcollateralization
ramp-up period
reference portfolio
reserve account
revolving period
risk shifting
single-tranche CDO
sponsor of the trust
subordination
synthetic CDO
tranche width
weighted average rating factor (WARF)
weighted average spread (WAS)

Learning Objectives

25.1 Demonstrate knowledge of collateralized debt obligations (CDOs).
For example:
- Describe credit-related motivations for CDOs
- Describe investor motivations for CDOs
- Describe the general structure and life cycle of a CDO
- Explain the terminology and details of CDOs

25.2 Demonstrate knowledge of balance sheet CDOs and arbitrage CDOs.
For example:
- Describe three goals for issuing balance sheet CDOs and the balance sheet CDO structure
- Discuss the purposes and attributes of arbitrage CDOs

25.3 Demonstrate knowledge of the mechanics of and motivations for arbitrage CDOs.
For example:
- Describe and apply a typical arbitrage CDO structure
- Analyze the cash flows in a typical arbitrage CDO structure
- Understand the waterfall of an arbitrage CDO
- Identify the three direct financial motivations for a manager of an arbitrage CDO

25.4 Demonstrate knowledge of cash-funded CDOs and synthetic CDOs.
For example:
- Compare and contrast cash-funded CDOs and synthetic CDOs
- Explain how a cash-funded CDO can be used to reduce required regulatory capital
- Calculate the amount of freed-up regulatory capital by using a CDO trust to securitize and sell a portfolio of commercial loans
- Describe the characteristics of synthetic CDOs

25.5 Demonstrate knowledge of cash flow and market value CDOs.

For example:

- Describe the characteristics of cash flow CDOs
- Describe the characteristics of market value CDOs

25.6 Demonstrate knowledge of credit risk and enhancement of CDOs.

For example:

- Define and discuss subordination as an internal credit enhancement
- Discuss and apply overcollateralization
- Describe excess spread as an internal credit enhancement
- Discuss reserve accounts as a credit enhancement
- Describe external credit enhancements to CDOs

25.7 Demonstrate knowledge of new developments in CDOs.

For example:

- Describe distressed debt CDOs
- Describe hedge fund CDOs
- Describe single-tranche CDOs

25.8 Demonstrate knowledge of the risks of CDOs.

For example:

- Recognize the risk of the underlying collateral
- Recognize the financial engineering risk
- Discuss the implications of high correlations among the underlying assets
- Define risk shifting, and discuss its implications for CDOs
- Describe other risks inherent in CDOs
- Describe how CDO credit risk can be modeled

Chapter 26
Equity-Linked Structured Products

Keywords

absolute return structured product
active option
analytical
Asian option
barrier option
boundary condition
building blocks approach
capital protection structured products
cash-and-call strategy
dynamic hedging
equity-linked structured products
EUSIPA
EUSIPA Derivative Map
exotic option
Investment products in the EUSIPA Derivative Map
knock-in option
knock-out option
leverage structured products
look-back option
numerical methods for derivative pricing
overconfidence bias
partial differential equation approach (PDE approach)
participation rate
participation structured products
path-dependent option
payoff diagram level
payoff diagram shape
power reverse dual-currency note
principal protected absolute return barrier note
principal-protected structured product
quanto option
simple option
spread option
static hedge
structured product without exotic options
tax deduction
tax deferral
wrapper
yield enhancement structured products

Learning Objectives

26.1 Demonstrate knowledge of structured products and types of wrappers.
For example:
- Describe equity-linked structured products
- Define a wrapper
- Describe the six types of wrappers

26.2 Demonstrate knowledge of potential tax effects of wrappers.
For example:
- Describe the tax effects of wrappers
- Calculate the pre-tax and after-tax return of fully taxed investments
- Calculate the after-tax return of tax-deferred wrappers
- Calculate the after-tax return on a wrapper that offers both tax deduction and tax deferral

26.3 Demonstrate knowledge of structured products with exotic option features.

For example:

- Compare and contrast simple options and exotic options
- Understand how simple call and put options can be combined to provide principal protection
- Define the participation rate
- Illustrate how a cash-and-call strategy is related to put-call parity
- Identify path-dependent options and binary options
- Describe and apply barrier, knock-in, and active options
- Describe the characteristics of in versus out and up versus down barrier options
- Define spread options and look-back options
- Define a quanto option

26.4 Demonstrate knowledge of popular structured products types.

For example:

- Discuss absolute return and principal protected absolute return barrier notes

26.5 Demonstrate knowledge of the EUSIPA classification.

For example:

- Define EUSIPSA and explain its role in the structured products market
- Describe capital protected structured products
- Describe yield enhancement structured products
- Describe participation structured products
- Describe leverage structured products

26.6 Demonstrate knowledge of global structured product cases.

For example:

- Understand the components within a US-based structured products with multiple kinks
- Understand the components within a German-based structured product with leverage
- Understand the components within a Japan-based structured product based on multiple currencies

26.7 Demonstrate knowledge of structured product valuation.

For example:

- Understand how a structured product can be valued using dynamic hedging
- Discuss the advantages of the simulation approach over the PDE approach
- Contrast the PDE approach and the building blocks approach
- Explain the two principles of payoff diagram shapes and levels
- Discuss the evidence on structured product prices

26.8 Demonstrate knowledge of motivations of structured products.

For example:

- Identify investor motivations for including structured products in a portfolio
- Discuss tax-related motivations for investors
- Discuss the motivations of issuers of structured products

Equation Exception List

Candidates should be aware that all equations are important to understand and that an equation sheet will not be provided on the exam. The following is a list of equations that serve as exceptions and will be provided if needed to answer a specific question. For example, a question asking candidates to describe the implication of a large kurtosis can be answered without having access to the kurtosis formula. On the other hand, a question asking candidates to calculate the kurtosis of a return series would require the kurtosis equation.

$$R_{fcoll} = \ln(1 + R) + R_f \tag{3.6}$$

$$R_{pcoll} = [l \times \ln(1 + R)] + R_f \tag{3.7}$$

$$\rho_s = 1 - \frac{\sum d_i^2}{n(n^2 - 1)} \tag{4.18}$$

$$DW = \frac{\sum_{t=2}^{T}(e_t - e_{t-1})^2}{\sum_{t=1}^{T} e_t^2} \tag{4.23}$$

$$JB = (n/6)[S^2 + (K^2/4)] \tag{4.36}$$

$$P_o = P_l N(d) - P_s N(d - v) \tag{6.10}$$

$$\begin{aligned} c &= SN(d_1) - e^{-rT}KN(d_2) \\ d_1 &= [\ln(S/e^{-rT}K)/v] + (v/2) \\ d_2 &= d_1 - v \\ v &= \sigma_s\sqrt{T} \end{aligned} \tag{6.11}$$

$$\begin{aligned} c &= e^{-rT}\,[FN(d_1) - KN(d_2)] \\ d_1 &= [\ln(F/K)/v] + (v/2) \\ d_2 &= d_1 - v \end{aligned} \tag{6.12}$$

$$\text{Option Price} = e^{-r^* T} S^* N(d_1) - e^{-rT} \text{SN}(d_2) \tag{6.13}$$

$$R_{it} - R_f = a_i + \{[b_{i,d} + (D_1 \times b_{i,diff})] \times (R_{mt} - R_f)\} + e_{it} \tag{8.3}$$

$$EMA_t(\lambda) = \lambda P_{t-1} + \lambda(1-\lambda)P_{t-2} + \lambda(1-\lambda)^2 P_{t-3} + \lambda(1-\lambda)^3 P_{t-4} + \cdots \tag{15.3a}$$

$$\text{Variance Swap Payoff} = \frac{\text{Vega Notional Value} \times (\text{Realized Variance} - \text{Strike Variance})}{2 \times \sqrt{\text{Strike Variance}}} \tag{17.8}$$

$$\text{Total Accruals} = \Delta\text{CA} - \Delta\text{CL} - \Delta\text{Cash} + \Delta\text{STDEBT} - \text{D\&A} \tag{18.1}$$

$$\begin{aligned} B(0,1) &= \lambda \times \frac{\text{K} \times \text{RR}}{(1+r)} + (1-\lambda) \times \frac{\text{K}}{(1+r)} \\ &= \frac{\text{K}}{(1+r)}(\text{RR} \times \lambda + [1-\lambda]) \end{aligned} \tag{24.2}$$

Action Words

In each of the above learning objectives, action words are used to direct your study focus. Below is a list of all action words used in this study guide, along with definitions and two examples of usage, in a question example and in a description. Should you not understand what is required for any learning objective, we suggest you refer to the table below for clarification.
NOTE: The question examples in this table are NOT sample questions for the current exam.

Term	Definition	Question Example	Example of Term Use
Analyze	Study the interrelations	George has identified an opportunity for a convertible arbitrage reverse hedge. What risks are associated with this hedge? A. The convertible may remain overvalued, causing the positive cash flow to harm the position's return profile. B. The short convertible may be called in and the position must be delivered, forcing the hedge to be unwound at an inopportune time. C. The implied volatility may decrease, lowering the bond's value. D. The implied volatility may increase, lowering the bond's value.	You have to **analyze** the positions and factors impacting them. Correct Answer: B
Apply	Make use of	Alicia Weeks, CFA, Real Estate Investment Advisor, works in an Asian country where there are no securities laws or regulations. According to CFA Institute Standard I, Fundamental Responsibilities, Alicia: A. must adhere to the standards as defined in a neighboring country that has the strictest laws and regulations. B. need not concern herself with ethics codes and standards. C. must adhere to the CFA Institute's codes and standards. D. must adhere to the standards as defined in a neighboring country that has the least strict laws and regulations.	You have to **apply** the CFA Institute Standard I to find the correct answer. Correct Answer: C

Term	Definition	Question Example	Example of Term Use
Compare	Describe similarities and differences	Which of the following least accurately compares the Sharpe and Treynor ratios? • Both ratios contain excess return in the numerator. • Both ratios express a measure of return per unit of some measure of risk. • The Sharpe ratio is based on total risk, while the Treynor ratio is based on systematic risk. • The Sharpe ratio is the inverse of the Treynor ratio.	You have to **compare** the three approaches based on their most important similarities and their most important differences Correct Answer: D
Compare and Contrast	Examine in order to note similarities or differences	A comparison of monthly payments and loan balances of the constant payment mortgage with the constant amortization mortgage with the same loan terms will show that: A. the initial payment will be the same. B. the payments of the constant payment mortgage are initially greater than those of the constant amortization mortgage, but at some time period the payments of the constant payment mortgage become less. C. the present value of the payment streams of the two loan types are the same. D. the constant payment mortgage loan balance exceeds that of the constant amortization mortgage during the first six months of the loan.	You have to **compare** indices to arrive at the answer. Correct Answer: C

Term	Definition	Question Example	Example of Term Use
Contrast	Expound on the differences	Which of the following best characterizes a difference between Value at Risk (VaR) and Modified Value at Risk? • Modified VaR is expressed as a percent, while VaR is a dollar value. • Modified VaR uses a user defined confidence interval, while VaR uses a 99% interval. • Modified VaR incorporates non-normality, while traditional VaR assumes normality. • Modified VaR is for a single trading period, while traditional VaR is multiple period.	You have to **contrast** the assumptions of the first model to those of the second model so that the differences are clear. Correct Answer: C
Define	State the precise meaning	The interest rate charged by banks with excess reserves at a Federal Reserve Bank to banks needing overnight loans to meet reserve requirements is called the: A. prime rate. B. discount rate. C. federal funds rate. D. call money rate.	You have to **define**, in this case, the federal funds rate. Correct Answer: C
Describe	Convey an idea or characterize	Which of the following words best describes expected return? A. Spread B. Average C. Spread squared D. Average squared	You need to choose the word that best **describes** the concept from a list. Correct Answer: B
Discuss	Examine or consider a subject	Discuss the limitations of private equity data.	You have to present a **discussion** of a set of ideas in a list or paragraph.

Term	Definition	Question Example	Example of Term Use
Distinguish	Separate using differences	Which of the following best distinguishes between the covariance and the correlation coefficient? A. The covariance indicates the extent to which two assets move together or apart. B. The correlation coefficient is the expected product of the deviations of two variables. C. The covariance is the square root of the correlation coefficient. D. The correlation coefficient is scaled and bounded between +1 and -1.	You have to **distinguish** between risk measurement approaches based on their assumptions regarding the distribution of returns. Correct Answer: D
Explain	Illustrate the meaning	1. Explain why return on assets (ROA) rather than return on equity (ROE) might be the preferred measure of performance in the case of hedge funds. or 2. Which of the following best explains risk from the standpoint of investment? A. Investors will lose money. B. Terminal wealth will be less than initial wealth. C. Final wealth will be greater than initial wealth. D. More than one outcome is possible.	1. You have to place a series of thoughts together as an **explanation** of a term or issue. 2. You need to identify the term that best **explains** a term or issue. Correct Answer: D
Identify	Establish the identity	The investments that have historically performed best during periods of recession are: A. commodities. B. treasury bills. C. stocks and bonds. D. gold.	You have to **identify** the term that best meets the criterion of the question. Correct Answer: C

Term	Definition	Question Example	Example of Term Use
Interpret	Explain the meaning	Your certificate of deposit will mature in one week, and you are considering how to invest the proceeds. If you invest in a 30-day CD, the bank will pay you 4%. If you invest in a 2-year CD, the bank will pay you 6% interest. You should choose the: A. 30-day CD, no matter what you expect interest rates to do in the future. B. 2-year CD, no matter what you expect interest rates to do in the future. C. 30-day CD if you expect that interest rates will fall in the future. D. 2-year CD if you expect that interest rates will fall in the future.	You have to **interpret** the features of an investment scenario. Correct Answer: D
List	Create a series of items	List the determinants of real interest rates.	You have to differentiate from a **list** those items that are consistent with the question.
State	Set forth in words or declare	State the main risks faced by distressed securities investors.	You have to present a list or set of sentences that **states** main ideas.
Understand	Perceive and comprehend nature and significance; grasp meaning	Which of the following would increase the net asset value of a mutual fund share, assuming all other things remain unchanged? A. An increase in the number of fund shares outstanding B. An increase in the fund's accounts payable C. A change in the fund's management D. An increase in the value of one of the fund's stocks	You have to use reasoning to illustrate an **understanding** of a specific issue. Correct Answer: D

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