CAIA Level I Curriculum Companion

2025

TOPIC 1 Professional Standards and Ethics

1.1.1 Professional Standards of Practice

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of Standard I: Professionalism.

Including:

- Interpret Standard I with respect to knowledge of the law, independence and objectivity, misrepresentation, and misconduct
- Identify procedures for compliance with respect to knowledge of the law, independence and objectivity, misrepresentation, and misconduct

Demonstrate knowledge of Standard II: Integrity of Capital Markets.

Including:

- Interpret Standard II with respect to material nonpublic information and market manipulation
- Identify procedures for compliance with respect to material nonpublic information

Demonstrate knowledge of Standard III: Duties to Clients.

Including:

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

Demonstrate knowledge of Standard IV: Duties to Employers.

Including:

- Interpret Standard IV with respect to loyalty, additional compensation arrangements, and responsibilities of supervisors
- Identify procedures for compliance with respect to additional compensation arrangements, and responsibilities of supervisors

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

Including:

- Interpret Standard V with respect to diligence and reasonable basis, communication with clients and prospective clients, and record retention
- Identify procedures for compliance with respect to diligence and reasonable basis, communication with clients and prospective clients, and record retention

Demonstrate knowledge of Standard VI: Conflicts of Interest.

Including:

- Interpret Standard VI with respect to disclosure of conflicts, priority of transactions, and referral fees
- Identify procedures for compliance with respect to disclosure of conflicts, priority of transactions, and referral fees

TOPIC 2 Introduction to Alternative Investments

2.1.1 Defining Alternative Investments

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of various alternative investment types.

Including:

- Identify characteristics of institutional-quality investments.
- Describe real assets (i.e., commodities, real estate, intellectual property, and infrastructure)
- Describe hedge funds
- Describe private equity (i.e., venture capital, growth equity, and leveraged buyouts)
- Describe private debt (e.g., direct lending, mezzanine debt, distressed debt, and collateralized debt obligations)

Keywords

alternative Investments	institutional-quality investment	traditional investments
real assets	commodities	real estate
land	timberland	farmland
natural Resources	infrastructure	hedge Fund
private Equity	venture capital	leveraged buyouts (LBOs)
direct lending	distressed debt	structured products

2.1.2 The Blurred Lines Between Traditional and Alternative Investments

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the defining characteristics of alternative investments.

Including:

- Understand that the lines between traditional and alternative investments are not distinct and universal

- Identify which categories of investments are generally qualified as traditional, generally qualified as alternative, and which can be placed under both

2.1.3 A History of Alternative Investing: The U.S. Case

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

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

Keywords

prudent person standard

2.1.4 History of Alternative Investing in Asia

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the history of alternative investment in Asia

Including:

- Understand the diversity, breadth and stages of evolution of markets in Asia

2.1.5 Distinguishing Investments by Risk and Return Characteristics

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

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

Keywords

absolute return products	illiquidity	lumpy assets
inefficiency	efficiency	

2.1.6 Distinguishing Investments by Methods of Analysis

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

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

2.1.7 Additional Characteristics That Distinguish Alternative Investments

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

- 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
- Discuss institutional factors and their implications in trading
- Explain information asymmetries and their issues within financial analysis and portfolio management
- Explain incomplete markets and their challenges
- Understand the influences of innovation on alternative investments

Keywords

moral hazard	structuring	regulatory factors
trading strategies	institutional factors	incomplete markets

information asymmetries		

2.1.8 Essential Goals of Alternative Investing

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the goals of alternative investing.

Including:

- Define active management
- Contrast active management to passive investing
- Understand 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
- Contrast pure arbitrage with arbitrage as an active absolute return strategy
- Distinguish between the goal of return enhancement and return diversification in an investment program

Keywords

active management	**passive investing**	**active return**
active risk	**benchmark**	**benchmark return**
absolute return standard	**relative return standard**	**pure arbitrage**

2.1.9 Two Pillars of Alternative Investment Management

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the two pillars of alternative investment management

Including:

- 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 2×2 framework

2.2.1 The Participants

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the participants in the alternative investing environment.

Including:

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

Keywords

buy side	**plan sponsor**	**endowment**
family office	**foundation**	**private limited partnerships**
sovereign wealth funds	**separately managed accounts**	**'40 Act funds**
master limited partnerships (MLPs)	**mutual funds**	**sell side**
large dealer banks	**proprietary trading**	**Back office operations**
front office operations	**middle office operations**	**prime broker**
fund administrator	**custodians**	**financial platforms**
Depository Trust Company (DTC)	**commercial bank**	**universal banking**
depositories	**investment bank**	**systemic risk**

2.2.2 Alternative Investment Legal Structures

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the legal structures in alternative investing.

Including:

- 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 purpose vehicles, special purpose entities)
- Explain the difference in bankruptcy remote entities (e.g., special purpose vehicles, special purpose entities)
- Identify the structures of various entities (e.g., master-feeder funds, master trusts) that facilitate investor taxation differences

Keywords

special purpose entity (SPE)	special purpose vehicle (SPV)	feeder fund
master trust	master-feeder funds	

2.2.3 Key Features of Fund Structures

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the key features of fund structures.

Including:

- Identify 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
- Explain moral hazard and adverse selection
- Describe corporate governance in private funds
- State 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
- Discuss global regulations (e.g., MiFID, MiFID II, AIFMD)
- Identify global fund structures (e.g., FIFs, SICAV, SICAF, ICAV)

Keywords

private-placement memoranda	management company operating agreement	subscription agreement
adverse selection	qualified majority	limited partnership agreement (LPA)
limited partner advisory committee (LPAC)	partnership agreement	

2.2.4 Drawdown Fund Fees and Terms

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of PE-style fund fees and terms.

Including:

- 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 PE-style funds
- Identify other covenants in PE-style funds

Keywords

clawback escrow agreement	hurt money	key personnel clause
good-leaver clause	bad-leaver clause	

2.2.5 Financial Markets

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the financial markets involved in alternative investments.

Including:

- 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

Keywords

primary market	secondary market	limit orders
securitization	bid-ask spread	market making
market orders	market takers	third markets
fourth markets		

2.2.6 Short Selling

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of short-selling processes and mechanics.

Including:

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

Keywords

short selling	**substitute dividends**	**rebate**
special stock	**dividend irrelevancy**	**bought in**
general collateral stocks	**short squeeze**	

2.3.1 Types of Alternative Investment Funds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the two main fund structures used for alternative investment funds.

Including:

- Identify the primary characteristics of open-end (aka evergreen) fund structures
- Identify the primary characteristics of drawdown (aka PE-style, closed-end) fund structures
- Contrast open-end funds with drawdown funds
- Explain the role of a high-water mark in an open-end fund structure
- Identify the risks unique to PE and PE fund structures
- Identify the strategies to mitigate substantial risk in PE fund structures
- Discuss fee differences between PE and hedge funds

Keywords

gates	**interval funds**	**blind pool equity fund**
committed capital	**capital calls**	

2.3.2 Liquid Alternative Investments

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of liquid alternative investments.

Including:

Define liquid alternative investments

- Define liquid alternative investments
- Understand the spectrum of liquid alternative products
- Identify the distinct types of alternative investments
- Describe the factors driving the growth of liquid alternative investments
- State the regulatory constraints that affect liquid alternative investments

- State the main factors that contribute to the differences between the returns of private placement vehicles and those of alternative investments

Keywords

liquid alternatives	**hedge fund replication**	**closed-end mutual fund**

2.3.3 Trend of LP Preference for Direct Investment

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the trend of LP preference for direct investment and the challenges of co-investing.

Including:

- Explain the different models of direct investment.
- Understand the drivers for direct investment.
- Identify the most common type of direct investment.
- Understand the challenges of co-investing from the LP perspective.
- Understand the challenges of co-investing from the GP perspective.

Keywords

partnership investing	**solo investing**	**co-investment**

2.3.4 Co-Investments

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of co-investment.

Including:

- List the three alternative co-investing structures
- Explain the basics of co-investing.
- Identify the investment processes for co-investing.
- Identify advantages of co-investing.
- Identify expected disadvantages of co-investing.

Keywords

annex fund	**top-up fund**	**bridging**

lock-step provision	**promote**	

2.3.5 Historical Returns of Co-Investment

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of observations regarding historical returns of co-investment.

Including:

- Interpret evidence on the performance track record of co-investment.
- Identify the specific capabilities that investors must develop to be successful in co-investments.
- Describe the impact that co-investing has on the private equity "J-curve."

2.4.1 Return and Rate Mathematics

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of return and rate mathematics.

Including:

- Distinguish simple from compound interest
- Distinguish discrete from continuous compounding

Keywords

continuous compounding	**discrete compounding**	**simple interest**

2.4.2 Internal Rate of Return

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

- Understand which alternative investments are likely to use IRR and why this approach may be more suitable than traditional performance metrics
- Solve for the IRR given a series of cash flows and valuation.

Keywords

internal rate of return (IRR)	interim IRR	since-inception IRR

2.4.3 Problems with Internal Rate of Return

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

- Discuss the effect of complex cash flow patterns on the computation and interpretation of IRRs
- Explain challenges of comparing investments based on IRRs
- Discuss the difficulties of aggregating IRRs
- Explain the relationship between IRR and the reinvestment rate assumption

Keywords

borrowing type cash flow pattern	complex cash flow pattern	aggregation of IRRs
multiple sign change cash flow pattern	reinvestment rate assumption	

2.4.4 Modified Internal Rate of Return

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of modified internal rate of return (IRR).

Including:

- Apply the modified internal rate of return approach
- Identify advantages and disadvantages of modified internal rate of return
- Evaluate time-weighted and dollar-weighted returns

Keywords

time-weighted returns	modified IRR	dollar-weighted returns

2.4.5 Other Performance Measures

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of other performance measures associated with illiquid investments.

Including:

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

Keywords

distribution to paid-in (DPI) ratio	total value to paid-in (TVPI) ratio	residual value to paid-in (RVPI) ratio
Public Market Equivalent (PME) Method		

2.4.6 Illiquidity, Accounting Conservatism, IRR, and the J-Curve

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

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

Keywords

Financial Accounting Standard (FAS) 157	J-Curve

2.4.7 Distribution of Cash Waterfall

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the distribution of cash waterfall.

Including:

- Explain the distribution of cash waterfall provision of a limited partnership agreement
- Understand 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

- Determine fund-as-a-whole carried interest and deal-by-deal carried interest
- Calculate clawback provisions
- Analyze hard and soft hurdle rates and their sequences of distribution
- Discuss the potential effects of incentive fees on decision-making, and their option like nature

Keywords

waterfall	**carried interest**	**catch-up provision**
hurdle rate	**incentive fee**	**performance-based fee**
preferred return	**vesting**	**clawback**
compensation scheme	**catch-up rate**	**management fees**
management fee offsets	**deal-by-deal carried interest**	**hard hurdle rate**
soft hurdle rate	**fund-as-a-whole carried interest**	

2.4.8 Returns Based on Notional Principal

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of returns based on notional principal.

Including:

- 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

Keywords

notional principal	**return on notional principal**	**fully collateralized**
partially collateralized		

2.5.1 Return Distributions

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the characteristics of return distributions.

Including:

- Contrast ex ante and ex post return distributions
- Understand the importance of the normal distribution in statistical analysis

- Describe the characteristics of lognormal distributions

Keywords

ex ante returns	ex post returns	normal distribution
lognormal distribution		

2.5.2 Moments of the Distribution

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of moments of return distributions (i.e., mean, variance, skewness, and kurtosis).

Including:

- Explain the first four 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

Keywords

skewness	kurtosis	excess kurtosis
leptokurtosis	mesokurtosis	platykurtosis

2.5.3 Covariance and Correlation

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of various measures of correlation of returns.

Including:

- Demonstrate 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

Keywords

covariance	correlation coefficient	Spearman rank correlation

perfect linear positive correlation	**perfect linear negative correlation**	

2.5.4 Beta and Autocorrelation

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of Beta and Autocorrelation.

Including:

- Define and calculate beta in the context of the CAPM
- Define and calculate autocorrelation
- Define and calculate higher-order autocorrelation
- Define and apply the Durbin-Watson test

Keywords

autocorrelation	**first-order autocorrelation**

2.5.5 Interpreting Standard Deviation and Variance

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of standard deviation (volatility) and variance.

Including:

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

2.5.6 Testing for Normality

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

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

Keywords

Jarque-Bera test

2.6.1 Informational Market Efficiency

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the concept of informational market efficiency.

Including:

- Define informational market efficiency
- Explain 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

Keywords

informational market efficiency	**semistrong form informational market efficiency**	**strong form informational market efficiency**
weak form informational market efficiency		

2.6.2 The Time Value of Money, Prices, and Rates

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the time value of money, prices, and rates.

Including:

- Understand zero-coupon bonds and its present value function
- Calculate interest rates from zero coupon bond prices
- Determine 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

Keywords

anticipated inflation rate	**term structure of interest rates**	**modified Fisher equation**
real interest rate	**nominal interest rate**	**Fisher effect or Fisher equation**
nominal price	**yield to maturity**	**real price**

2.6.3 Forward Interest Rates

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of forward interest rates.

Including:

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

Keywords

implied forward rate	**term structure of implied forward rates**

2.6.4 Arbitrage-Free Models

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of arbitrage-free financial models.

Including:

- Describe arbitrage-free models
- State a key externality of arbitrage activities
- Discuss applications of arbitrage-free models
- Describe arbitrage-free pricing in spot markets
- Describe hedged and unhedged carry trades

Keywords

arbitrage-free model	**relative pricing model**	**absolute pricing model**
spot market	**cash market**	**arbitrage**

2.6.5 Binomial Tree Models

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of binominal tree models.

Including:

- Understand the mechanics of binomial trees
- Explain the differences between a binomial tree and a recombining binomial tree
- Solve for the value of a call option using a simplified binomial tree and stock prices
- Explain risk-neutral models and when they are appropriate to employ
- State the advantages of binomial tree models

Keywords

binomial tree	**recombining binomial tree**	**risk-neutral model**

2.6.6 Single-Factor Default-Free Bond Models

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of single factor default-free bond models.

Including:

- Define traditional duration
- Interpret duration in the case of a fixed coupon bond
- Determine 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
- Discuss implications of floating vs. fixed rate duration
- Assess implications of compounding conventions on modified duration
- Explain duration as it relates to the longevity of a zero-coupon bond
- Analyze hedging or immunizing a long-short portfolio with duration through time
- Explain extensions to traditional duration

Keywords

duration	**interest rate immunization**	**Modified duration**

2.6.7 Reduced-Form Modeling of Credit Risk

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of reduced form modeling of credit risk.

Including:

- 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
- 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
- Contrast structural and reduced-form credit risk models

Keywords

reduced-form credit models	**exposure at default**	**loss given default**
probability of default	**risk-neutral approach**	**risk-neutral investor**
hazard rate		

2.6.8 Single-Factor Equity Pricing Models

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of single factor equity pricing models.

Including:

- Define an asset pricing model
- 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

Keywords

asset pricing model	**capital asset pricing model (CAPM)**	**ex ante models**
idiosyncratic return	**idiosyncratic risk**	**systematic return**
systematic risk	**ex post model**	**excess return**
equity risk premium	**single-factor asset pricing model**	

2.6.9 Single-Factor Models and Regression

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of single-factor regression models.

Including:

- 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
- Apply the statistical significance of regression parameter estimates

Keywords

dependent variable	**independent variable**	**regression**
simple linear regression	**intercept**	**residuals**
slope coefficient	**goodness of fit**	**r-squared**
t-statistic	**t-test**	

2.6.10 Hypothesis Testing

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of statistical methods for locating alpha.

Including:

- 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
- Understand the four common problems with using inferential statistics
- Discuss type I and type II errors in hypothesis testing
- Understand erroneous conclusions with statistical testing

Keywords

null hypothesis	**alternative hypothesis**	**p-value**
confidence interval	**test statistic**	**significance level**
type I error	**type II error**	

2.6.11 Sampling and Testing Problems

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of sampling and testing problems.

Including:

- Identify 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

Keywords

selection bias	**self-selection bias**	**survivorship bias**
data dredging	**data mining**	**backfill bias**
backfilling	**backtesting**	**overfitting**
cherry-picking		

2.7.1 Forward Contracts Versus Futures Contracts

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of forward and futures contracts.

Including:

- Describe the trading differences between forward and futures contracts
- Apply the marking-to-market process for futures positions
- Discuss the effect of marking-to-market on counterparty risk
- Evaluate the effect of marking-to-market and the time value of money on risk and on prices
- Analyze initial margin for futures positions
- Analyze maintenance margin for futures positions2.7.1 Forward Contracts Versus Futures Contracts

Keywords

open interest	**marked-to-market**	**margin call**
initial margin	**maintenance margin requirement**	**Counterparty risk**

2.7.2 Foundations of Forward Contracts

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of foundations of forward contracts.

Including:

- 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 the relationship between forward prices and expected bond rates

Keywords

forward contract

2.7.3 Forward Contracts on Rates

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the impacts of forward contracts on rates.

Including:

- 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

Keywords

reference rate	forward rate agreement (FRA)	swap

2.7.4 Forward Contracts on Assets with Benefits and Costs of Carry

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

- 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

- 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

Keywords

carrying cost	cost-of-carry model	cost of carry
convenience yield	storage costs	marginal market participant

2.7.5 Managing Long-Term Futures Exposures

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of managing long-term futures exposures.

Including:

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

Keywords

rolling contracts	distant contracts	front month contract

2.7.6 Option Exposures

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of option exposures.

Including:

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

Keywords

naked option	**covered call**	**protective put**
option spread	**option straddle**	**option strangle**
ratio spreads	**option collar**	**risk reversal**
put-call parity	**bull spread**	

2.7.7 Interest Rate Options

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of interest rate options.

Including:

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

Keywords

cap	**caplet**	**interest rate floor**
floor	**floorlet**	

2.7.8 Interest Rate Swaps

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of interest rate swaps.

Including:

- 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

Keywords

interest rate swap	**swap rate**	**swap rate curve**

2.7.9 Option Pricing Models and Option Senitivites

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of option pricing models and option sensitivities.

Including:

- Understand the concept of an option on a portfolio
- Understand the Black-Scholes call-option formula
- Understand the Black forward option pricing model
- Understand the currency option pricing model
- Explain the five most 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

Keywords

Black-Scholes call option formula	**rho**	**omicron**
lambda/omega	**delta**	**vega**
gamma	**theta**	**vega risk**

2.8.1 Measures of Risk

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of measures of risk.

Including:

- Define semivariance, semistandard deviation, downside deviation, semivolatility, and tracking error
- Describe drawdown, shortfall risk, target semivariance, and target semistandard deviation
- Calculate drawdown
- Interpret value at risk (VaR) and conditional value-at-risk (CVaR)

- Discuss the strengths and weaknesses of VaR

Keywords

semivariance	**semistandard deviation**	**semivolatility**
shortfall risk	**target semistandard deviation**	**target semivariance**
tracking error	**drawdown**	**maximum drawdown**
conditional value-at-risk	**value at risk**	**downside deviation**

2.8.2 Estimating Value at Risk (VaR)

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

- 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)

Keywords

parametric VaR	**Monte Carlo analysis**

2.8.3 Benchmarking and Performance Attribution

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of benchmarking and performance attribution.

Including:

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

Keywords

benchmarking	peer group	performance attribution
return attribution		

2.8.4 Ratio-Based Performance Measures

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

- Describe the two major types of performance measures
- Define Sharpe ratio, Treynor Ratio, Sortino ratio, information ratio, and return on VaR and
- Discuss the properties in using the Sharpe ratio
- Calculate Sharpe Ratio, Treynor ratio, Sortino ratio, information ratio, and return on VaR
- Discuss the properties in using the Treynor ratio

Keywords

Sharpe ratio	Sortino ratio	Treynor ratio
return on VaR (RoVaR)	information ratio	

2.8.5 Risk-Adjusted Return Measures

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

- Define Jensen's Alpha and the M2 (M-Squared) approach
- Calculate Jensen’s Alpha and the M2 (M-Squared) approach

Keywords

Jensen's alpha	M^2 approach

2.8.6 Pricing and Historic Data Analysis

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of pricing and historic data analysis.

Including:

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

Keywords

stale prices

2.8.7 Appraisals and Price Smoothing

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of valuation and volatility of private assets.

Including:

- 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 private asset prices
- Compare smoothed returns with market returns

Keywords

smoothing	favorable mark	managed returns
model manipulation	selective appraisals	market manipulation

2.9.1 Overview of Beta and Alpha

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of beta and alpha.

Including:

- Understand the role of beta in the analysis of traditional and alternative investments

- Understand the role of alpha in the analysis of traditional and alternative investments

Keywords

alpha

2.9.2 Return Drivers

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of return drivers.

Including:

- 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

Keywords

return driver	alpha driver	beta driver
linear risk exposure	equity risk premium puzzle	passive beta driver
process drivers	product innovators	

2.9.3 Challenges in Estimating Alpha

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of empirical approaches in estimating alpha and return persistence.

Including:

- Identify the steps involved in estimating alpha from historical performance
- Discuss how an experiment of a fair casino game can illustrate the challenges to empirical analysis of manager skill
- Define abnormal return persistence
- Discuss attribution of idiosyncratic returns to luck or skill
- Interpret estimated return persistence

Keywords

model misspecification	**abnormal return persistence**

2.9.4 Return Attribution, Alpha, and Beta

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of return attribution.

Including:

- Calculate beta, forecasted alpha, and realized alpha
- Discuss 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

Keywords

misestimated betas	**omitted (or misidentified) systematic return factors**	**beta creep**
nonlinear risk-return relation error	**beta expansion**	**beta nonstationarity**

2.9.5 Statistical Issues in Analyzing Alpha and Beta

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of statistical issues in analyzing alpha and beta.

Including:

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

Keywords

spurious correlation	**causality**

Topic 3: Real Assets

3.1.1 Natural Resources Other Than Land

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of natural resources other than land.

Including:

- 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

Keywords

exchange option	**split estate**	**pure play**

3.1.2 Land

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of land as an alternative asset.

Including:

- 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

Keywords

land banking	**blue top lots**	**finished lots**
paper lots	**binomial option pricing**	**risk-neutral probability**
negative survivorship bias	**entitled lots**	**broken lots**
raw land		

3.1.3 Timber and Timberland

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of timber and timberland as alternative assets.

Including:

- 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

Keywords

timberland investment management organizations (TIMOs)

3.1.4 Farmland

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of farmland as an alternative asset.

Including:

- 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

Keywords

cap rate	**agency risk**

3.1.5 Contagion, Price Indices, and Biases

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

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

Keywords

Contagion

3.1.6 Key Observations Regarding Historical Returns of Timberland and Farmland

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of observations regarding historical returns of timberland and farmland.

Including:

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

3.2.1 Investing in Commodities without Futures

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of investing in commodities without futures.

Including:

- Discuss disadvantages of direct investment in physical commodities
- 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
- Describe 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

Keywords

Hotelling's theory	**commodity-linked note**

3.2.2 The Term Structure of Forward Prices on Commodities

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the term structure of forward prices on commodities.

Including:

- Understand the costs of carry for commodities.
- 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.

Keywords

spoilage cost	**inventory shrinkage**	**perfectly elastic supply**
inelastic supply	**contango**	**backwardation**
inelastic demand	**basis**	**basis risk**
calendar spread		

3.2.3 Rolling of Forward and Futures Contracts

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of rolling of forward and futures contracts.

Including:

- 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 relates 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

Keywords

collateral yield	fully collateralized position	roll return
roll yield	spot return	

3.2.4 Normal Backwardation and Normal Contango

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of normal backwardation and normal contango.

Including:

- 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

Keywords

normal backwardation	normal contango	stock-out
working curve	humped curve	volatility asymmetry

3.2.5 Commodity Exposure and Diversification

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of commodity exposure and diversification.

Including:

- Summarize 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

Keywords

inflation risk

3.2.6 Expected Returns on Commodities

Learning Objectives

Upon completion of this lesson, candidates should be able to:3.2.6 Expected Returns on Commodities

Demonstrate knowledge of expected returns and risk attributes on commodities.

Including:

- 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
- 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.

3.2.7 Commodity Futures Indices

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of commodity indices.

Including:

- 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

Keywords

investable index	**production-weighted index**	**Standard & Poor's GSCI (S&P GSCI)**
Bloomberg Commodity Index (BCOM)	**FTSE/Core Commodity Research Bureau (CRB) Index**	

3.2.8 Key Observations Regarding Historical Returns of Commodities

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of observations regarding historical returns of commodities.

Including:

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

3.3.1 Commodity Producers

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of commodity producers.

Including:

- 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.

3.3.2 MLPs – a Real Assets Liquid Alternative

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of liquid alternative real assets.

Including:

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

Keywords

downstream operations	upstream operations	midstream operations
unrelated business income tax (UBIT)	double taxation	

3.3.3 Infrastructure Overview

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of infrastructure in the alternative investment space.

Including:

- Identify the common attributes of investable infrastructure
- Understand the history of infrastructure investing

Keywords

public-private partnership (PPP)		

3.3.4 Infrastructure Classifications

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of infrastructure classifications.

Including:

- Identify the five infrastructure sectors
- Contrast economic infrastructure and social infrastructure
- Understand the role of public-private partnerships in infrastructure investing
- Identify the stages of infrastructure investing

Keywords

greenfield project	**brownfield project**	**social infrastructure**
economic infrastructure	**brownfield phase**	**greenfield phase**

3.3.5 Investing in Infrastructure

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of infrastructure investing.

Including:

- Explain infrastructure investment vehicles
- Contrast the four common types of infrastructure investment styles
- Evaluate the performance of infrastructure relative to inflation

Keywords

closed-end infrastructure funds	**core infrastructure**	**core-plus infrastructure**
value-add infrastructure	**opportunistic infrastructure**	

3.3.6 Opportunities and Risks in Infrastructure

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of risk and opportunities in infrastructure

Including:

- Identify twelve determinants of infrastructure
- Discuss the risks and government regulation of infrastructure investing
- Discuss opportunities and allocations of infrastructure investments

Keywords

regulatory risk	**regulated pricing**

3.3.7 Intellectual Property Overview

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of intellectual property.

Including:

- 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

Keywords

excludable goods	**intangible assets**	**intellectual property**
unbundled intellectual property	**mature intellectual property**	

3.3.8 Cash Flows of Intellectual Property

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of Cash flows of intellectual property

Including:

- 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

Keywords

negative costs	

3.3.9 Visual Works of Art and Historical Performance Data

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

- Discuss the historical performance data of visual works of art

Keywords

Visual works of art	

3.3.10 R&D and Patents as Unbundled Intellectual Property

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

- 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

3.4.1 Categories of Real Estate

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of categories of real estate.

Including:

- Contrast the private and public ownership of real estate
- Discuss the investment continuum of real estate equity and debt investing
- Understand how allocators access residential real estate investments
- Detail the major property types and subcategories of commercial real estate
- Discuss real estate categorization based on market size
- Understand the challenges of international real estate investments

Keywords

residential real estate	**Commercial real estate**	**primary real estate market**
real property	**improvements**	

3.4.2 Advantages, Disadvantages, and Styles of Commercial Real Estate Investments

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

- Discuss seven potential advantages of investing in commercial real estate
- Discuss four potential disadvantages of investing in commercial real estate
- Describe styles of real estate investing
- Understand the core real estate style of investment
- Understand the value-add 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

Keywords

core real estate	value-add real estate	opportunistic real estate

3.4.3 Real Estate Investment Styles

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the three real estate investment styles.

Including:

- Construct a portfolio that would meet real estate policy objectives by utilizing the three investment styles to add portfolio tilts

3.4.4 Introduction to Real Estate – Office Style

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the Office of real estate sector

Including:

- Identify the various types of office properties
- Understand the classification of office properties
- Discuss the factors impacting cap rates of office properties
- Understand the supply and demand dynamics related to office properties

Keywords

class A properties	class B properties	class C properties
central business district		

3.4.5 Introduction to Real Estate – Industrial and Retail

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the Industrial and Retail real estate sectors.

Including:

- Identify the various types of industrial properties

- Identify the various types of retail properties
- Discuss the factors impacting cap rates of industrial properties
- Discuss the factors impacting cap rates of retail properties
- Understand the supply and demand dynamics related to industrial properties
- Understand the supply and demand dynamics related to retail properties

Keywords

anchor tenant	infill assets	percentage rent clause
co-tenancy clause		

3.4.6 Introduction to Real Estate – Multifamily and Other

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the Multifamily and Other Real Estate Sectors.

Including:

- Identify the various types of Multifamily properties
- Identify the various types of Other real estate properties
- Understand the supply and demand dynamics related to multifamily properties

3.5.1 Private Market CRE Capital Stack - Debt

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the debt securities in the private market real estate capital stack

Including:

- Compare the characteristics of first mortgages, A/B structures, second mortgages, mezzanine debt
- Describe a fulcrum security

Keywords

first mortgage	second mortgage	mezzanine debt
equity kicker		

3.5.2 Private Market CRE Capital Stack - Equity and Leases

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the debt securities in the private market real estate capital stack

Including:

- Compare the characteristics preferred equity and common equity
- Describe the purpose of the intercreditor agreement
- Compare the capital stack of a mortgaged fee simple deal to a leveraged asset on a ground lease
- Calculate the total leverage and equity needed for a project on a ground lease

Keywords

preferred equity	**common equity**	**intercreditor agreement**
ground lease	**unsubordinated**	**fee simple**

3.5.3 CRE Mortgage Underwriting Considerations

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

- Describe the analysis of default risk of commercial mortgages
- Identify and apply financial ratios employed in the analysis of commercial mortgage default
- Estimate the effects of leverage on cash-on-cash returns

Keywords

covenants	**recourse**	**cross-collateral provision**
interest coverage ratio	**debt service coverage ratio**	**debt yield**
fixed charges ratio	**positive leverage**	**negative leverage**

3.5.4 Commercial Mortgages

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

- Describe characteristics of the different types of commercial real estate mortgages: construction mortgages, mini-perm construction mortgages, transitional mortgages, and permanent mortgages
- Describe characteristics of commercial real estate first mortgages, first mortgage A/B note structures, second mortgages, and stretched first mortgages
- Understand the advantages and disadvantages to both borrower and lender of each type of mortgage

Keywords

commercial mortgages	transitional mortgage	construction mortgage
permanent mortgage	mini-perm construction mortgage	stretched first mortgage

3.5.5 Private Market CRE Financing Alternatives

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the investment continuum in private market real estate.

Including:

- Contrast the characteristics of mezzanine debt, preferred equity, common equity, and ground leases as alternatives for financing real estate projects
- Describe a fulcrum security

3.5.6 Private Market Real Estate Investment Vehicles

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of alternative real estate investment vehicles.

Including:

- Identify and describe private market real estate investment structures and the subcategories of each structure
- Identify and describe the advantages and disadvantages of each investment structure's subcategories
- 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

Keywords

gearing	real estate joint ventures	syndications

3.5.7 Liquid Alternatives: Commercial Real Estate

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of liquid alternatives: REITs and REOCs.

Including:

- Define types of real estate investment trusts (REITs)
- List advantages and disadvantages of REITs as an investment
- Contrast private and public REITs
- Define the FTSE NAREIT US Real Estate Index Series
- Contrast the structures of REITs and real estate operating companies (REOCs)

Keywords

publicly traded REIT	equity REITs	mortgage REITs
FTSE NAREIT US Real Estate Index Series	Real estate operating companies (REOCs)	

3.6.1 Real Estate Development

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

- Calculate a development yield
- Understand the importance of due diligence in formulating assumptions
- Describe the difference between hard and soft costs
- Understand the relationship between the development yield and the market cap rate and how it can affect the development decision

Keywords

development yield

3.6.2 Commercial Real Estate Valuation

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of commercial real estate valuation.

Including:

- Discuss the importance of commercial real estate equity exposures
- Identify the four appraisal assumptions
- Identify the six items that are included in an appraisal report
- Identify and discuss the three common methodologies used in commercial real estate valuations
- Explain the sales comparison approach and when it is most useful
- Explain the cost approach and when it is most useful
- Explain the income approach and the three subcategories of cap rate, discounted cash flow, and gross income multiplier
- Calculate cap rates
- Calculate a gross income multiplier
- Explain the two ways to calculate a reversion cap rate for a discount cash flow valuation
- Describe the NCREIF property index as an appraisal-based index

Keywords

real estate valuation	**comparable sale prices approach**	**real estate appraisal**
cost approach	**direct capitalization**	**discounted cash flow (DCF)**
gross income multiplier (GIM)	**NCREIF Property Index (NPI)**	

3.6.3 Details of the Income Approach to Real Estate Valuation

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of valuation and risks of real estate equity as well as the income method of real estate valuation.

Including:

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

Keywords

reversion cap rate	effective gross income	fixed expenses
potential gross income	variable expenses	vacancy loss rate
net lease	operating expenses	after-tax discounting approach
risk premium approach	equity residual approach	pre-tax discounting approach

3.6.4 Public Market Real Estate Investment Vehicles

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of alternative real estate investment vehicles and equity REIT returns.

Including:

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

Keywords

stale pricing	Open-end real estate mutual funds	Exchange-traded funds (EFTs)
closed-end real estate mutual fund		

3.6.5 Key Observations Regarding Historical Risks and Returns of Equity REITs

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

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

Topic 4 Private Equity

4.1.1 Introduction to Private Equity

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the terms and background of private equity.

Including:

- Discuss private equity as an asset class and private equity strategies
- Understand the relationship between the business life cycle and stages of private equity investing
- Distinguish between venture capital, growth equity, and buyouts

4.1.2 Overview of Private Equity firms and Funds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of private equity (PE) firms and funds .

Including:

- Define PE funds
- Discuss the organization structure of PE funds
- Understand PE investment by institutional investors
- Discuss PE fund intermediation around efficient inefficiencies
- Identify the five primary functions of PE funds

4.1.3 Managing Institutional Private Equity Investment Programs

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of institutional Investor PE fund programs

Including:

- Describe forms of PE fund intermediation.
- Discuss the life cycle and stages of development of fund investment programs.
- Interpret the fund J-curve.
- Understand undrawn capital commitments.
- Identify the strategies to mitigate substantial risks in PE.

Keywords

commitment risk	**vintage year**	**reinvestment provision**
in-kind distributions	**cash flow J-curve**	**NAV J-Curve**

4.1.4 Subscription Lines in Private Equity

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of subscription lines in private equity

Including:

- Identify the benefits and risks to general partners and limited partner when subscription lines are used
- Apply IRR methodology to determine the change in reported return when subscription lines are used.

Keywords

subscription line of credit (SLOC)		

4.1.5 The LP and GP Relationship Life Cycle

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of growth equity.

Including:

- Understand the relationship between LPs and GPs in PE
- Discuss the three phases in LP and GP relationships

4.1.6 Publicly Traded Private Equity GPs

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of publicly traded PE firms.

Including:

- Understand the governance issues within publicly traded firms
- Contrast PE governance structures

4.1.7 Exit Strategies: IPOs and Direct Listings

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of exit strategies for private equity and venture capital portfolio company investments.

Including:

- Identify the various types of exits available to private equity managers
- Compare strategic mergers to financial mergers or secondary buyouts
- Understand the IPO process
- Discuss Direct Listings

Keywords

buyout-to-buyout deal	direct listing	strategic merger
Special Purpose Acquisition Companies		

4.1.8 Exit Strategies: SPACs

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of SPACs.

Including:

- Understand SPACs
- Compare direct listings, special purpose acquisition corporations (SPACs), and initial public offerings (IPOs), including their advantages and disadvantages.
- Explain how and when the shares of a SPAC can be described as a default-free convertible bond.

Keywords

de-SPAC transaction		

4.2.1 Venture Capital Overview

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of venture capital and its role financing startups

Including:

- Define venture capital opportunities and venture capitalists.
- Discuss the history of venture capital.
- Understand the cash needs for startups and the VC financing model

Keywords

cash burn rate

4.2.2 The Stages of Venture Capital

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the dynamics of venture capital

Including:

- Distinguish between the earlier stages and later stages of venture capital investing
- Contrasts pre-seed, seed, and Series A stages
- Identify investment and company characteristics by stage

Keywords

pre-seed capital stage	seed capital stage	later stage/expansion capital
early-stage venture capital		

4.2.3 Venture Capital Risk and Returns

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of venture capital risk and returns

Including:

- Understand the historical returns of venture capital fund investors
- Explain the risk profile of venture capital investments
- Interpret the j-curve for private equity projects

- Discuss return expectations for venture capital investors

4.2.4 Venture Capital Return Research

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of academic research on venture returns.

Including:

- Understand performance persistence in venture capital returns
- Identify return drivers of venture capital funds
- Apply the conclusions from academic research on VC investing
- Discuss the three primary risk premiums associated with venture capital investing

4.2.5 Venture Capital Valuations

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of venture capital valuation methods.

Including:

- Apply the valuation of VC companies based on Total Addressable Market
- Apply the valuation of VC companies based on operating income.
- Understand the economic rationale for the high discount rates used by venture capitalists.
- Distinguish between pre-money valuation and post-money valuation.

Keywords

venture capital Method	**Total Addressable Market (TAM)**	**post-money valuation**
pre-money valuation		

4.2.6 Venture Capital Financing Decisions

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of venture capital follow-on financing decisions.

Including:

- Discuss the factors in the decision process for follow-on investments
- Discuss venture capital business plans
- Analyze equity dilution in follow-on financings

- Recommend a fund reserve strategy

Keywords

milestone	**exit plan**

4.2.7 Venture Capital Securities

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of venture capital securities.

Including:

- Identify the types of securities used by venture capitalists
- Contrast Simple Agreement for Future Equity (SAFE) with Warrants
- Explain the advantages of using convertible preferred stock

Keywords

simple agreement for future equity	**convertible preferred stock**

4.2.8 Dynamics of Venture Opportunities

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the dynamics of Venture opportunities.

Including:

- Identify implications of winner-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

Keywords

unicorn	**winner-take-all market**

4.2.9 Growth Equity

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of growth equity.

Including:

- 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 the valuation of growth equity based on revenue
- Calculate the valuation of growth equity based on revenue

Keywords

growth equity securities	**redemption rights**	**springing board remedy**
forced sale remedy	**times revenue method**	

4.3.1 An Overview of Buyouts

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of growth equity.

Including:

- Explain the buyout strategy
- Discuss the history of leveraged buyouts
- Discuss three key economic and agency issues of buyouts
- Describe the evolution of the buyout market
- Understand buyout objectives
- Discuss capital structure optimization in buyouts
- Discuss operation efficiency in buyouts
- Discuss merchant banking practices

Keywords

golden parachute	**merchant banking**

4.3.2 Buyout Strategies

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of leveraged buyout (LBO) funds.

Including:

- Identify the categories of LBOs
- Contrast the different types of private equity buyouts

Keywords

secondary buyout	**operational efficiency buyouts**	**entrepreneurship stimulators**
buy-and-build strategy	**turnaround strategy**	**management buyout (MBO)**
management buy-in (MBI)	**buy-in management buyout**	

4.3.3 Buyout Fund Characteristics

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the characteristics of buyout funds.

Including:

- Contrast LBO funds by target cap size
- Analyze 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 factors driving buyout risks relative to VC risks

Keywords

auction process	**club deal**

4.3.4 Leveraged Buyouts

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of leveraged buyouts (LBOs)

Including:

- Calculate projected valuations of an LBO
- Identify LBO exit strategies
- Identify benefits of strong corporate governance principles to the public market

4.3.5 Private Investments in Public Equity

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

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

Keywords

traditional PIPEs	**private investments in public equity (PIPE)**	**structured PIPEs**
toxic PIPE	**equity line of credit**	

4.3.6 Private Equity Liquid Alternatives

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of liquid alternatives in the private equity sector.

Including:

- Describe business development companies (BDCs).
- Calculate the premium (or discount) of closed-end fund prices.
- Understand 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.

Keywords

business development companies (BDCs)	

4.3.7 Long-Hold Buyout Funds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of long-hold buyout funds.

Including:

- Identify the types of funds and assets likely to be held for 15 to 20 years.
- List the benefits and drawbacks of long-hold buyout funds.

Keywords

long-hold private equity funds	

Topic 5 Private Debt

5.1.1 Private Credit Strategies

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of private credit strategies.

Including:

- Define private credit and distressed debt
- Discuss funds with a loan-to-own objective
- Discuss fulcrum securities and reorganization
- Evaluate private credit performance

Keywords

fulcrum security	**loan-to-own investment**

5.1.2 Credit Risk Analysis and the Bankruptcy Process

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of credit risk analysis and the bankruptcy process.

Including:

- Explain the underpinnings of credit risk
- 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

Keywords

credit spread	**covenant-lite loans**	**incurrence covenants**
maintenance covenants	**negative covenants**	**indenture**
affirmative covenants	**recovery rate**	**unitranche**
haircut	**plan of reorganization**	**absolute priority rule**
cramdown	**debtor-in-possession financing**	**default risk**
credit risk		

5.1.3 Bonds and Loans

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of bonds and leveraged loans.

Including:

- Describe the three key differences between bonds and loans
- Understand the basics of leveraged loans
- Discuss growth in leveraged loans
- Explain liquidity and how it relates to the demand for leveraged loans

Keywords

leveraged loans

5.1.4 Direct Lending

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of direct lending.

Including:

- Discuss the process and implications of direct lending

5.1.5 Mezzanine Debt

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of mezzanine debt.

Including:

- 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.

Keywords

warrant	**weighted average cost of capital**	**PIK toggle**
sponsored lending	**bridge financing**	**stretch financing**
takeout provision	**acceleration**	**blanket subordination**
springing subordination		

5.1.6 Advanced Mezzanine Debt Features

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of mezzanine debt.

Including:

- Describe subordinated debt with step-up rates
- Understand and apply subordinated debt with payment-in-kind (PIK) interest
- Describe subordinated debt with profit participation
- Interpret subordinated debt with warrants
- Understand project finance and public-private partnerships

Keywords

subordinated debt with step-	**subordinated debt with**	**subordinated debt with profit**

up rates	warrants	participation scheme
project finance	ticking fee	

5.1.7 Venture Debt

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of venture debt.

Including:

- Describe the characteristics of venture debt.
- Describe the terms of venture debt.
- Explain why a startup firm would issue venture debt in addition to accepting venture capital investments.
- Describe the risks and rewards of venture debt.

Keywords

venture debt

5.1.8 Distressed Debt

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of distressed debt.

Including:

- 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 four broad strategic categories of distressed debt investment.
- Identify risks of investing in distressed debt.

Keywords

credit loss rate	blocking position	Chapter 7 Bankruptcy
Chapter 11 Bankruptcy		

5.2.1 Asset-Based Lending

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of asset-based lending

Including:

- State the characteristics of a typical borrower in asset-based lending
- Explain why borrowers select asset-based lending
- Identify features of asset-based lending
- Discuss discount rates for various assets in asset-based lending
- Describe the use of asset-based lending proceeds
- Identify asset-based loan structures and collateral
- Understand and apply covenants in asset-based lender protection

Keywords

asset-based loan (ABL)	**shadow banking system**	**lockbox**
collateral amount	**borrowing base**	**advance rate**
seasonal overadvance	**traditional overadvance**	**revolver or a revolving line of credit**
term loan	**net leverage covenant**	**fixed charge coverage ratio**

5.2.2 Risks of Asset-Based Securities

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the risks involved in asset-based loans

Including:

- Understand collateral valuation risk of asset-based loans and lender remedies
- Identify risks regarding process and people in asset-based loans
- Understand risks regarding hedging of asset-based loans
- Describe the legal risks of asset-based loans
- Explain risks in exit timing from asset-based loans

Keywords

attachment of security interest	**perfecting the security interest**

5.2.3 Asset-Backed Securities

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of asset-backed securities.

Including:

- Understand how asset-backed securities are created.
- Interpret models showing the growth of various types of asset-backed securities.
- Define auto loan-backed securities and describe their roles.
- Understand how prepayments affect auto loan-backed securities.
- State the role and effect of credit card receivables.
- Understand credit card receivables credit enhancements.

Keywords

recourse loans	non-recourse loan	credit card receivable (CCR)
auto loan-backed securities (ALBS)		

5.2.4 Mortgage-Backed Securities

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of mortgage-backed securities.

Including:

- 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

Keywords

mortgage-backed securities (MBS)	collateralized mortgage obligations (CMOs)	pass-through MBS
residential mortgage-backed securities	conditional prepayment rate	PSA benchmark
idiosyncratic prepayment factors	refinancing burnout	commercial mortgage-backed securities

5.2.5 Residential Mortgages

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of residential mortgages.

Including:

- Discuss and calculate payments of fixed-rate mortgage
- 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

Keywords

fixed-rate mortgage	**amortization**	**variable-rate mortgage**
unscheduled principal payments	**fully amortized**	**index rate**
prepayment option	**interest rate cap**	**margin rate**
negative amortization	**balloon payment**	**subprime mortgages**
option adjustable-rate mortgage	**prime mortgages**	

5.2.6 Key Observations Regarding Historical Returns of Mortgage REITs

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of observations regarding historical returns of mortgage REITs

Including:

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

5.3.1 Nonlife ILS: Catastrophe Bonds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of catastrophe bonds

Including:

- Define catastrophe bonds
- Understand the mechanics of catastrophe bonds
- Describe the risk and returns of catastrophe bonds
- Understand the role of catastrophe bonds in managing risk

Keywords

insurance-linked securities (ILS)	**catastrophe bonds (cat bonds)**	**reinsurance**

5.3.2 Four Trigger Types of Cat Bonds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of catastrophe bonds

Including:

- Define indemnity as a trigger
- Define industry loss as a trigger
- Define parametric as a trigger
- Define modeled as a trigger

Keywords

indemnity trigger	**modeled trigger**	**exhaustion point**
attachment probability	**industry loss trigger**	**parametric**

5.3.3 Cat Bond Valuation, Performance, and Drawbacks

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the overview of financial structuring.

Including:

- Analyze how the coupon rate on catastrophe bonds is constructed.
- Identify catastrophe bond index returns over a recent historical period.
- Understand potential drawbacks and alpha of investing in catastrophe bonds.
  Discuss catastrophe-related derivative securities.

Keywords

complexity arbitrage

5.3.4 Longevity and Mortality Risk-Related Products

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of longevity and mortality risk-related products

Including:

- Define longevity risk
- Explain how longevity risk can be hedged
- Identify the risks of longevity hedging
- Interpret mortality risk
- Understand mortality risk and structured products
- State the main risks of catastrophic mortality bonds

Keywords

credit wrap	**longevity swap contract**	**extreme mortality risk**

5.3.5 Life Insurance Settlements

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the overview of life insurance settlements

Including:

- Define the mechanics and details of life insurance settlements
- Evaluate the path of life insurance policy values through time
- Calculate the present value of a life insurance policy to the policyholder

Keywords

life insurance settlements	

5.3.6 Overview of Viatical Settlements

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the overview of financial structuring.

Including:

- Understand viatical settlement insurance policies
- Describe the benefits, risks, and drawbacks of viatical settlement policies
- Describe the returns of life insurance settlements over a historical period

Keywords

viatical settlement	

5.4.1 Overview of Financial Structuring

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the overview of financial structuring , the major types of structuring, and the primary role of structuring.

Including:

- Describe the most common structuring of assets within the corporate form
- Understand the key elements of a structured product
- Describe hedging with credit derivatives
- Describe structuring with tranches
- Understand how structured products are created
- 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

Keywords

Structuring

5.4.2 Collateralized Mortgage Obligations

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of collateralized mortgage obligations.

Including:

- 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

Keywords

tranche	**sequential-pay collateralized mortgage obligation**	**interest-only (IO)**
extension risk	**planned amortization class (PAC)**	**principal-only (PO)**
targeted amortization class (TAC)	**floating rate trances**	**inverse floater tranche**
contraction risk		

5.4.3 Introduction to Collateralized Debt Obligations

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of collateralized debt obligations.

Including:

- 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

Keywords

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		

5.4.4 Overview of CDO Variations

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of collateralized debt obligations (CDOs).

Including:

- 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

Keywords

bankruptcy remote	**ramp-up period**	**revolving period**
sponsor of the trust	**reference portfolio**	**weighted average rating factor (WARF)**
amortization period	**arbitrage CDOs**	**balance sheet CDOs**
diversity score	**tranche width**	**weighted average spread (WAS)**

5.4.5 Balance Sheet CDOs and Arbitrage CDOs

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of balance sheet CDOs and arbitrage CDOs.

Including:

- Describe three goals for issuing balance sheet CDOs and the balance sheet CDO structure
- Discuss the purposes and attributes of arbitrage CDOs

5.4.6 Mechanics of and Motivations for An Arbitrage CDO

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the mechanics of and motivations for arbitrage CDOs.

With particular emphasis on:

- 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

5.4.7 Cash-Funded CDOs Versus Synthetic CDOs

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of cash-funded CDOs and synthetic CDOs.

Including:

- 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

Keywords

cash-funded CDO	**synthetic CDO**

5.4.8 Cash Flow CDOs Versus Market Value CDOs

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of cash flow and market value CDOs.

Including:

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

Keywords

cash flow CDO	**market value CDO**

5.4.9 Other Types of CDOs

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of new developments in CDOs.

Including:

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

Keywords

distressed debt CDO	**collateralized fund obligation CFO**	**single-tranche CDO**

5.5.1 Risks of CDOs

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the risks of CDOs.

Including:

- Understand the risk of the underlying collateral
- Understand 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

Keywords

risk shifting	**financial engineering risk**

5.5.2 Credit Enhancements

Learning Objectives

Upon completion of this lesson, candidates should be able to:.3.2 Credit Enhancements

Demonstrate knowledge of credit risk and enhancement of CDOs.

Including:

- 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

Keywords

subordination	**internal credit enhancement**	**overcollateralization**
reserve account	**external credit enhancement**	

5.5.3 Credit Derivatives Markets and Risk

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of credit derivatives markets and the five key risks of credit derivatives.

Including:

- Discuss the three economic roles of credit derivatives
- Identify the three major methods for grouping credit derivatives
- Describe the four stages of the evolution of credit derivative activity
- 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

Keywords

credit derivatives	**derivatives**	**single-name credit derivatives**
multiname instruments	**funded credit derivatives**	**unfunded credit derivatives**

5.5.4 Credit Default Swaps

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of credit default swaps.

Including:

- Contrast credit default swaps and total return swaps
- Discuss the standard ISDA agreement as a template for negotiated credit agreements
- Explain 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
- Identify typical credit default swap market participants and their swap transactions
- Explain five typical motivations for using credit default swaps

Keywords

credit default swap (CDS)	**credit protection buyer**	**credit protection seller**
total return swap	**CDS premium**	**CDS spread**
standard ISDA agreement	**cash settlement**	**physical settlement**

referenced asset	mark-to-market adjustment	assignment
novation		

5.5.5 CDS Index Products

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of credit default swap indices.

Including:

- Describe credit default swap index products

Keywords

CDS indices

5.5.6 Other Credit Derivatives

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of credit options and credit-linked notes.

Including:

- Contrast credit default swaps and credit options
- Identify 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

Keywords

American credit options	binary options	European credit options
credit-linked notes (CLNs)		

Topic 6 Hedge Funds

6.1.1 Distinguishing Hedge Funds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the distinguishing features of hedge funds and their growth and concentration over time as well as various types of hedge funds.

Including:

- Describe the three primary elements of hedge funds
- Summarize the investment flexibilities offered by hedge funds
- Discuss the reasons for hedge fund industry growth and concentration
- List hedge fund strategies
- Contrast single-manager hedge funds, funds of funds, and multistrategy funds

Keywords

safe harbor	**multistrategy**	**fund mortality**

6.1.2 Hedge Fund Fees

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of hedge fund fees.

Including:

- Understand typical hedge fund fee arrangements
- Calculate annual hedge fund fees
- Calculate hedge fund fees under different high-water marks (HWMs) and hurdle rates
- Discuss the potential effects of incentive fees on hedge fund manager behavior
- Apply the annuity view of hedge fund fees
- Contrast traditional highwater marks with modified highwater marks

Keywords

high-water mark	**asymmetric incentive fees**	**modified HWM**
perverse incentive	**excessive conservatism**	

6.1.3 Hedge Funds Fees and Manager Behavior

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of manager behavior as it relates to hedge fund fees.

Including:

- Apply the option view of incentive fees and its implications on manager behavior
- Describe the empirical evidence regarding hedge fund fees and managerial behavior

Keywords

closet indexer	**pure asset gatherer**	**lock-in effect**
managing returns		

6.1.4 Hedge Fund Returns and Asset Allocation

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of hedge fund returns and asset allocation.

Including:

- 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

Keywords

absolute return strategies	**diversified strategies**	**equity strategies**
event-driven strategies	**relative value strategies**	**off-balance-sheet risk**
short volatility exposure	**convergent strategies**	**relative return product**

6.1.5 Opportunistic Hedge Funds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

- Explain the approach and benchmarks of opportunistic hedge fund investing

6.1.6 Investing in Multistrategy Funds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of investing in multistrategy funds.

Including:

- Evaluate 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

Keywords

fee netting

6.1.7 Research on Hedge Funds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of research studies on hedge funds.

Including:

- Discuss the evidence regarding findings on hedge fund performance
- 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

Keywords

headline risk

6.1.8 Hedge Fund Indices

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of hedge fund indices.

Including:

- Describe hedge fund indices
- Understand the structure of management and incentive fees on hedge fund indices

- Contrast asset weighted hedge fund indices and equally weighted hedge fund indices
- Understand representativeness and data biases in hedge funds
- Understand and apply strategy definition and style drift
- Discuss index investability of hedge funds

Keywords

fee bias	**instant history bias or backfill bias**	**liquidation bias**
participation bias	**representativeness**	**style drift**
synthetic hedge funds	**investability**	

6.2.1 Macro and Managed Futures Strategies

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of macro and managed futures strategies.

Including:

- Contrast discretionary and systemic trading
- Contrast fundamental and technical analysis

Keywords

discretionary fund trading	**systematic fund trading**	**black-box model trading**

6.2.2 Macro

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of macro hedge fund strategies.

Including:

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

Keywords

macro funds	thematic investing	event risk
market risk		

6.2.3 Managed Futures

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of managed futures.

Including:

- 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

Keywords

managed futures	commodity pool operator (CPO)	commodity trading advisers (CTAs)
commodity pools	private commodity pools	public commodity pools

6.2.4 Systematic Trading

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of systematic trading.

Including:

- 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

Keywords

slippage	in-sample data	out-of-sample data
robustness	validation	degradation
mean-reverting	momentum	moving average
random walk	trend-following strategies	breakout strategies
simple moving average	weighted moving average	exponential moving average
whipsawing	sideways market	

6.2.5 Analysis of Trend Following Strategies

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of Trend Following Strategies.

Including:

- Analyze trend-following strategies as being long volatility
- Analyze non-trend-following strategies as pattern recognition systems
- Discuss relative value strategies and technical analysis

Keywords

countertrend strategies	relative strength index (RSI)	pattern recognition system

6.2.6 Core Dimensions of Managed Futures Investment Strategies

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

- 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

Keywords

multistrategy CTAs

6.2.7 Systematic Futures Portfolio Construction

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of systematic futures portfolio construction.

Including:

- Understand 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

Keywords

volatility targeting	**capital at risk**	**point value**
futures contract dollar risk	**equal dollar risk allocation**	**equal risk contribution**
market capacity weighting	**alpha decay**	

6.2.8 Core Benefits of Managed Futures for Investors

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

- Discuss the benefits of managed futures for investors

6.2.9 Evidence on Managed Futures Returns

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of evidence on managed futures returns.

Including:

- Discuss evidence on alpha generation from managed futures strategies
- 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

Keywords

natural hedger	**capacity risk**	**model risk**
transparency risk	**lack of trends risk**	

6.2.10 Benefits of Managed Futures Funds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of benefits of managed futures funds.

Including:

- 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.

6.3.1 The Sources of Most Event Strategy Returns

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the sources of most event strategy returns.

Including:

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

Keywords

event-driven	**corporate event risk**	**selling insurance**

6.3.2 Activist Investing

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of activist investing.

Including:

- Understand the relationship between corporate governance and activist investing
- Define proxy battle
- 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

Keywords

corporate governance	**shareholder activism**	**proxy battle**
free rider	**agency theory**	**principal-agent relationship**
agency costs	**agent compensation scheme**	

6.3.3 Goals and outcomes of Activism

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of goals and objectives of activism.

Including:

- Understand corporate governance battles.
- Discuss the three activist agendas
- Summarize the key observations on historical activist fund returns that are consistent with economic reasoning.

Keywords

staggered board seats	**interlocking boards**	**spin-off**
split-off		

6.3.4 Merger Arbitrage

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of merger arbitrage.

Including:

- Identify the different types of corporate mergers.
- 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.

Keywords

financing risk	stock-for-stock mergers	traditional merger arbitrage
cash-for-stock mergers	bidding contest	antitrust review

6.3.5 Distressed Securities Funds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of distressed securities hedge funds.

Including:

- 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.

Keywords

one-off transaction	recovery value	liquidation process
reorganization process	Capital structure arbitrage	Financial market segmentation

6.3.6 Event-Driven Multistrategy Funds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of event-driven multistrategy funds.

Including:

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

Keywords

special situation funds	**event-driven multistrategy funds**

6.4.1 Overview of Relative Value Strategies

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of relative value strategies.

Including:

- Understand the relative value strategy
- Describe the classic relative value strategy trade

Keywords

Convergence

6.4.2 An Overview of Convertible Bond Arbitrage

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of convertible bond arbitrage.

Including:

- Describe the classic convertible bond arbitrage trade.
- Define convertible bonds
- Apply the unbundling approach for pricing convertible bonds.
- 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.
- Understand 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.

Keywords

delta-neutral	**busted convertibles**	**complexity premium**
equity-like convertible	**hybrid convertibles**	**dilution**

6.4.3 Return Drivers of Convertible Bond Arbitrage

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of return drivers of convertible bond abitrage.

Including:

- Understand the specifics of delta hedging, including the potential profit on a delta-hedged position.
- Discuss return drivers and risks of convertible bond arbitrage.
- Summarize the key observations on historical convertible arbitrage returns that are consistent with economic reasoning.

Keywords

net delta	**dynamic delta hedging**

6.4.4 An Overview of Volatility Arbitrage

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of volatility arbitrage.

Including:

- Understand the volatility arbitrage strategies.
- 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.
- Understand and apply the challenges of estimating dispersion.
- Understand the dispersion trade.
- Explain profit and loss on dispersion trades.

Keywords

volatility arbitrage	**price transparency**	**anticipated volatility**
pricing risk	**marking-to-model**	**vega notional value**
variance swaps	**volatility swap**	**variance notional value**
marking-to-market	**short correlation**	

6.4.5 Volatility Arbitrage Strategies

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of volatility hedge funds and their strategies

Including:

- Distinguish between the categories of volatility hedge funds
- Describe relative value of volatility funds
- Describe short volatility funds
- Describe long volatility and tail risk funds
- Describe the historical performance of four volatility fund strategies
- Understand market-neutral volatility
- Explain tail risk strategies
- Summarize the key observations on relative value volatility funds returns that are consistent with economic reasoning.

Keywords

tail risk funds	**portfolio risk**	**volatility risk**
correlation risk		

6.4.6 Fixed-Income Arbitrage

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of fixed-income arbitrage.

Including:

- Understand the core of fixed-income arbitrage strategies.
- Describe types and characteristics of fixed-income arbitrage strategies
- Apply the concept of modified duration to bond returns and volatility.
- Describe the characteristics of asset-backed and mortgage-backed securities strategies.
- 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.

Keywords

fixed-income arbitrage	**intracurve arbitrage positions**	**carry trades**
duration-neutral	**intercurve arbitrage positions**	

6.4.7 Relative Value Multistrategy Funds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of relative value multistrategy funds.

Including:

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

6.5.1 Commonalities of Equity Hedge Funds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of commonalities between equity hedge funds.

Including:

- Discuss commonalities of equity hedge funds

Keywords

equity long/short funds	**equity market-neutral funds**	**short-bias funds**

6.5.2 Sources of Return

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of sources of return for equity hedge funds.

Including:

- 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

Keywords

underreacting	**taking liquidity**	**providing liquidity**
market maker	**asynchronous trading**	**informationally efficient**
overreacting	**short interest**	

6.5.3 Market Anomalies

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of market anomalies.

Including:

- Define market anomalies
- 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

Keywords

market anomalies	**accounting accrual**	**price momentum**
earnings momentum	**earnings surprise**	**standardized unexpected earnings**
post-earnings-announcement drift	**net stock issuance**	**illegal insider trading**
legal insider trading		

6.5.4 Implementing Anomaly Strategies

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of implementing anomaly strategies.

Including:

- 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

Keywords

pairs trading	**multiple-factor scoring models**	**market impact**

6.5.5 Application of Equity Shorts

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of various (three) equity strategies.

Including:

- Contrast single stock shorts with market-based shorts
- Understand the role of an alpha short.
- Discuss the goals and risks of pair trades
- Explain the advantages of basket shorts
- Evaluate the use of index shorts in an equity hedge fund portfolio

Keywords

alpha shorts		

6.5.6 The Three Equity Strategies

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of various (three) equity strategies.

Including:

- 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.

Keywords

uptick rule	**mean neutrality**	**variance neutrality**

Topic 7 Digital Assets

7.1.1 Distributed Ledger Technology & Blockchains

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of distributed ledgers and blockchain technology.

Including:

- Explain how a simple distributed ledger works
- Describe how blockchains offer immutable data storage
- Compare the different types of blockchains
- Understand the infrastructure of a decentralized network
- Illustrate how transactions are added and verified on a blockchain
- Explain the double spending problem and how modern blockchains solve it
- Compare consensus mechanisms PoW, PoS, and DPoS
- Describe how SHA-256 hashing works in a PoW system
- Understand how blockchains can update with hard and soft forks
- Understand the blockchain trilemma and the compromises of different systems
- Explain the advantages of a decentralized system

Keywords

distributed ledger technology	**node**	**blockchain**
immutable data	**consensus mechanisms**	**decentralized network**
mempool	**digital wallet**	**elliptic curve digital signature algorithm (ECDSA)**

Proof of Work (PoW)	SHA-256	Proof of Stake (PoS)

7.1.2 Smart Contracts & DeFi

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of how smart contracts are used to build decentralized finance applications.

Including:

- Explain how smart contracts execute within a virtual machine
- Describe how third-party code is deployed on a blockchain
- Explain how dApps are created and connected to smart contracts
- Explain how assets can be tokenized in digital form
- Compare fungible and non-fungible tokens (NFTs)
- Discuss examples of common services in decentralized finance
- Describe how a DAO (decentralized autonomous organization) operates

Keywords

smart contracts	Layer 1 blockchains	Layer 2 solutions
tokens	Non-Fungible Token	decentralized finance (DeFi)
oracles	decentralized application (dApp)	

7.1.3 An Introduction to Bitcoin

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the history and design of Bitcoin.

Including:

- Discuss the relevance and influence global economic conditions had on the creating and timing of Bitcoin
- Explain the original motivations cited in the Bitcoin whitepaper for creating a decentralized currency
- Understand the unspent transaction output model
- Explain the process of a Bitcoin transaction
- Discuss Bitcoin's monetary policy
- Analyze the effect of Bitcoin's monetary policy on the value of Bitcoin
- Explain the Bitcoin mining process
- Evaluate the likelihood and impact of a 51% attack on the Bitcoin network

Keywords

satoshis	unspent transaction output (UTXO) model	hash rate
51% attack		

7.1.4 An Introduction to Ethereum

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the history and design of Ethereum.

Including:

- Discuss the history/creation of Ethereum
- Contrast the Ethereum blockchain with the Bitcoin blockchain
- Explain smart contracts
- Describe the Ethereum Virtual Machine
- Understand the origins of Ethereum Classic
- Evaluate the decision to hard fork the Ethereum blockchain following the DAO hack
- Explain gas
- Distinguish between native and non-native tokens
- Contrast fungible from non-fungible tokens
- Understand the Proof of Stake (PoS) consensus mechanism
- Evaluate the decision for the Ethereum blockchain to transition from Proof of Work (PoW) to PoS
- Describe staking
- Assess the value proposition of Ethereum

Keywords

Ethereum Virtual Machine (EVM)	decentralized autonomous organization (DAO)	Ethereum Classic
gas (gwei)	ERC-20 tokens	ERC-721 tokens
validators		

7.1.5 Payments and Tokens

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of Payments & Token Currencies.

Including:

- Distinguish between the four major digital asset categories
- Understand the major applications of digital payments, including stablecoins, CBDCs, and credit cards
- Evaluate the role of stablecoins within the digital asset ecosystem
- Discuss the current state of central bank digital currencies
- Contrast fungible and non-fungible tokens
- Discuss the various types of tokens and their use cases

Keywords

stablecoins	**central bank digital currencies (CBDCs)**	**DeFi tokens**
security tokens	**governance tokens**	**utility tokens**

7.1.6 DeFi and Web3.0

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of Decentralized Finance and Web3.0.

Including:

- Understand the major applications of decentralized finance (DeFi) and DAOs
- Describe decentralized exchanges
- Explain the role of blockchain oracles
- Contrast DeFi lending and borrowing with traditional financial lending and borrowing
- Discuss DeFi insurance
- Understand yield farming
- Understand the applications of Web 3.0 and its interactions with other applications, including gaming, social media, and financial services

Keywords

decentralized exchanges (DEXs)	**Metaverse**	**parametric insurance**
yield farming	**staking**	**Web 3.0**

7.1.7 Digital Assets in Institutional Portfolios

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of institutional investment in digital assets.

Including:

- Summarize the roles of digital assets in institutional investment portfolios
- Discuss methods institutional investors can follow when starting a digital assets allocation
- Discuss the potential innovations in blockchain technology that could impact institutional investors in the coming years

7.1.8 Due Diligence of Digital Assets

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of institutional due diligence practices for digital assets.

Including:

- Understand due diligence areas of focus unique to digital asset fund investments
- Distinguish between liquid and illiquid market crypto investments
- Describe the various liquid market crypto investment options

7.1.9 Digital Asset Valuation Methods

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of valuation methods for digital assets.

Including:

- Understand why traditional valuation methods may not apply to digital assets
- Explain the stock-to-flow model
- Evaluate bitcoin using the addressable market model
- Evaluate bitcoin using the stock-to-flow model
- Recommend which types of digital assets are suitable for evaluation with the stock-to-flow model
- Explain the cost-of-production model
- Evaluate bitcoin using the cost-of-production model
- Recommend which types of digital assets are suitable for evaluation with the cost-of-production model
- Explain the discounted cash flow model and price multiples
- Recommend which types of digital assets are suitable for evaluation with the discounted cash flow model and/or price multiples
- Explain Metcalfe's law
- Evaluate bitcoin using Metcalfe's law

7.1.10 Risks and Challenges for Digital Asset Investors

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of cryptocurrency and blockchain technology risks.

Including:

- Distinguish between risks related to blockchain technology and risks related to digital assets
- Evaluate liquidity risk of digital assets
- Assess counterparty risk in digital assets
- Assess systemic risk in cryptocurrencies
- Discuss technology/coding risk
- Discuss obsolescence risk
- Analyze governance factors
- Understand the 51% attack
- Understand how future issuance influences inflation
- Explain the issue of scalability
- Evaluate interoperability risk
- Discuss the risk of fraud, hacks, and other scams

7.1.11 Accessing Digital Assets

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of various means of accessing cryptocurrencies .

Including:

- Contrast between direct and indirect access to cryptocurrencies
- Understand the various means of accessing cryptocurrencies
- Discuss the considerations and trade-offs between the various methods of access

Topic 8 Additional Strategies

8.1.1 Overview of Funds of Funds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the basic elements and consideration of Fund of Funds.

Including:

- 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.

Keywords

Operational due diligence

8.1.2 Private Equity Funds of Funds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of funds-of-funds in the private markets.

Including:

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

Keywords

private equity funds of funds (PE FoFs)	

8.1.3 Private Equity Funds of Funds Investment Process

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of the process of investing in PE fund of funds.

Including:

- Identify the varying investment objectives of PE funds of funds (FoF).
- Contrast PE fund of funds and secondary fund of funds.
- Describe the process for constructing a portfolio of PE funds.

Keywords

Primary Fund of Funds	**Secondary Fund of Funds**

8.1.4 Private Equity Funds of Funds Investment

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of investing in PE fund of funds.

Including:

- List the benefits of investing in PE FoF.
- List the disadvantages of investing in PE FoF.
- Describe the factors driving the PE FoF market.

8.1.5 Private Equity Funds of Funds Historical Returns

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of observations regarding historical returns of PE fund of funds.

Including:

- Summarize the key observations on PE fund of fund returns that are consistent with economic reasoning.
- Understand the performance of buyout fund of funds managers against portfolios of direct funds.
- Understand the performance of VC fund of funds managers against portfolios of direct funds.

Keywords

Return dispersion

8.1.6 Overview of Funds of Hedge Funds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

- Define funds of hedge funds.
- Understand the benefits and costs of diversification.
- 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.

8.1.7 Investing in Funds of Hedge Funds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

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

Including:

- 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
- distinguish between the varying investment objectives of funds of hedge funds
- Describe how funds of funds can act as venture capitalists

Keywords

liquidity facility	**seeding funds**

8.1.8 Investing in Portfolios of Single Hedge Funds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of building a portfolio of single hedge funds.

Including:

- 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.

8.1.9 Multialternatives and Other Hedge Fund Liquid Alternatives

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of multialternatives and other hedge fund liquid alternatives.

Including:

- 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

Keywords

nontraditional bond funds	**unconstrained bond funds**

8.1.10 Key Observations Regarding Historical Returns of Funds of Funds

Learning Objectives

Upon completion of this lesson, candidates should be able to:

Demonstrate knowledge of observations regarding historical returns of hedge funds of funds.

Including:

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

Keywords

market-defensive funds of funds	**conservative funds of funds**	**diversified funds of funds**
strategic funds of funds		