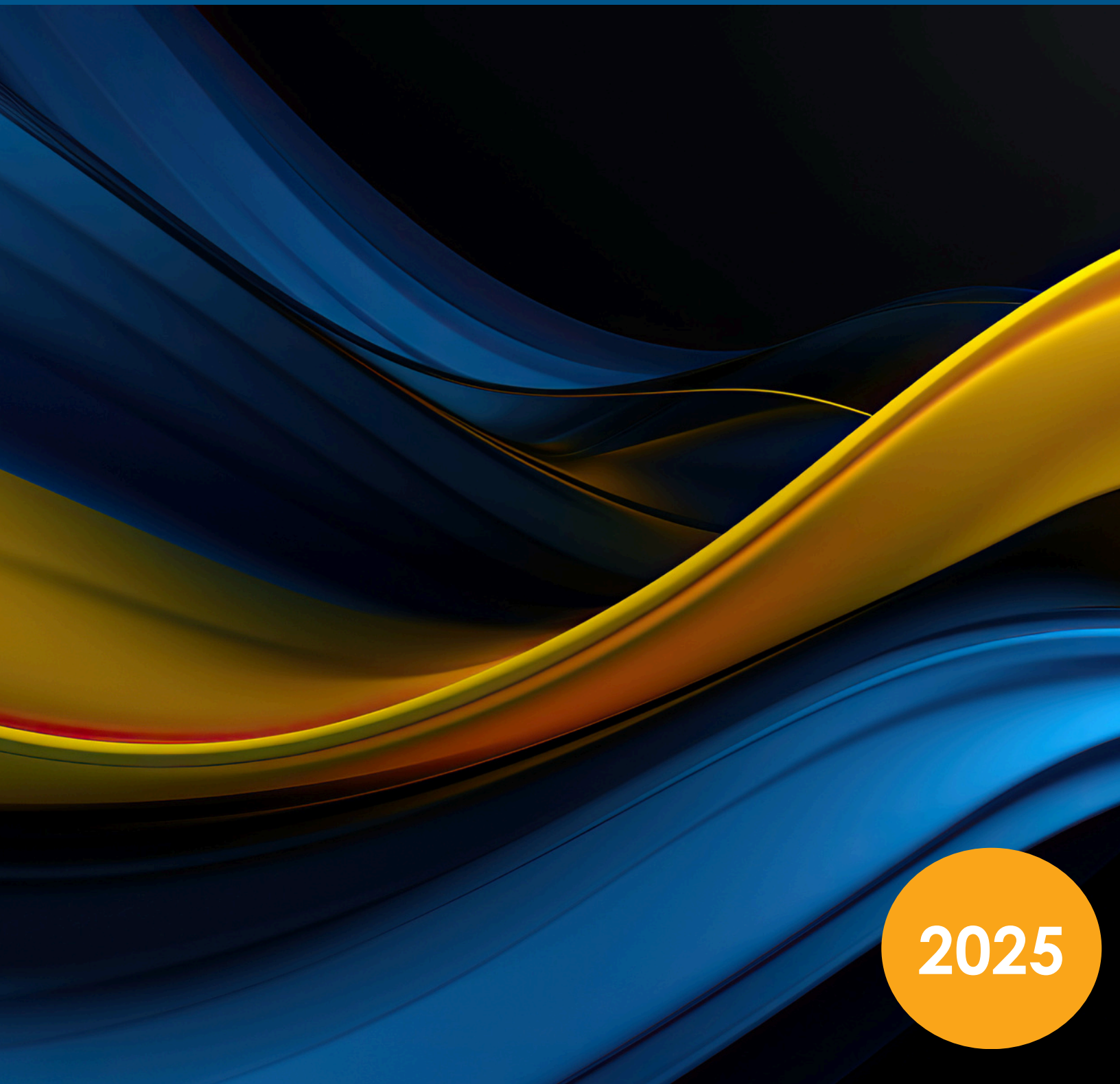
CAIA Level II Curriculum Companion



2025

Topic 1 Institutional Asset Owners

1.1.1 Institutional Asset Owners

Learning Objectives

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

Demonstrate knowledge of endowments and foundations, pension funds, sovereign wealth funds, and family offices

Including:

- Understand the different purposes endowments and foundations serve
- Contrast the four types of pension funds
- Discuss the role of SWFs in today's market
- Understand how family offices operate

Keywords

public pension funds	**individually managed retirement accounts**	

1.1.2 Strategic Asset Allocation: Risk and Return

Learning Objectives

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

Demonstrate knowledge of risk and return within strategic asset allocations

Including:

- Discuss strategic asset allocations based on observation and reasoning
- Understand the reasons that alternative assets raise return estimation challenges
- Understand the reasons for placing caps and floors on asset allocations

1.1.3 Asset Allocation Objectives and Constraints

Learning Objectives

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

Demonstrate knowledge of asset allocation objectives and the constraints within investment policy

Including:

- Explain asset owners' objectives within allocations
- Contrast internal and external constraints
- Identify types of internal constraints

- Identify types of external constraints

Keywords

constraint	**internal constraints**	**objective**
external constraint		

1.1.4 Investment Policy Statements: Purpose and Roles

Learning Objectives

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

Demonstrate knowledge of the purpose of investment policy statements (IPS) and the parties involved in an IPS.

Including:

- Discuss the six benefits of a thoughtfully developed IPS
- Explain the introduction, scope, and purpose of an IPS
- Identify roles and responsibilities within an IPS

Keywords

investment policy statement (IPS)		

1.1.5 Investment Policy Statements: Return, Risk, and Spending

Learning Objectives

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

Demonstrate knowledge of return, risk, and spending policies in investment policy statements (IPS)

Including:

- Discuss investment objectives within an IPS
- Explain time horizons within an IPS
- Discuss risk tolerance within an IPS
- Discuss spending policies within an IPS

1.1.6 Investment Policy Statements: Asset Allocation and Manager Selection

Learning Objectives

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

Demonstrate knowledge of investment guidelines and criteria in investment policy statements (IPS)

Including:

- Discuss asset allocation guidelines within an IPS
- Explain selection and retention criteria for investment managers or funds within an IPS
- Discuss strategic investment guidelines set within an IPS
- Discuss performance measurement and evaluation within an IPS
- Identify additional considerations within an IPS

1.2.1 Defining Endowments and Foundations

Learning Objectives

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

Demonstrate knowledge of foundations and endowments

Including:

- Contrast the differences between foundations and endowments

Keywords

restricted gifts	**corpus**	**foundations**
operating foundations	**community foundations**	**corporate foundations**
independent foundations		

1.2.2 Intergenerational Equity, Inflation, and Spending Challenges

Learning Objectives

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

Demonstrate knowledge of spending challenges arising from inflation within intergenerational equity

Including:

- Understand the factors contributing to the change in endowment value
- Contrast the four approaches to applying a spending rate
- Evaluate the challenge in maintaining the real value of an endowment over time

Keywords

intergenerational equity	**spending rate**	**return target**

1.2.3 The Endowment Model

Learning Objectives

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

Demonstrate knowledge of the endowment model

Including:

- Interpret asset allocation in the endowment model
- State the endowment model's case against bonds
- Understand the role of alternative investments in the endowment model

Keywords

endowment model

1.2.4 Why Might Large Endowments Outperform?

Learning Objectives

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

Demonstrate knowledge of the outperformance of endowments

Including:

- Identify the six attributes of the endowment model
- Discuss aggressive asset allocation within the endowment model
- Discuss effective investment manager research within the endowment model
- Understand first-mover advantage in the endowment model
- Discuss the advantage of access to a network of talented alumni within the endowment model
- Interpret the role of acceptance of liquidity risk in the endowment model
- Explain the advantage of sophisticated investment staff and board oversight within the endowment model
- Identify the outsourced CIO model

Keywords

network effect	illiquidity premiums	outsourced CIO (OCIO) model
non-discretionary investment consultant		

1.2.5 Risks of the Endowment Model

Learning Objectives

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

Demonstrate knowledge of the risks of the endowment model

Including:

- Understand spending rates and spending rules
- Explain the relationship between spending rates and inflation
- Interpret spending rates and liquidity issues
- Understand how spending rates relate to liquidity-driven investors
- Discuss avoiding liquidity issues from a financial crisis
- Identify leverage risk within the endowment model

Keywords

total return investor	**inflation beta**	**liquidity-driven investing**

1.2.6 Liquidity Rebalancing and Tactical Asset Allocation

Learning Objectives

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

Demonstrate knowledge of tactical asset allocation and liquidity rebalancing

Including:

- Understand the relationship between tactical asset allocation and liquidity rebalancing

1.2.7 Tail Risk

Learning Objectives

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

Demonstrate knowledge of tail risk

Including:

- Discuss tail risk and its implications in endowments

Keywords

equity option hedges

1.3.1 Development, Motivations, and Types of Pension Plans

Learning Objectives

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

Demonstrate knowledge of the development, motivations, and types of pension plans

Including:

- Understand how pension plans are developed.
- Discuss motivations for using pension plans.
- Identify the three basic types of pension plans.

Keywords

pension plans	**cash balance plan**

1.3.2 Risk Tolerance and Asset Allocation

Learning Objectives

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

Demonstrate knowledge of risk tolerance and asset allocation in pension plans

Including:

- Contrast the three approaches to managing assets in defined benefit plans
- Identify four factors that drive the impact of liabilities on a plan's risk
- Identify five major factors that affect the risk tolerance of a plan's sponsor
- Understand the two buckets used to strategically allocate assets in a pension plan

Keywords

duration matching approach	**cash flow matching approach**	**overlay approach**

1.3.3 Defined Benefit Plans

Learning Objectives

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

Demonstrate knowledge of defined benefit plans

Including:

- Understand how job mobility and pension plan portability relate
- Define accumulated benefit obligation and projected benefit obligation as liabilities within pension plans
- Describe surplus risk and calculate funded status as they relate to pension plans
- Explain why defined benefit plans are withering
- Understand asset allocation as it relates to liability-driven investing within pension plans
- Discuss liability-driven pension plan investing

Keywords

defined benefit plan	**retirement income-replacement ratio**	**portable**
accumulated benefit obligation (ABO)	**projected benefit obligation (PBO)**	**funded status**
pension surplus	**surplus risk**	**frozen pension plan**
terminated pension plan	**liability-driven investing (LDI)**	**cost of living adjustment (COLA)**

1.3.4 Governmental Social Security Plans

Learning Objectives

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

Demonstrate knowledge of governmental social security plans

Including:

- Identify the background and purpose of governmental social security plans

Keywords

progressive system

1.3.5 Contrasting Defined Benefit and Contribution Plans

Learning Objectives

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

Demonstrate knowledge of the differences between defined benefit and contribution plans

Including:

- Understand the basics of defined contribution plans
- Identify plan differences in portability, longevity risk, and investment options
- Explain asset allocation in defined contribution plans
- Understand the role of target-date funds and alternative investments within pension plans

Keywords

defined contribution plan	**matching contribution**	**drifting asset allocation**
target-date fund		

1.3.6 Annuities for Retirement Income

Learning Objectives

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

Demonstrate knowledge of the role of annuities for retirement income

Including:

- Discuss the financial phases that are relative to retirement
- Identify three important risks to retirees
- Estimate exposure to longevity risk within annuities and calculate the expected economic life of a fund
- Identify two major types of annuities
- Calculate the value of a growth annuity

Keywords

accumulation phase	decumulation phase	mortality tables
immediate annuity	deferred annuity	

1.4.1 Sources of Sovereign Wealth

Learning Objectives

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

Demonstrate knowledge of the sources of sovereign wealth

Including:

- Understand the reserve account of a central bank and the factors influencing the size of the reserve account
- Calculate a given country's account surplus or deficit
- Identify five factors that likely contribute to the appreciation of a country's currency
- Distinguish the risks associated with a country reliant on commodity exports

Keywords

reserve account	balance of payments	current account deficit
capital account surplus		

1.4.2 Four Types of Sovereign Wealth Funds

Learning Objectives

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

Demonstrate knowledge of four types of SWFs

Including:

- Describe the characteristics of stabilization funds
- Describe the characteristics of reserve funds and savings funds
- Describe the characteristics of development funds

Keywords

stabilization fund	**savings funds**	**pension reserve funds**
reserve investment funds	**development funds**	

1.4.3 Establishment and Management of Sovereign Wealth Funds

Learning Objectives

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

Demonstrate knowledge of the establishment and management of SWFs

Including:

- List four common motivations that may lead to the establishment of a SWF
- Discuss the investment management of various types of SWFs
- Describe Dutch disease and discuss various types of sterilization policies
- Discuss managing the size of a SWF

Keywords

Dutch disease	**sterilization**	**reserve adequacy**

1.4.4 Governance and Political Risks of SWFs

Learning Objectives

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

Demonstrate knowledge of the governance and political risks of SWFs

Including:

- Evaluate the governance of SWFs
- Discuss the principles of the Linaburg-Maduell Transparency Index
- Understand the Santiago Principles

Keywords

Linaburg-Maduell Transparency Index	Santiago Principles

1.4.5 Analysis of Three Sovereign Wealth Funds

Learning Objectives

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

Demonstrate knowledge of the economics of the management of three SWFs

Including:

- Analyze the governance and management of the Norwegian Government Pension Fund Global
- Analyze the governance and management of China Investment Corporation (CIC)
- Analyze the governance and management of Temasek Holdings (Singapore)

Keywords

Norway model

1.5.1 Identifying Family Offices

Learning Objectives

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

Demonstrate knowledge of how to identify family offices and their competitive advantages

Including:

- Understand what qualifies as a family office
- Discuss the natural advantages family offices have that help them manage their overall portfolios

Keywords

ultra-high net worth

1.5.2 Goals, Benefits, and Business Models of Family Offices

Learning Objectives

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

Demonstrate knowledge of the goals, benefits, and business models of family offices.

Including:

- Understand various general goals of family offices
- Describe the benefits provided by a family office, as compared to a private bank or traditional asset manager
- Discuss the characteristics of the various models and structures of family offices

1.5.3 Family Office Goals by Generations

Learning Objectives

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

Demonstrate knowledge of generational family office goals

Including:

- Contrast the goals of first-generation wealth with the goals of second generation and beyond wealth
- Understand the risk management practices of first-generation wealth
- Identify the process of benchmarking first-generation wealth

Keywords

new money	old money	concentrated wealth
completion portfolio		

1.5.4 Macroeconomic Exposures of Family Offices

Learning Objectives

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

Demonstrate knowledge of the macroeconomic exposures of family offices

Including:

- Discuss how macroeconomic factors affecting family office investment decisions

1.5.5 Income Taxes of Family Offices

Learning Objectives

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

Demonstrate knowledge of the constraint of income taxes for family offices

Including:

- Discuss how the importance of tax efficiency affects how family office investments are structured
- Contrast the tax impacts of short-term and long-term capital gains in the United States
- Evaluate the benefit to taxable investors of Section 1256 contracts

- Calculate after-tax profits for a given portfolio
- Assess how family offices can increase tax efficiency with hedge funds

Keywords

tax efficiency	**short-term capital gains**	**long-term capital gains**

1.5.6 Lifestyle Assets of Family Offices

Learning Objectives

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

Demonstrate knowledge of the lifestyle assets of family offices

Including:

- Discuss the treatment of art as a lifestyle asset in the management of family wealth
- Discuss storage costs and other costs of lifestyle assets, and describe the function of free ports
- Understand the consideration and use of lifestyle assets as constraints in the asset allocation process when constructing a family office investment portfolio
- Identify concierge services offered through family offices

Keywords

lifestyle assets or passion assets	**free ports**	**balancing portfolios**
concierge services		

1.5.7 Family Office Governance

Learning Objectives

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

Demonstrate knowledge of family office governance

Including:

- Identify structures of governance within family offices
- Explain the challenges of family wealth sustainability
- Identify strategies to maintain family wealth
- Understand the process of family office inheritance and strategies of succession

Keywords

dynastic wealth		

1.5.8 Charity and Philanthropy

Learning Objectives

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

Demonstrate knowledge of charity and philanthropy.

Including:

- Distinguish the primary characteristics of charity and philanthropy

1.5.9 Goals-Based Investing and Private Wealth Portfolios

Learning Objectives

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

Demonstrate knowledge of the considerations private wealth managers must make when investing client portfolios

Including:

- Identify the primary investment goals and constraints of individual investors.
- Describe the time horizons, risk tolerance, and illiquidity tolerance of individual investors.
- Describe the tax considerations for private wealth investors.
- Identify important behavioral finance considerations when advising individual investors on investments.
- Describe the barriers preventing individual investors from gaining access to alternative investments

Keywords

tangible capital	**financial capital**	**human capital**
personal risk	**mental accounting**	**sequence of returns risk**
tax location strategies		

Topic 2 Asset Allocation

2.1.1 Asset Allocation Processes and the Mean-Variance Model

Learning Objectives

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

Demonstrate knowledge of asset allocation processes and the mean-variance model

Including:

- Understand the origin of mean-variance optimization.
- Discuss the tradeoff between expected returns and volatility.
- Evaluate risk and return with utility.
- Interpret and calculate risk aversion and interpret the shape of the utility function.
- Interpret and calculate utility functions in terms of expected returns and variance.
- Interpret and calculate utility functions with higher moments.
- Interpret and calculate utility functions with value at risk.
- Identify investor risk aversion based on the asset allocation decision.
- Understand how to manage assets with risk aversion and growing liabilities.

Keywords

strategic asset allocation decision	**tactical asset allocation**	**modern portfolio theory (MPT)**
degree of risk aversion	**utility**	**expected utility**
utility function	**risk averse**	

2.1.2 Implementation of Mean-Variance Optimization

Learning Objectives

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

Demonstrate knowledge of how the mean-variance optimization is implemented

Including:

- Interpret and calculate mean-variance optimization
- Interpret and calculate mean-variance optimization with a risky and riskless asset
- Interpret and calculate mean-variance optimization with growing liabilities
- Interpret and calculate mean-variance optimization with various degrees of risk aversion

2.1.3 Mean-Variance Optimization with Multiple Risky Assets

Learning Objectives

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

Demonstrate knowledge of mean-variance optimization with multiple risky assets and hurdle rates.

Including:

- Evaluate portfolio optimization with a riskless asset and multiple risk assets
- Assess the value of unconstrained
- Evaluate hurdle rates in the context of a mean-variance optimal portfolio

Keywords

efficient frontier

2.1.4 Issues in Using Optimization for Portfolio Selection

Learning Objectives

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

Demonstrate knowledge of issues using optimization for portfolio selection

Including:

- Interpret optimizers as error maximizers
- Discuss portfolio optimization and smoothing of illiquid returns
- Understand data issues for large-scale optimization
- Understand how mean-variance ignores higher moments
- Discuss three ways to address skewness and kurtosis in mean-variance optimization

2.1.5 Adjustment of the Mean-Variance Approach for Illiquidity

Learning Objectives

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

Demonstrate knowledge of adjustments of the mean-variance approach for illiquidity

Including:

- Understand the liquidity penalty function
- Apply the factor exposure constraint to the liquidity penalty function
- Calculate adjustments for illiquidity
- Calculate adjustments for factor exposure

Keywords

market liquidity risk	funding liquidity risk	liquidity penalty function

2.1.6 Mitigating Estimation Error Risk in Mean-Variance Optimization

Learning Objectives

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

Demonstrate knowledge of how to mitigate estimation error risk in mean-variance optimization

Including:

- Discuss estimation error risk reduction through objective measures of estimation error risk
- Describe sampling to reduce the effect of estimation error
- Discuss shrinkage to reduce the effect of estimation error
- Understand the Black-Litterman approach to mean-variance optimization
- Discuss the use of constraints in mean-variance optimization

Keywords

resampling returns	**shrinkage**

2.2.1 Total Portfolio Approach Overview

Learning Objectives

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

Demonstrate knowledge of the history of the total portfolio approach

Including:

- Justify the criticisms of traditional institutional investment models relative to TPA
- Assess the impact bucketing has on portfolio construction relative to factor or exposure analysis
- Evaluate the perverse role asset class structures can have on the alignment of interest for investment teams
- Explain why traditional institutional investment models may struggle with dynamism

2.2.2 Defining Total Portfolio Approach

Learning Objectives

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

Demonstrate knowledge of the core dimensions of total portfolio approach

Including:

- Discuss the four primary dimensions of TPA
- Understand the use and role of a reference portfolio
- Understand the portfolio construction outcomes from adopting TPA
- Contrast TPA with traditional investment models (i.e., SAA)

Keywords

reference portfolio

2.2.3 Governance of TPA

Learning Objectives

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

Demonstrate knowledge of the role of Governance in the Total Portfolio Approach

Including:

- Discuss the impact of the TPA governance model

2.2.4 Factor Lens in TPA

Learning Objectives

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

Demonstrate knowledge of the role of factors in total portfolio approach

Including:

- Explain how a factor lens is used in a risk-return framework
- Contrast factors with asset classes in building a diversified portfolio
- Apply the four steps in implementing a factor approach
- Discuss the challenges of a factor-based approach

Keywords

factor Lens	**strategic overlay**

2.2.5 Competition for Capital

Learning Objectives

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

Demonstrate knowledge of the competition for capital in the total portfolio approach

Including:

- Explain competition for capital in the context of TPA
- Argue for a competition for capital mindset
- Contrast a competition for capital mindset with portfolio optimization models
- Explain the challenges associated with a competition for capital approach
- Understand how to implement a competition for capital framework

2.2.6 Culture of TPA

Learning Objectives

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

Demonstrate knowledge of the endowment model

Including:

- Evaluate the impact of a long-term focus and agility on the culture of an organization
- Discuss the implementation of a successful total portfolio culture

2.2.7 Implementing TPA

Learning Objectives

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

Demonstrate knowledge of implementing total portfolio approach

Including:

- Understand the TPA best practices
- Summarize the common misconception of TPA
- Discuss the organizational conditions necessary to implement TPA

2.3.1 The Core-Satellite Approach

Learning Objectives

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

Demonstrate knowledge of the core-satellite approach

Including:

- Apply the core-satellite approach

Keywords

core-satellite approach	**core portfolio**	**satellite portfolio**

2.3.2 Top-Down and Bottom-Up Asset Allocation Approaches

Learning Objectives

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

Demonstrate knowledge of top-down and bottom-up asset allocation approaches

Including:

- Understand the bottom-up approach
- Understand the top-down approach
- Understand the mixed approach

Keywords

bottom-up approach	top-down approach	mixed approach

2.3.3 Risk Budgeting

Learning Objectives

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

Demonstrate knowledge of risk budgeting

Including:

- Identify specifications in risk budgeting
- Define risk in risk budgeting as well as risk buckets
- Understand the concept of defining an objective function to obtain a unique solution
- Understand how to include correlations and view of marginal risks
- Understand how to include expected returns with risk budgeting

Keywords

risk budgeting	risk bucket

2.3.4 A Factor-Based Example of Implementing a Risk Budgeting Approach

Learning Objectives

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

Demonstrate knowledge of factor-based implementations of a risk budgeting approach

Including:

- Describe attributing the risk of a portfolio to three attributes of each asset
- Understand how to use factor-based returns and risk buckets
- Calculate the risk contribution to each risk factor

2.3.5 Risk Parity

Learning Objectives

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

Demonstrate knowledge of risk parity

Including:

- Interpret risk parity with two risky assets
- Understand Sharpe Ratios and leverage within risk parity
- Identify the three steps in implementing the risk parity approach
- Discuss how to create a portfolio using the risk parity approach

- Understand the primary economic rationale for the risk parity approach
- Interpret the volatility anomaly and risk parity
- Discuss the criticisms of three popular rationales for risk parity

Keywords

risk parity	leverage aversion theory	volatility anomaly
betting against beta		

2.3.6 Other Quantitative Portfolio Allocation Strategies

Learning Objectives

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

Demonstrate knowledge of other quantitative portfolio allocation strategies

Including:

- Understand the market-weighted strategy
- Interpret an equally-weighted or 1/N diversification strategy
- Describe inverse volatility-weighted portfolio strategies
- Discuss minimum volatility portfolio allocation strategies
- Understand equivalence between allocation strategies
- Describe risk allocation based on return factors
- Understand four practical issues with allocation based on return factors

Keywords

naïve asset allocation strategy	minimum volatility portfolio

2.4.1 Tactical Asset Allocation

Learning Objectives

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

Demonstrate knowledge of tactical asset allocation

Including:

- Understand tactical asset allocation and its various applications

2.4.2 Cash Commitments and Illiquidity

Learning Objectives

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

Demonstrate knowledge of cash commitments and illiquidity

Including:

- Understand the costs of excess illiquidity
- Identify the costs of illiquidity
- Define the overcommitment strategies
- Discuss challenges of identifying illiquidity and managing cash flows
- Identify benefits of private equity cash flow models
- Utilize the overcommitment ratio
- Identify the optimal overcommitment ratio
- Interpret commitments, the global financial crisis, and liquidity

Keywords

commitment risk	**funding risk**

2.4.3 The Fundamental Law of Active Management

Learning Objectives

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

Demonstrate knowledge of the fundamental law of active management (FLOAM)

Including:

- Interpret the central relation equation of the FLOAM and the calculation of its components
- Calculate the transfer coefficient using a modified version of the FLOAM
- Distinguish between the information coefficient and breadth and its key driver

Keywords

Fundamental Law of Active Management (FLOAM)	**breadth**	**information coefficient**
transfer coefficient		

2.4.4 Costs of Actively Reallocating Across Alternative Investments

Learning Objectives

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

Demonstrate knowledge of costs related to actively reallocating across alternative investments

Including:

- Understand incentive fees, foregone loss carryforward costs and the calculation of after-fee return

- Identify two potential costs of staying with a manager below its high-water mark
- Explain two types of potential costs of replacing managers unrelated to incentive fees

2.4.5 Keys to a Successful Tactical Asset Allocation Process

Learning Objectives

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

Demonstrate knowledge of successful tactical asset allocation process

Including:

- Understand the TAA process and return predictability
- Understand the TAA process and model-based return prediction
- Identify important characteristics of sound TAA model development
- Contrast an unconditional analysis with a conditional empirical analysis approach
- Apply conditional analyses using TAA models
- Describe technical analysis underlying TAA models

2.4.6 The Primary Market for PE Partnerships

Learning Objectives

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

Demonstrate knowledge of adjusting exposures to illiquid partnerships

Including:

- Understand the primary markets for PE funds
- Understand PE fund incentives and terms

2.4.7 The Secondary Market for PE Partnerships

Learning Objectives

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

Demonstrate knowledge of the secondary markets for PE partnerships

Including:

- Describe the development of the secondary PE market
- Interpret the size of the secondary market
- Identify PE buyer motivations
- Identify PE seller motivations
- State the secondary market PE investment process
- Interpret and calculate the valuation of secondary PE stakes
- Evaluate limitations of the PE secondary market

Keywords

synthetic secondaries	denominator effect	exit value
exit timing		

2.4.8 GP-Led Secondaries

Learning Objectives

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

Demonstrate knowledge of GP-Led Secondaries

Including:

- Distinguish between the four main types of GP-led secondaries
- Understand the mechanics of continuation funds
- Support the role of GP-led secondaries in the private markets
- Access the risks of continuation funds

Keywords

GP-led secondary	continuation fund	fund recaps
NAV lending	status quo basis	reset basis

Topic 3 Risk and Risk Management

3.1.1 Managing Alpha and Systematic Risk

Learning Objectives

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

Demonstrate knowledge of managing alpha and systematic risk

Including:

- Understand the separating of alpha and beta
- Understand how to hedge systematic risk and calculate the positions necessary to hedge
- Understand and apply the porting of alpha

3.1.2 Managing the Risk of a Portfolio with Options

Learning Objectives

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

Demonstrate knowledge of managing the risk of a portfolio with options

Including:

- Calculate put-call parity as a foundation for risk analysis
- Understand option sensitivities
- Calculate the delta of both call options and put options
- Understand how to view options as volatility bets

Keywords

slack variable

3.1.3 Delta Hedging of Option Positions

Learning Objectives

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

Demonstrate knowledge of delta hedging of option positions

Including:

- Describe the construction of a binomial stock and call option tree in a risk-neutral world
- Describe arbitrage on a properly priced call option and the calculation of a delta neutral position
- Understand how to perform arbitrage on a mispriced call option and the calculation of a delta neutral position
- Apply delta hedging with geometric motion

3.1.4 Key Observations on Delta-Hedging

Learning Objectives

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

Demonstrate knowledge of key observations on delta-hedging and rebalancing delta-neutral option portfolios

Including:

- Identify the three key observations of delta-hedging
- Describe three observations on rebalancing delta-neutral option portfolios

3.1.5 Rebalancing Portfolios with Directional Exposures

Learning Objectives

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

Demonstrate knowledge of rebalancing portfolios with directional exposures

Including:

- Explain rebalancing from the perspective of the expected values of a portfolio
- Understand how to rebalance when assets follow a random walk
- Calculate portfolio rebalancing when individual assets trend
- Calculate portfolio rebalancing when individual asset prices mean-revert
- Interpret the empirical evidence on the effect of rebalancing
- Calculate the effects of rebalancing when prices do not mean-revert

Keywords

rebalancing yield

3.1.6 Mean-Reversion and Diversification Return

Learning Objectives

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

Demonstrate knowledge of mean reversion and diversification return

Including:

- Identify the benefits of mean reversion in commodity investing
- Understand the benefits of mean reversion through portfolio rebalancing
- Identify how volatility reduction enhances geometric mean returns but not expected values
- Summarize the process of rebalancing

Keywords

diversification return

3.1.7 Investment Monitoring

Learning Objectives

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

Demonstrate knowledge of investment monitoring

Including:

- Compare portfolio monitoring and individual asset monitoring
- Identify six activities of monitoring private partnerships
- Explain the objectives of monitoring
- Identify forms of active involvement in the fund's governance process

- Identify forms of active involvement outside the fund's governance process
- Identify three ways to create value through monitoring
- Understand limits to the detail and extent of information available from monitoring

3.2.1 Hierarchy of Alpha

Learning Objectives

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

Demonstrate knowledge of evidence of alpha across the investment universe

Including:

- Assess the historical evidence of alpha across public markets and private markets using the two dimensions of alpha and conclusions from academic research
- Explain the role of dispersion and persistence in evaluating alpha
- Summarize the framework for the hierarchy of alpha
- Contrast the two continua within the hierarchy of alpha
- Explain the importance in understanding the nature and source of alpha

3.2.2 Types of Alpha

Learning Objectives

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

Demonstrate knowledge of types of alpha in the hierarchy of alpha

Including:

- Distinguish the source of true alpha within a return stream
- Analyze the contribution of manufactured alpha within a return stream
- Contrast manufactured alpha with true alpha
- Explain transitional alpha
- Access the sources of transitional alpha emanating from the global financial crisis

Keywords

true alpha	transitional alpha	manufactured alpha

3.2.3 Risk Premia, Betas, and Other Sources of Return

Learning Objectives

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

Demonstrate knowledge of evidence of alpha across the investment universe

Including:

- Describe the contribution of inaccessible risk premium to a return stream
- Contrast transitional alpha with inaccessible risk premium
- Explain alternative beta
- Contrast alternative beta with pure beta
- Argue why alternative beta is no longer classified as a form of alpha
- Assess the role of factors within the hierarchy of alpha

Keywords

inaccessible risk premium	**alternative beta**

3.2.4 Evidence of Manufactured Alpha

Learning Objectives

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

Demonstrate knowledge of analyzing evidence of manufactured alpha

Including:

- Assess performance contributions from manufactured alpha
- Evaluate performance drivers related to multiple expansion
- Understand how allocators can disaggregate drivers for revenue growth

3.2.5 Benchmarking and Performance Attribution Overview

Learning Objectives

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

Demonstrate knowledge of basics in benchmarking and performance attribution

Including:

- Understand the role of active return in benchmarking
- Apply the Bailey criteria for a useful benchmark
- Understand how to select a benchmark for alternatives
- Explain the process of benchmarking liquid alternative investments

Keywords

fund style index	**optimal benchmark**	

3.2.6 Single-Factor Benchmarking and Performance Attribution

Learning Objectives

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

Demonstrate knowledge of single factor benchmarking and performance attribution

Including:

- Describe examples of single-factor benchmarking
- Discuss considerations to be used in benchmarking
- Apply single-factor market model performance in benchmarking
- Analyze time-series returns with a single-factor market-based regression model
- Understand how to apply single-factor benchmarking

3.2.7 Multifactor Benchmarking

Learning Objectives

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

Demonstrate knowledge of multifactor benchmarking

Including:

- Understand multifactor benchmarking
- Understand bias from omitted factors in benchmarking
- Contrast single and multi-factor methods

3.2.8 Distinctions Regarding Alternative Asset Benchmarking

Learning Objectives

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

Demonstrate knowledge of distinctions in alternative asset benchmarking

Including:

- State why the CAPM is unable to be applied to alternative investments
- Explain multiperiod issues in the CAPM
- Understand non-normality issues in the CAPM
- Discuss the illiquidity of returns and other issues with diversification in the CAPM
- Identify investor specific assets and liabilities in the CAPM
- Understand why multiple factor models may be preferable in alternative investments

3.3.1 Benchmarking of Commodities

Learning Objectives

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

Demonstrate knowledge of how to benchmark commodities

Including:

- Contrast the weighting of all positions on value versus quality
- Identify three schemes used to weight commodities sectors and components

- Contrast total return with excess return
- Explain the roll method on returns of commodity indexes
- Contrast the three generations of commodity indices

Keywords

value-based index	quantity-based index	total return index
excess return index	futures curve positioning	roll procedure

3.3.2 Benchmarking Managed Futures Funds

Learning Objectives

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

Demonstrate knowledge of approaches to benchmarking managed futures funds

Including:

- Discuss how to benchmark with long-only futures contracts
- Understand how to benchmark CTAs with peer groups
- Understand how to benchmark CTAs with algorithmic indices
- Evaluate conclusions drawn from evidence on CTA benchmarking

3.3.3 Benchmarking Private Equity Funds

Learning Objectives

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

Demonstrate knowledge of how to benchmark private equity funds

Including:

- Describe listed asset-based benchmarks
- Understand the Long Nickels public market equivalents (LN PME)
- Calculate a PE fund's IRR using the LN PME method
- Understand the Kaplan Schoar public market equivalents (KS-PME)
- Calculate a PE funds KS-PME
- Discuss extensions to the PME Method and other metrics

Keywords

listed PE index		

3.3.4 Peer Group Returns as Benchmarks

Learning Objectives

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

Demonstrate knowledge of peer group returns as benchmarks

Including:

- Understand the peer group method of benchmarking PE fund performance

Keywords

peer-group cohort

3.3.5 Benchmarking Real Estate

Learning Objectives

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

Demonstrate knowledge of benchmarking real estate

Including:

- Understand how to benchmark core real estate with cap rates
- Apply the risk premium formula to benchmark core real estate
- Discuss the approaches to benchmarking non-core real estate
- Describe examples of benchmark return estimates for noncore style assets

Keywords

cap rate spread

3.4.1 Margin Accounts and Collateral Management

Learning Objectives

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

Demonstrate knowledge of margin accounts and collateral management

Including:

- Identify three specialized value terms for futures account levels
- Calculate trading level
- Understand the role of collateral and margin within futures portfolios
- Understand how margin applies across multiple clearing houses
- Measure capital at risk for managed futures

Keywords

trading level	funding level	notional funding
margin-to-equity	cross-margin benefit	variation margin
capital at risk (CaR)		

3.4.2 Value at Risk for Managed Futures

Learning Objectives

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

Demonstrate knowledge of value at risk for managed futures

Including:

- Understand how to calculate value at risk (VaR) for a portfolio
- Describe VaR using a parametric approach
- Describe parametric VaR using a variance based on unequal return weighing
- Calculate confidence intervals with parametric VaR

3.4.3 Other Methods of Estimating Liquidity Needs

Learning Objectives

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

Demonstrate knowledge of other methods of estimating liquidity needs

Including:

- Understand how a simulation analysis can be used to determine managed futures losses
- Evaluate investment returns using the omega ratio

Keywords

omega ratio		

3.4.4 Smoothed Returns on Illiquid Funds

Learning Objectives

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

Demonstrate knowledge of smoothed returns in illiquid funds

Including:

- Understand the concept of smoothing asset returns and unsmoothing
- Interpret price smoothing and arbitrage in a perfect market
- Explain persistence in price smoothing
- Identify problems that arise as a result of price smoothing

3.4.5 Modeling Price and Return Smoothing

Learning Objectives

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

Demonstrate knowledge of model price and return smoothing

Including:

- Calculate reported prices as lags of true prices
- Understand how to model true returns from smoothed returns
- Identify four reasons for smoothed prices and delayed price changes in an index

Keywords

decay function

3.4.6 Unsmoothing a Hypothetical Return Series

Learning Objectives

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

Demonstrate knowledge of how to unsmooth a hypothetical return series

Including:

- Analyze unsmoothed returns using first-order autocorrelation
- Identify the three steps of unsmoothing
- Calculate unsmoothed returns using the aforementioned three steps

Keywords

Unsmoothing

3.4.7 Unsmoothing Actual Real Estate Return Data

Learning Objectives

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

Demonstrate knowledge of how to unsmooth real estate return data

Including:

- Compare smoothed data with market data
- Estimate the first-order autocorrelation coefficient of real estate returns
- Understand how to unsmooth a real estate return series
- Understand the relationship between the variances of true and reported returns and calculate true volatility from smoothed volatility
- Describe the relationship between the betas of true and reported returns and calculate the beta of a true return series
- Interpret the results of unsmoothing a real estate return series

3.5.1 Overview of Risk Measurement

Learning Objectives

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

Demonstrate knowledge of risk measurement

Including:

- Understand what is contained in the investment policy statement
- Identify the five components of risk measurement
- Understand risk measurement at the investment or position level
- Understand how the frequency of data collection affects risk measurement

Keywords

risk management	risk measurement	pricing matrix
exception report		

3.5.2 Overview of Risk Aggregation

Learning Objectives

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

Demonstrate knowledge of risk measurement and aggregation

Including:

- Distinguish between risk aggregation and systems development
- Identify dimensions of risk within risk measurement
- Interpret examples of dimensions of risk reporting for an alternative investment

3.5.3 Categories of Information to Be Considered

Learning Objectives

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

Demonstrate knowledge of information categories to consider

Including:

- Interpret quantitative information categories and their associated statistics
- Interpret due diligence tracking matrices
- Identify qualitative information categories

3.5.4 Data Collection Frequency of Daily, Weekly, or Monthly

Learning Objectives

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

Demonstrate knowledge of risk measurement with daily, weekly, and monthly data collection

Including:

- Understand the role of daily data collection within risk measurement
- Understand the role of weekly data collection within risk measurement
- Understand the role of monthly data collection within risk measurement

3.5.5 Data Collection Frequency of Quarterly or Annual

Learning Objectives

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

Demonstrate knowledge of risk measurement with quarterly data collection and annual data collection or rolling time periods

Including:

- Understand the role of quarterly data collection within risk measurement
- Understand the role of annual data collection within risk measurement

3.5.6 Cybersecurity for Fund Managers

Learning Objectives

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

Demonstrate knowledge of cybersecurity issues for fund managers

Including:

- Evaluate the vulnerabilities to cybersecurity issues within investment organizations
- Understand how to be prepared regarding cybersecurity
- Interpret evidence of regularity of cybersecurity functions
- Interpret evidence of improved policies within certain areas
- Interpret evidence of robust policies and procedures to emulate
- Understand how EU regulations affect cybersecurity
- Understand how Asian regulations affect cybersecurity

3.5.7 Risk Management Structure and Process

Learning Objectives

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

Demonstrate knowledge of risk management structures and their processes

Including:

- Contrast three models of risk management structure
- Understand the investment process as primarily a risk process
- Understand the evolution of risk reporting

Keywords

risk manager

Topic 4 Methods and Models

4.1.1 Types of Models Underlying Investment Strategies

Learning Objectives

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

Demonstrate knowledge of underlying models of investment strategy

Including:

- Compare normative models with positive models
- Distinguish between theoretical and empirical models
- Distinguish between applied versus abstract models
- Compare cross-sectional versus time-series models
- Discuss the importance of methodology in model building

Keywords

exogenous variable	**endogenous variable**	**normative model**
positive model	**theoretical models**	**empirical models**
abstract models	**cross-sectional models**	**time-series models**
panel data sets	**applied Models**	

4.1.2 Intro to Fixed-Income Models

Learning Objectives

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

Demonstrate knowledge of equilibrium models and arbitrage-free models of the term structure

Including:

- Contrast equilibrium fixed-income models with arbitrage-free models
- Apply Vasicek's model
- Contrast the Cox, Ingersoll, and Ross (CIR) model with Vasicek's model
- Discuss the Ho and Lee Model

Keywords

equilibrium models of the term structure	**Vasicek's model**	**Cox, Ingersoll, and Ross model**
Arbitrage-free models of the term structure	**Ho and Lee Model**	

4.1.3 The Black–Derman–Toy Model

Learning Objectives

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

Demonstrate knowledge of the Black–Derman–Toy (BDT) model

Including:

- Interpret a binomial BDT tree
- Understand how to calibrate the level of rates based on average returns
- Understand how to calibrate the spread of rates based on volatilities
- Discuss BDT calibrations in general

Keywords

Black–Derman–Toy Model (BDT model)

4.1.4 The Economics of Credit Risk

Learning Objectives

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

Demonstrate knowledge of credit risk and credit risk modeling

Including:

- Distinguish types of credit events that may lead to an increase in credit risk,
- Explain exposure at default (EAD) and loss given default (LGD)
- Describe how adverse selection and moral hazard relate to credit risk
- Discuss how probability of default (PD) and recovery rate (RR) affect credit risk
- Calculate loss given default and expected loss from credit risk
- Describe the basic concepts of credit risk modeling
- Contrast the three approaches to credit risk modeling

Keywords

credit events

4.1.5 Structural Model Approach Overview

Learning Objectives

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

Demonstrate knowledge of the structural model approach through the lens of the Merton Model

Including:

- Describe Merton's structural model using the option-like nature (both call options and put options) of traditional corporate securities
- Describe the inherent conflict of interest that exists between shareholders and bondholders
- Evaluate advantages and disadvantages of the Merton model
- Understand how binomial trees can be used to value structured products

4.1.6 The Merton Model

Learning Objectives

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

Demonstrate knowledge of the Merton model

Including:

- Apply the Merton model to determine equity values and payoffs to bondholders for a given investment
- Calculate the value of risky debt using the Black Scholes option pricing model
- Evaluate the use of Black-Scholes option pricing in the Merton model
- Analyze the role of credit spreads in structural models and how the credit spread can be used to calculate the price of risky debt
- Understand the four important properties of the Merton model

4.1.7 The KMV Risk Model

Learning Objectives

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

Demonstrate knowledge of the Kealhover, McQuown, and Vasicek (KMV) credit risk model

Including:

- Describe the characteristics and application of the KMV model
- Evaluate the credit score (the distance to default) for a given firm using the KMV model
- Evaluate the expected default frequency for a given investment using the KMV model

Keywords

KMV model	default trigger	distance to default (DD)
expected default frequency (EDF)		

4.1.8 Reduced-Form Models

Learning Objectives

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

Demonstrate knowledge of reduced-form models

Including:

- Describe the characteristics of reduced-form models
- Discuss the role of default intensity in reduced-form models and calculate default intensity for a given firm
- Demonstrate how default intensity can be incorporated into the valuation of risky debt
- Analyze the relationship among credit spreads, default intensities, and recovery rates, and use two of these factors as variables to solve for the third for a given investment
- Describe the two predominant reduced-form credit models

Keywords

default intensity

4.1.9 Empirical Credit Models

Learning Objectives

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

Demonstrate knowledge of empirical credit models

Including:

- Contrast empirical credit models with structural and reduced-form models
- Describe the purpose and characteristics of the Altman Z-score model
- Describe the five financial ratios that are used as inputs to determine Altman Z-scores
- Evaluate Z-scores in Altman's credit scoring model

Keywords

credit score	**Z-score model**

4.2.1 A One-Period Binomial Tree and Risk-Neutral Modeling

Learning Objectives

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

Demonstrate knowledge of one-period binomial trees and risk-neutral modeling

Including:

- Create a one-period binomial model of default risk with risk neutrality
- Understand the modeling of a default risk premium
- Apply p-measures and q-measures in risk-neutral modeling
- Identify four key components of risk-neutral modeling

Keywords

P-Measure	**Q-Measure**

4.2.2 Multi-Period Binomial Trees, Values, and Mean Rates

Learning Objectives

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

Demonstrate knowledge of multi-period binomial trees, values, and mean rates

Including:

- Construct a one-period trinomial tree model based on prices
- Construct a two-period binomial tree model with compounded returns
- Identify three fallacies generated by averaging compounded rates of return
- Understand the advantages to using computer programming to model

4.2.3 Forming Tree Prices with Binomial Tree Model

Learning Objectives

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

Demonstrate knowledge of valuation of convertible securities with a binomial tree model

Including:

- Understand the formation of a binomial tree of stock prices

4.2.4 Valuation of Converts with a Binomial Tree

Learning Objectives

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

Demonstrate knowledge of valuation of convertible securities with a binomial tree model

Including:

- Apply a binomial tree of prices to determine the value of options on equity
- Create a tree of prices for a convertible bond's underlying stock
- Interpret a tree of prices for the convertible bond's underlying stock
- Understand how to value a convertible bond one period prior to its maturity
- Determine, through backward induction, the current value of a convertible bond

Keywords

backward induction

4.2.5 Valuing Callable Bonds with a Tree Model

Learning Objectives

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

Demonstrate knowledge of valuing callable bonds with a tree model

Including:

- Describe a two-period binomial interest rate tree
- Understand how to model the spread between upward and downward shifting rates
- Calculate the price of a straight bond using a two-period binomial tree
- Calculate the price of a callable bond using a two-period binomial tree

4.3.1 Multi-Factor Asset Pricing Models

Learning Objectives

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

Demonstrate knowledge of multifactor asset pricing models

Including:

- Explain multifactor asset pricing
- Understand the role of marginal investor utility in the CAPM and how it relates to asset factors
- Explain how multiple factors relate to “bad times”
- Discuss factors based on expected utility or anomalies
- Identify the three major categories of factors
- Contrast theoretically versus empirically derived multifactor return models
- Identify the fundamentals of empirical models
- Discuss the tradability of factors and the intercepts

Keywords

factor	**multi-factor models**	

4.3.2 Fama-French Models

Learning Objectives

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

Demonstrate knowledge of the original Fama-French Model

Including:

- Contrast the three Fama-French models
- Calculate the original Fama-French model and the Fama-French-Carhart models

Keywords

robust minus weak factor	**conservative minus aggressive factor**	

4.3.3 Three Challenges of Empirical Multi-Factor Models

Learning Objectives

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

Demonstrate knowledge of the three challenges of empirical multifactor models

Including:

- Understand how factors can be falsely identified
- Contrast factor correlation factor causation
- Explain why the CAPM may not be sufficient

4.3.4 Factor Investing

Learning Objectives

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

Demonstrate knowledge of factor investing

Including:

- Discuss the emergence of return factor analysis.
- Identify how return factors are described.
- Explain how risk premiums vary across return factors.
- Explain how factor returns vary across market conditions.
- Explain the relationship between return factors and investability.
- Interpret risk allocation based on return factors.
- Understand performance with allocations based on return factors

Keywords

momentum crash

4.3.5 The Adaptive Markets Hypothesis

Learning Objectives

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

Demonstrate knowledge of the adaptive markets hypothesis (AMH) and time-varying volatility

Including:

- Evaluate the practical implication of the Adaptive Markets Hypothesis
- Explain how equity market volatility is predictable
- Explain how volatility is negatively correlated with average returns
- Discuss time-varying volatility in the context of multiple factors as well as higher moments

Keywords

Adaptive Markets Hypothesis (AMH)	Time-Varying Volatility	The Bates Model
The Heston Model		

4.3.6 Stochastic Discount Factors

Learning Objectives

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

Demonstrate knowledge of stochastic discount factors

Including:

- Calculate traditional discount factors
- Interpret stochastic discount factors
- Calculate the present value of a cash flow in one period based on stochastic discount factors
- Discuss the importance of stochastic discount factors

Keywords

stochastic discount factors

4.4.1 Efficiently Inefficient Markets

Learning Objectives

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

Demonstrate knowledge of efficiently inefficient markets

Including:

- Define an efficient inefficient market and identify how and why it exists
- Understand the two paradoxes of informational market efficiency

Keywords

directional strategies	**efficiently inefficient markets**	

4.4.2 Technical Directional Strategies: Trend Following

Learning Objectives

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

Demonstrate knowledge of trend following technical directional strategies

Including:

- Identify the metrics of technical analysis
- Define the various trendsetting or momentum models

Keywords

technical directional strategies	point and figure chart	time-series momentum
momentum strategy	cross-sectional momentum	

4.4.3 Technical Directional Strategies: Divergence

Learning Objectives

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

Demonstrate knowledge of divergence technical directional strategies

Including:

- Understand market divergence
- Interpret the signal-to-noise ratio
- Define market divergence and calculate the signal-to-noise ratio
- Understand and calculate the market divergence index
- Identify technical strategies based on machine learning
- Interpret the risks of directional technical strategies

Keywords

divergence	signal-to-noise ratio	market divergence index (MDI)
genetic algorithms	neural network	crisis alpha

4.4.4 Fundamental Directional Strategies

Learning Objectives

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

Demonstrate knowledge of fundamental directional strategies

Including:

- Define fundamental directional strategies
- Understand the bottom-up approach of fundamental analysis
- Identify four procedures within the fundamental investment process
- Identify four mechanics of fundamental strategies
- Understand the top-down approach of fundamental analysis
- Describe schools of thought within top-down fundamental analysis
- Discuss risks of directional fundamental strategies

Keywords

fundamental risk	noise traders	
model-based global macro managers	feedback-based global macro managers	information-based global macro managers

4.4.5 Directional Strategies and Behavioral Finance

Learning Objectives

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

Demonstrate knowledge of directional strategies and behavioral finance

Including:

- Describe the six sentiment indicators.
- Describe overconfidence and its role in finance.
- Explain behavioral biases from over-reliance on the past.
- Identify other potential sources of pricing anomalies.

Keywords

prospect theory	**sentiment**	**market frictions**
dividend premium	**anchoring**	**confirmation bias**
loss aversion/disposition effect		

4.4.6 Directional Trading and Factors

Learning Objectives

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

Demonstrate knowledge of factors in directional trading

Including:

- Contrast investment style classifications such as value and growth
- Define directional trading based on momentum
- Discuss emphasis on illiquidity premiums

4.5.1 Statistical Factors and Principal Component Analysis

Learning Objectives

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

Demonstrate knowledge of statistical factors in principal component analysis

Including:

- Define principal component analysis and its factors
- Understand the basics of principal component analysis
- Identify two primary outputs of principal component analysis
- Interpret examples of applying and interpreting principal component analysis

- Contrast principal component analysis and factor analysis

Keywords

Principal Component Analysis (PCA)	eigenvalue	factor loadings
factor analysis (FA)		

4.5.2 Multifactor Models and Regression

Learning Objectives

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

Demonstrate knowledge of multifactor models and regression

Including:

- Interpret the multifactor regression model such as the Fama-French model
- Understand the two primary adverse effects of multicollinearity
- Explain the selection of the number of factors and overfitting of a regression model

Keywords

multiple regression model	overfitted models	multicollinearity
stepwise regression		

4.5.3 Partial Autocorrelations and Regression

Learning Objectives

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

Demonstrate knowledge of partial autocorrelations and regression

Including:

- Understand return autocorrelation and partial autocorrelation
- Estimate partial autocorrelation
- Interpret partial autocorrelations of a return series based on appraisals

Keywords

n^{th} order partial autocorrelation coefficient	partial autocorrelation coefficient

4.5.4 Three Dynamic Risk Exposure Models

Learning Objectives

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

Demonstrate knowledge of dynamic risk exposure models

Including:

- Understand positions with nonlinear exposures
- Understand the dummy variable approach to dynamic risk exposures
- Define the separate regression approach to dynamic risk exposures
- Describe the use of a quadratic model to explain market timing performance

Keywords

nonlinear exposure	

4.5.5 Two Approaches to Modeling Changing Correlation

Learning Objectives

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

Demonstrate knowledge of approaches to modeling changing correlation

Including:

- Define the conditional correlation modeling approach
- Discuss examples of conditional correlations
- Interpret variations on conditional empirical analyses
- Describe and apply the rolling window modeling approach

Keywords

conditional correlation	**rolling window analysis**

4.5.6 Four Multi-factor Approaches to Understanding Returns

Learning Objectives

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

Demonstrate knowledge of multifactor approaches to understanding returns

Including:

- Understand style analysis and fund groupings based on asset classes
- Identify funds based on strategies
- Describe funds based on market-wide factors

- Understand funds based on specialized market factors

Keywords

style analysis	**look-back option**	**specialized market factors**

4.5.7 Evidence on Fund Performance Persistence

Learning Objectives

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

Demonstrate knowledge of evidence on fund performance persistence

Including:

- Understand performance persistence based on return correlations
- Understand performance persistence based on risk-adjusted returns
- Understand performance persistence based on portfolio returns

Keywords

joint hypothesis

4.6.1 Overview of Relative Value Methods

Learning Objectives

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

Demonstrate knowledge of relative value methods

Including:

- Understand the importance of market inefficiencies with respect to relative value strategies
- Contrast pure arbitrage with risk arbitrage
- Identify the limits to arbitrage
- Interpret examples of nearly pure arbitrage
- Identify the steps of pairs trading and types of pairs trading
- Discuss examples illustrating risk arbitrage opportunities

Keywords

risk arbitrage	**pure arbitrage**	

4.6.2 Statistical Pairs Trading of Equities

Learning Objectives

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

Demonstrate knowledge of statistical pairs trading of equities

Including:

- Calculate statistical pairing with the co-integration approach
- Understand the timing of trade entry opportunities
- Define the nature and performance of pairs trading strategies

Keywords

statistical pairs trading	**co-integration approach**	**co-integrated stock prices**
stationary		

4.6.3 Pairs Trading in Commodity Markets Based on Spreads

Learning Objectives

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

Demonstrate knowledge of pairs trading in commodity markets based on spreads

Including:

- State the three dimensions of commodity relative value strategies
- Identify different commodity derivatives calendar spreads
- Estimate the profitability of calendar spread trading
- Understand processing spreads
- Understand the two conditions that that hold for producers that are hedgers
- Evaluate substitution spreads
- Describe quality spreads and location spreads
- Interpret intramarket relative value strategies

Keywords

transportation strategies	**commodity spreads**	**calendar spread**
bull calendar spread	**bear calendar spread**	**synthetic weather derivative**
processing spreads	**crack spread**	**crush spreads**
substitution spreads	**storage strategies**	**quality spreads**
location spreads	**correlation trade**	

4.6.4 Pairs Trading in Rates from Fixed Income and Currency Markets

Learning Objectives

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

Demonstrate knowledge of pairs trading in rates from fixed income and currency markets

Including:

- Understand and apply the concept of a carry trade such as covered interest rate parity

Keywords

covered interest rate parity	

4.6.5 Relative Value Market-Neutral Strategies and Portfolio Risks

Learning Objectives

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

Demonstrate knowledge of relative value market-neutral strategies and portfolio risks

Including:

- Identify different risks of pairs trading strategies
- Describe equity market-neutral strategies
- Describe risks related to equity market neutrality

Keywords

noise traders' risk	**synchronization risk**	**short-sale risk**
monetary neutral	**beta neutral**	**sector neutral**

4.7.1 Depreciation Tax Shields

Learning Objectives

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

Demonstrate knowledge of depreciation tax shields

Including:

- Understand the depreciation tax advantage
- Calculate the present value of depreciation tax shields
- Describe depreciation as generating an interest free loan

Keywords

depreciation tax shield	**recaptured depreciation**	

4.7.2 Deferral of Taxation of Gains

Learning Objectives

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

Demonstrate knowledge of deferral of taxation of gains

Including:

- Calculate after-tax return without tax deferral
- Calculate after-tax returns with the tax deferral of gains
- Understand the income tax benefits of leveraged real estate

4.7.3 Comparing After-Tax Returns for Various Taxation Scenarios

Learning Objectives

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

Demonstrate knowledge of how to compare after-tax returns for various taxation scenarios

Including:

- Contrast stated tax rate and effective tax rate
- Interpret real estate without taxation
- Interpret after-tax returns when depreciation is not allowed
- Identify the four principles of depreciation and returns
- Calculate returns when accounting depreciation equals economic depreciation
- Calculate returns when accounting depreciation is accelerated
- Calculate returns when capital expenditures can be immediately and fully expensed
- Understand the relationship between an investor's tax bracket and tax advantaged investments

Keywords

accelerated depreciation		

4.7.4 Transaction-Based Indices

Learning Objectives

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

Demonstrate knowledge of various in transaction-based indices and their biases

Including:

- Appy the repeat-sales method

- Identify advantages of the repeat-sales method
- Identify disadvantages of the repeat-sale method
- Analyze the hedonic pricing method
- Identify steps in calculating an hedonic price index
- Apply the hedonic pricing approach
- Identify primary advantages of the hedonic pricing model
- Identify primary disadvantages of the hedonic pricing model
- Contrast the various indices and biases

Keywords

transaction-based real estate indices	**the Hedonic Pricing Method**	**repeat-sales method (RSM)**

4.7.5 Appraisal-Based Indices

Learning Objectives

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

Demonstrate knowledge of appraisal-based indices

Including:

- Contrast the various approaches to appraisals
- Identify advantages of appraisal-based models
- Identify disadvantages of appraisal-based models
- Distinguish between the types of pricing errors
- Understand the square root of N rule

Keywords

appraisal-based indices	**sales comparison approach**	**cost approach**
income approach	**reservation price**	**temporal lag basis**

Topic 5 Accessing Alternative Investments

5.1.1 An Overview of Replication Products

Learning Objectives

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

Demonstrate knowledge of replication products and their potential benefits

Including:

- Understand basics of hedge fund replication products
- Evaluate the potential benefits to investors of using replication products

Keywords

hedge fund replication products	**algorithmic replication approach**

5.1.2 The Case for Hedge Fund Replication

Learning Objectives

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

Demonstrate knowledge of the case for using hedge fund replication

Including:

- Estimate the risk and return of a given fund of hedge funds.
- Describe three theories for the increased beta and decreased alpha in hedge fund returns.
- Contrast the level of alpha that is generated by the aggregate of hedge fund managers with the alpha available to investors who select individual managers.
- Discuss how replication products can serve as a source of alpha or alternative beta.

Keywords

fund bubble hypothesis	**capacity constraint hypothesis**	**increased allocation to active funds hypothesis**

5.1.3 Unique Benefits of Replication Products

Learning Objectives

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

Demonstrate knowledge of the benefits of replication products

Including:

- Identify two reasons to use replication products
- Evaluate issues regarding the benefits of fund replication
- Understand potential unique benefits from hedge fund replication

5.1.4 Factor-Based Approach to Replication

Learning Objectives

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

Demonstrate knowledge of factor-based approaches to replication

Including:

- Identify primary issues in constructing a factor-based replication product
- Identify the steps involved in factor-based replication
- Understand current research on factor-based replication
- Describe the payoff-distribution approach to factor replication

Keywords

payoff-distribution approach	view commonality	exposure inertia

5.1.5 The Algorithmic (Bottom-Up) Approach

Learning Objectives

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

Demonstrate knowledge of the algorithmic (bottom-up) approach

Including:

- Understand the basics of the algorithmic (or bottom-up) approach
- Describe the algorithmic approach to merger arbitrage factor replication
- Describe the algorithmic approach to convertible arbitrage factor replication
- Describe the algorithmic approach to momentum factor replication

Keywords

algorithmic approach

5.2.1 Evidence Regarding Hedge Fund Risk and Returns

Learning Objectives

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

Demonstrate knowledge of evidence regarding hedge fund risk and returns

Including:

- Interpret evidence regarding performance of hedge funds by strategies

- Interpret evidence regarding the systematic and total risk of hedge funds
- Interpret evidence regarding correlations and diversification of hedge funds

5.2.2 Approaches to Accessing Hedge Funds

Learning Objectives

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

Demonstrate knowledge of the approaches used by investors to gain hedge fund exposure

Including:

- Discuss the advantages and disadvantages of the direct approach to obtaining hedge fund exposure in portfolios.
- Describe the five services provided as part of the delegated approach to obtaining hedge fund exposure in portfolios.
- Describe the index approach to obtaining hedge fund exposure in portfolios.

5.2.3 Characteristics of Funds of Hedge Funds

Learning Objectives

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

Demonstrate knowledge of the characteristics of funds of hedge funds

Including:

- Understand the approach to manager selection of funds of hedge funds
- Identify ways that funds of hedge funds can be grouped or categorized
- Understand how typical hedge fund biases can be reduced when applied to funds of hedge funds
- Contrast funds of hedge funds with multistrategy funds

Keywords

diversified funds of hedge funds	**tactical funds of hedge funds**	**single-strategy funds of hedge funds**
concentrated funds of hedge funds		

5.2.4 Fund of Hedge Funds Portfolio Construction

Learning Objectives

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

Demonstrate knowledge of approaches to fund of hedge funds portfolio

Including:

- Distinguish between the six different approaches to constructing a fund of hedge funds portfolio

5.2.5 Ways That Funds of Hedge Funds Can Add Value

Learning Objectives

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

Demonstrate knowledge of how funds of hedge funds add value for investors

Including:

- Discuss three approaches used by funds of hedge funds managers to add value for their investors (i.e., through strategic allocation, through tactical allocation, and through fund selection)
- Analyze evidence regarding value added using these approaches by fund of hedge fund managers

5.2.6 Investable Hedge Fund Indices

Learning Objectives

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

Demonstrate knowledge of hedge fund indices and alternative mutual funds

Including:

- Identify factors contributing to the development of hedge fund indices and arguments presented against hedge fund index investing
- Describe the desirable characteristics of investment indices and the challenges of creating representative, investable hedge funds indices
- Discuss investable hedge fund indices
- Describe the three potential benefits of offering alternative mutual funds
- Describe the three benefits of alternative mutual funds to investors
- Describe the three risks of alternative mutual funds
- Describe the three advantages of exchange-traded alternative funds

5.3.1 Overview of Issues in Private Versus Listed Investment Access

Learning Objectives

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

Demonstrate knowledge of issues in private and listed investment access

Including:

- Define financial market segmentation
- Identify potential advantages of listed assets

- Identify potential advantages of privately organized assets
- Understand the relative amount of fees charged on investments
- Describe the role that governance plays in the creation of wealth through private equity

5.3.2 Unlisted Real Estate Funds

Learning Objectives

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

Demonstrate knowledge of unlisted real estate funds

Including:

- Understand the role and purpose of open-end real estate funds
- Understand the role and purpose of closed-end real estate funds
- Describe real estate funds of funds
- Justify the role of non-traded REITs
- Understand the potential advantages of unlisted real estate funds

Keywords

open-end real estate funds	**property unit trusts (PUTs)**	**unauthorized PUTs**
authorized PUTs (APUTs)	**property authorized investment funds (PAIFs)**	**closed-end real estate funds**
matched-bargain system	**tax-transparent investment vehicle**	**closed-end real estate mutual funds (CEMFs)**
non-traded REITs		

5.3.3 Private Equity Real Estate Performance Drivers

Learning Objectives

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

Demonstrate knowledge of the return drivers of private equity real estate funds

Including:

- Discuss how the return to private equity real estate funds varies by international exposure, GDP growth, vintage year, credit spreads, and public real estate returns.
- Discuss how diversification across vintage years impacts the risk of a portfolio of private real estate funds.

Keywords

vintage year diversification	**vintage volume**

5.3.4 Listed Real Estate Funds

Learning Objectives

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

Demonstrate knowledge of listed real estate funds

Including:

- Contrast REITs with REOCs
- Interpret exchange-traded funds based on real estate indices
- Identify potential advantages of listed real estate funds
- Identify potential disadvantages of listed real estate funds
- Understand the role and accessibility of global REITs

Keywords

real estate operating company (ROEC)

5.3.5 Investing in Commodities

Learning Objectives

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

Demonstrate knowledge of ownership methods of commodities

Including:

- Describe the concept and process of direct physical ownership of commodities
- Describe the concept and process of indirect ownership of commodities
- Interpret commodity index swaps
- Understand and interpret public commodity-based equities
- Describe the ownership of commodities through bonds
- Understand how commodity-based mutual funds and exchange-traded products allow for exposure

Keywords

commodity index swap		

5.3.6 ETNs and Private Market Commodity Investing

Learning Objectives

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

Demonstrate knowledge of ETNs and private market commodity funds

Including:

- Describe public and private commodity partnerships
- Understand how commodity-linked investments operate
- Understand how commodity-based hedge funds operate
- Understand the process of financing commodity trades and production

Keywords

commodity exchange-traded note	**commodity index-linked note**	**prepaid forward contracts**

5.3.7 Leveraged and Option-Based Structured Commodity Exposures

Learning Objectives

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

Demonstrate knowledge of leveraged and option-based structured commodity exposures

Including:

- Identify exposures that leveraged and inverse commodity index-based products create
- Identify exposures of leveraged notes
- Identify the role of principal-guaranteed notes

Keywords

leveraged note	**principal-guaranteed commodity notes**	**cash-and-call strategy or participation note**

5.3.8 Key Concepts in Managing Commodity Exposure

Learning Objectives

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

Demonstrate knowledge of key concepts in managing commodity exposure

Including:

- Understand roll return in the context of commodity exposure
- Describe potential cycles of commodity prices and returns

- Describe the relationship between commodity prices and key economic variables

5.4.1 Evidence on an Illiquidity Premium from Listed Assets

Learning Objectives

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

Demonstrate knowledge of evidence regarding illiquidity premiums from listed assets

Including:

- Understand a factor-pricing-based explanation for illiquidity premiums
- Interpret empirical evidence of illiquidity premiums in US treasuries
- Interpret empirical evidence of an illiquidity premium in US equities

Keywords

asset illiquidity	**on-the-run issue**	

5.4.2 Private Versus Listed Real Performance: The Case of Real Estate

Learning Objectives

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

Demonstrate knowledge of private and listed real performance in real estate

Including:

- State the case against unlisted real estate pools based upon historical performance
- Explain the divergent performance between private properties and listed properties
- State the case against unlisted real estate pools based upon risk-adjusted performance

5.4.3 Challenges with the PME Method to Evaluating Private Asset Performance

Learning Objectives

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

Demonstrate knowledge of challenges in the PME method to evaluate private asset performance

Including:

- Understand and apply the interim internal rate of return.
- Explain why IRRs under the LM PME method cannot be calculated in some cases.
- Identify why IRRs fail to adjust for scale and timing.
- Justify using the PME method evaluating performance.
- Analyze how the PME method can be manipulated.

5.4.4 Multiple Evaluation Tools

Learning Objectives

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

Demonstrate knowledge of multiple evaluation tools

Including:

- Understand and apply simple cash flow multiples as an evaluative performance metric
- Interpret private equity fund benchmark analysis
- Understand how to apply a PME analysis to PE funds
- Interpret results using multiple evaluation tools

5.4.5 IRR Aggregation Problems for Portfolios

Learning Objectives

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

Demonstrate knowledge of IRR aggregation problems for portfolios

Including:

- Calculate equal weighting IRRs or IIRRs as measures of performance
- Calculate commitment weighting IRRs or IIRRs as measures of performance
- Calculate pooled cash flows for weighting IRRs or IIRRs as measures of performance
- Apply time-zero based pooling
- Contrast the weighting approaches for IRR or IIRR

Keywords

commitment-weighted IRR	**pooled IRR or IIRR**	**time-zero based pooling (or time-zero pooling)**

5.4.6 Considerations for Investing in Private Funds

Learning Objectives

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

Demonstrate knowledge of considerations when investing in private funds

Including:

- Evaluate the key empirical findings regarding PE fund performance
- Understand two propositions regarding allocating assets in private or listed markets

Topic 6 Due Diligence and Selecting Managers

6.1.1 The Importance of Fund Selection and the Relationship Life Cycle

Learning Objectives

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

Demonstrate knowledge of the importance of fund selection across managers through time and the relationship between GPs and LPs

Including:

- Compare the performance of high and low quartile PE fund managers through time
- Understand the dynamic between PE GPs and LPs
- Explain adverse selection in GP-LP relationships
- Describe the life cycle aspect of the GP-LP relationship
- Identify the entry and establish phase of PE Funds
- Identify the build and harvest phase of PE Funds
- Identify the decline or exit phase

Keywords

GP-LP lifecycle	**build and harvest phase**	**entry and establish phase**

6.1.2 Fund Return Persistence

Learning Objectives

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

Demonstrate knowledge of fund return persistence

Including:

- Describe the fund performance persistence hypothesis
- Interpret evidence regarding fund performance persistence
- Explain transition matrices and return persistence in PE funds
- Understand the persistence of return persistence in PE funds
- Identify challenges to the performance persistence hypothesis
- Describe performance persistence implementation issues

Keywords

fund performance persistence	**fund performance persistence hypothesis**	**gatekeepers**
transition matrix		

6.1.3 Manager Selection Process

Learning Objectives

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

Demonstrate knowledge of the manager selection process and several issues inherent in fund management

Including:

- Understand the fund manager selection process
- Understand how moral hazard, adverse selection, and the holdup problem impact fund management

Keywords

holdup problem	

6.1.4 Screening with Fundamental Questions

Learning Objectives

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

Demonstrate knowledge of how to screen fund management

Including:

- Identify questions regarding the nature of a fund's investment program.
- Identify questions regarding the investment objective of PE funds.
- Identify questions regarding the investment process of PE funds.
- Identify questions regarding the value added by the fund manager of PE funds.

Keywords

fund screening process	**investment process risk**	**information gathering**
information filtering		

6.1.5 Historical Performance Review

Learning Objectives

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

Demonstrate knowledge of historical performance review

Including:

- Identify critical decisions regarding performance review
- Understand implications of relying on past performance
- Discuss the importance of analyzing past assets under management
- Interpret drawdown
- State five classic statistical issues when using past data to predict the future
- Apply statistical systems to understand portfolio risk management systems

Keywords

herd behavior	bias blind spot	expectation bias
gaming		

6.1.6 Manager Selection and Deal Sourcing

Learning Objectives

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

Demonstrate knowledge of manager selection and deal sourcing

Including:

- Determine the wish list of fund characteristics
- Recommend systems to assess a management team's competence
- Understand how to source deals

Keywords

blue-chip management team	established management team	emerging management team
reemerging management team	reactive deal sourcing	

6.1.7 Fund Culture

Learning Objectives

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

Demonstrate knowledge of fund culture

Including:

- Understand the importance of a fund's culture

Keywords

fund culture

6.2.1 Problems Driven by Market Losses

Learning Objectives

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

Demonstrate knowledge of risks driven by market losses

Including:

- Identify the reasons why Amaranth Advisors, LLC collapsed
- Understand the processes that led to the collapse of Long-Term Capital Management
- Identify the reasons why Carlyle Capital Corporation collapsed
- Understand the concept of volatility of volatility derivatives

6.2.2 Problems Driven by Leverage and Behavioral Biases

Learning Objectives

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

Demonstrate knowledge of risks driven by leverage and behavioral biases

Including:

- Evaluate the relationship between declining investment opportunities and leverage
- Describe the link between behavioral biases and risk takin

6.2.3 Trading Technology and Financial Crises

Learning Objectives

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

Demonstrate knowledge of the impact of trading technologies in financial crises

Including:

- Discuss how the unwind hypothesis and crowded trades explain the Quant Meltdown of August 2007.
- Discuss how a circuit breaker can help prevent a flash crash.
- Discuss how technical issues at one large market participant can impact the financial markets.

Keywords

unwind hypothesis	**circuit breaker**	**spoofing**

6.2.4 Failures Driven by Fraud

Learning Objectives

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

Demonstrate knowledge of cases of failures that occurred due to fraud

Including:

- Understand the reasons for the failures of Bayou Management
- Understand the reasons for the failure of Bernie Madoff
- Understand the reasons for the failure of Lancer Group
- Understand the reasons for the failure of the venture capital startup Theranos
- Evaluate the failures in diligence by venture capitalists invested with FTX

Keywords

painting the tape	Ponzi scheme	affinity fraud
window dressing		

6.2.5 Major Lessons from Cases in Tail Events

Learning Objectives

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

Demonstrate knowledge of four major lessons from analysis of fund failures

Including:

Discuss the lessons that emerge from the analysis of various types of hedge fund failures.

6.3.1 Overview of Investment Due Diligence

Learning Objectives

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

Demonstrate knowledge of investment due diligence

Including:

- Describe different approaches to due diligence.
- Describe and compare quantitative due diligence and qualitative due diligence.
- Understand the importance of investment due diligence.
- State internal fund functions.
- Distinguish between investment process and operational due diligence.
- Understand costs and importance of due diligence.
- Identify the role of due diligence checklists and questionnaires.

Keywords

fund due diligence	**desk review**	**business activities**
quantitative due diligence	**qualitative due diligence**	

6.3.2 The Investment Strategy or Mandate

Learning Objectives

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

Demonstrate knowledge of the investment strategy or investment mandate

Including:

- Describe details of investment strategies
- Discuss strategy drift within the investment mandate
- Understand leverage within strategy drift
- Understand how investment markets and securities are related
- Describe the relationship between the due diligence process and competitive advantage
- Identify key persons within investment strategies

Keywords

investment strategy or mandate of a fund	**fund capacity**	

6.3.3 The Investment Implementation Process and Its Risks

Learning Objectives

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

Demonstrate knowledge of investment implementation processes and accompanying risks

Including:

- Discuss how to implement investment strategies
- Interpret risks within investment processes
- Understand how to detect investment process risks

Keywords

investment process	

6.3.4 Asset Custody and Valuation

Learning Objectives

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

Demonstrate knowledge of asset custody and valuation

Including:

- Understand the role of custodians in safeguarding assets
- Describe the role of the current portfolio position in the due diligence process
- Evaluate principles of fund asset valuation
- Discuss conflicts of interest with respect to fund asset valuation
- Identify challenges in listed asset valuation
- Understand the relationship between asset level and fair asset values
- Interpret internal valuation of assets

Keywords

custody	**position-level transparency**	**mark to model**
level 1 assets	**level 2 assets**	**level 3 assets**

6.3.5 Risk Alert's One Advantage and Six Observations on Third-Party Information

Learning Objectives

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

Demonstrate knowledge of risk alert advantages and observations

Including:

- Identify advantages of portfolio information aggregators
- Understand risk alert observations on third party information regarding asset values
- Understand risk alert observations on trends in due diligence

Keywords

portfolio information aggregators (risk aggregators)	**bias ratio**

6.3.6 Portfolio Risk Review

Learning Objectives

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

Demonstrate knowledge of portfolio risk review

Including:

- Understand the role of risk review
- Identify the role of the chief risk officer
- State general questions that must be asked in a risk review
- Identify risks of special concern in the risk review
- Understand the relationship between risk review and leverage
- Understand how leverage magnifies losses and probabilities of various loss levels
- Identify subscription and redemption risks

Keywords

synergistic risk effect	**chief risk officer (CRO)**

6.3.7 Warning Indicators Regarding Investments and Risk Management

Learning Objectives

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

Demonstrate knowledge of warning indicators and awareness signals in investments and risk management

Including:

- Identify warning indicators and awareness signals with respect to investments
- Identify warning indicators and awareness signals with respect to risk management

6.4.1 Operations: Overview, Risks and Remedies

Learning Objectives

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

Demonstrate knowledge of risks and remedies in operations

Including:

- Identify operational errors, agency conflicts, and operational fraud of a fund
- Understand why operational due diligence is driven by operational risk
- List the major components to controlling operational risk
- Understand how investors can mitigate operational risk
- Describe how perverse incentives can motivate the reporting of performance
- Discuss oversight procedures of the trade life cycle
- Explain the role of an SEC risk alert with respect to a fund's investment process

Keywords

operational due diligence (ODD)	**operational fraud**	**rogue trader**

6.4.2 Key Operational Activities

Learning Objectives

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

Demonstrate knowledge of key operational activities and key elements of the ODD process

Including:

- Understand due diligence with respect to the execution of trades
- Understand due diligence with respect to posting of trades
- Understand due diligence with respect to trade allocation
- Understand due diligence with respect to trade reconciliation
- Identify core elements of the ODD process
- Understand explanations for the expanding scope of operational due diligence
- Discuss the use of third-party sources for due diligence review

Keywords

trade execution	**trade blotter**	**posting**
trade allocation	**pro rata allocation**	**reconciliation**
two-way reconciliation	**three-way reconciliation (or triangular reconciliation)**	**trade break**
T+1 basis	**internal settlement**	

6.4.3 Analyzing Fund Cash Management and Movement

Learning Objectives

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

Demonstrate knowledge of cash fund management and movement

Including:

- List the primary purposes of fund cash
- Analyze the use of cash to meet fund expenses
- Analyze the use of cash to facilitate trading
- Evaluate the reasons for analyzing cash to and from investors
- Discuss the role of unencumbered cash

Keywords

subscriptions and redemptions	**unencumbered cash**

6.4.4 Analyzing External Parties and Checking Principals

Learning Objectives

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

Demonstrate knowledge of how to analyze external parties and check principals

Including:

- Understand the role of fund prime brokers
- Analyze the role of fund administrators
- Understand the role of investigative due diligence
- Describe various models for selecting personnel for investigation
- List areas that are commonly included in background investigations
- Understand how to organize and interpret information from investigations
- Understand the process of asset verification

Keywords

fund prime brokers	**valuation agent**	**net asset value (NAV)**
cutting the NAV	**equity ownership model**	**investment decision-making authority model**
risk control model	**asset verification**	

6.4.5 Analyzing Fund Compliance

Learning Objectives

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

Demonstrate knowledge of analysis of fund compliance

Including:

- Understand the importance of personal trading compliance of fund employees
- Identify common compliance risks regarding personal trading
- Discuss compliance risks regarding nonpublic and inside information
- Understand the role of electronic communication monitoring
- Analyze the work of third-party compliance consultants

Keywords

expert networks	**personal account dealing**	**front running**
covered securities	**pre-clearance**	**post-clearance**
restricted list	**blackout periods**	**minimum holding periods**
maximum number of trades	**hardship exemption procedure**	

6.4.6 On-Site Manager Visits, Meta Risks, and IT

Learning Objectives

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

Demonstrate knowledge of processes and role of on-site manager visits as well as meta risks and information technology

Including:

- Understand how to select visit locations
- Explain why desk reviews are not best practice
- Identify the risk alert's three tasks on desk and site review
- Understand the due diligence role played by information technology
- Discuss five due diligence questions that surround information technology
- Define meta risk

Keywords

operational scalability	**meta risks**

6.4.7 Emerging Managers

Learning Objectives

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

Demonstrate knowledge of performing operational due diligence on emerging managers

Including:

- Describe the difficulties an emerging manager may encounter in the operational due diligence process

Keywords

Emerging manager

6.4.8 Funding, Applying, and Concluding ODD

Learning Objectives

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

Demonstrate knowledge of funding, applying, and concluding ODD

Including:

- Contrast approaches to resource allocation for operational due diligence
- Understand how to document the operational due diligence process
- State the relationship between due diligence and the operational decision

Keywords

operational decision	**operational threshold issue**	**operational benchmarking**

6.5.1 Due Diligence Document Collection Process

Learning Objectives

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

Demonstrate knowledge of the document collection process in due diligence

Including:

- Explain asset owners' objectives within allocations

Keywords

operational risk profile

6.5.2 Unlisted Manager-Investor Relationships

Learning Objectives

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

Demonstrate knowledge of unlisted manager-investor relationships

Including:

- Apply the ILPA guiding principles to private fund structures
- Support the use of the ILPA guiding principles in fund management

Keywords

fund governance	**qualified majority**	**fund's board of directors**
LP advisory committee (LPAC)	**audit holdback**	**limited partnership agreement (LPA)**

6.5.3 Structural Review of the Fund and Fund Manager

Learning Objectives

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

Demonstrate knowledge of structural review of funds and fund managers

Including:

- Understand the importance of legal fund structures
- Describe how master-feeder trusts work
- Understand how side pocket arrangements operate
- Discuss the role of the documentation of registrations
- Understand the role of fund manager organization and ownership

Keywords

structural review		

6.5.4 Terms for Liquid Private Funds

Learning Objectives

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

Demonstrate knowledge of terms for liquid and illiquid private funds

Including:

- Understand redemption terms
- Describe potential benefits of lockups
- Understand the relationships between the LPA, fund term, and distributions
- Understand terminations and divorces within funds
- Describe investment limits and legal liability limits
  Understand investor relations

6.5.5 Side Letters to Limited Partnership Agreements

Learning Objectives

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

Demonstrate knowledge of side letters to limited partnership agreements

Including:

- Evaluate the various issues involving side letters

Keywords

most favored nation status	use of name clauses	excuse rights

6.5.6 Private Placement Memorandum (PPM)

Learning Objectives

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

Demonstrate knowledge of private-placement memorandums (PPM)

Including:

- State key functions of the offering memorandum (OM) and PPM
- Understand the function of side letters
- Identify different purposes of legal counsel reviews and ODD document reviews
- Analyze other common private placement memorandum terms

Keywords

The offering memorandum (OM) or private placement memorandum (PPM)	risk assignment	exculpation
indemnification	side letter	

6.5.7 Fund Fees and Expenses

Learning Objectives

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

Demonstrate knowledge of fund fees and expenses

Including:

- Identify the timing of fee collections
- Understand the role of fee offsets
- Understand the contribution of GPs contribution with respect to fund risk taking

Keywords

hurt money

6.5.8 Private Fund Audited Financial Statement Review

Learning Objectives

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

Demonstrate knowledge of private fund audited financial statement reviews

Including:

- Define the role of audited financial statements
- Understand valuation policies

6.5.9 Business Activities, Continuity Planning, Disaster Recovery, and Insurance

Learning Objectives

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

Demonstrate knowledge of business activities, continuity planning, disaster recovery, and insurance

Including:

- Understand the process of business continuity planning and disaster recovery
- Describe the role of information technology in continuity planning and disaster recovery
- Discuss the role of fund insurance in operational due diligence

Keywords

business continuity planning	**disaster recovery (DR)**	**E&O insurance**

Topic 7 Volatility and Complex Strategies

7.1.1 Measures of Volatility

Learning Objectives

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

Demonstrate knowledge of measures of volatility

Including:

- Understand differences between implied volatility and realized volatility
- Identify limitations of realized volatility as a measure of dispersion
- State the properties of realized volatility

Keywords

implied return volatility	**realized return volatility**

7.1.2 Volatility and the Vegas, Gammas, and Thetas of Options

Learning Objectives

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

Demonstrate knowledge of volatility and the vegas, gammas, and thetas of options

Including:

- Describe option vegas
- Interpret the scaling of the vega of an option
- Interpret and apply vega as an option for finite shifts
- Understand how vega shifts as underlying variables change
- Interpret option gammas
- Understand the interrelationships between option vegas, gammas, and thetas

7.1.3 Exposures to Volatility as a Factor

Learning Objectives

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

Demonstrate knowledge of exposures to volatility as a factor

Including:

- Contrast long volatility with short volatility
- Understand distinctions between positive vega and long volatility exposures
- Explain how volatility can be used to hedge risk
- Understand volatility as an unobservable but unique risk factor
- Understand how long volatility carries a negative risk premium
- Explain how short volatility earns a positive risk premium

Keywords

short volatility	long volatility	volatility derivatives
negative volatility risk premium		

7.1.4 Modeling Volatility Processes

Learning Objectives

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

Demonstrate knowledge of modeling volatility processes

Including:

- Understand volatility processes with jump risk

- Construct volatility processes and regime changes
- Discuss reasons why volatility strategies recover
- Identify reasons why volatility mean reversion cannot be arbitraged

Keywords

volatility risk	volatility diffusion risk	volatility jump risk
regime change	mixture model or a regime switching model	volatility clustering

7.1.5 Implied Volatility Structures

Learning Objectives

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

Demonstrate knowledge of implied volatility structures

Including:

- Describe methods of computing implied volatility
- Identify structures regarding implied volatility and moneyness
- Identify an implied volatility surface
- Explain key reasons for implied volatility structures and surfaces
- Discuss reasons for high implied volatility and out-of-the-money puts

Keywords

implied volatility structure	volatility skew	smile or a smirk
options volatility surface		

7.2.1 Common Option Strategies and Their Volatility Exposures

Learning Objectives

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

Demonstrate knowledge of common option strategies and their volatility exposures

Including:

- Understand and apply theta as a measure of time decay in an option
- Describe writing option straddles and strangles as short volatility strategies
- Describe writing option butterflies and condors as short volatility strategies

Keywords

short straddle	short strangle	iron butterfly
iron condor		

7.2.2 Volatility and Delta-Neutral Portfolios with Options

Learning Objectives

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

Demonstrate knowledge of volatility and delta-neutral portfolios with options, and advanced option-based volatility strategies

Including:

- State the general performance drivers of delta-neutral portfolios with options
- Identify the key points that surround delta-neutral option portfolios
- Interpret delta normalization and exposure to volatility
- Describe vertical intra-asset option spreads
- Construct vertical spreads with delta hedging
- Understand horizontal intra-asset (skew) spreads
- Understand inter-asset option spreads

Keywords

vega normalization	vertical spread	ratio spread
horizontal spread	ratio spread	

7.2.3 Variance-Based and Volatility-based Derivative Products

Learning Objectives

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

Demonstrate knowledge on variance-based and volatility-based derivative products

Including:

- Describe derivative strategies that create payoffs driven by realized variance
- Interpret implied volatility indices
- Understand how the Cboe Volatility Index is calculated
- Interpret futures contracts on the Cboe Volatility Index
- Understand how to calculate the hypothetical price of an S&P VIX short-term futures contract
- Describe the process of engineering VIX-related financial derivatives
- Apply the VIX term structure to portfolio insurance

Keywords

Cboe volatility index (VIX)	VIX term structure	S&P 500 Short-Term VIX Futures Index

7.2.4 Correlation Swaps and Dispersion Trades

Learning Objectives

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

Demonstrate knowledge of correlation swaps and dispersion trades

Including:

- Understand and apply the mechanics of a correlation swap
- Model the relationship between correlations, security volatility, and portfolio volatility
- Understand motivations to correlation trading
- Understand the basics of dispersion trades

Keywords

correlation swap

7.2.5 Summary and Common Themes of Volatility, Correlation, and Dispersion Trading

Learning Objectives

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

Demonstrate knowledge of commonalities of volatility, correlation, and dispersion trading

Including:

- Understand the basics of volatility, correlation, and dispersion trading

7.3.1 Uncertainty, Ambiguity, and Opacity

Learning Objectives

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

Demonstrate knowledge of uncertainty, ambiguity, and opacity

Including:

- Define Knightian uncertainty
- Define ambiguity
- Define opacity and understand the theoretical incentive to create complexity

Keywords

Knightian uncertainty	**ambiguity**

7.3.2 Asset and Strategy Complexity

Learning Objectives

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

Demonstrate knowledge of asset and strategy complexities

Including:

- Understand the role of complexity and passive indexation in active management
- Explain complexity crashes
- Describe the complexity risk premium
- Interpret complexity as a return characteristic or factor

Keywords

complexity risk premium	

7.3.3 Cases in Complexity and Perverse Incentives

Learning Objectives

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

Demonstrate knowledge of cases involving complexity and perverse incentives

Including:

- Understand the role played by Treasury STRIPS in the 1980s
- Understand the role and process of collateralized mortgage obligations in the 1990s
- Understand the role and process of residential mortgage-backed securities in the 2000s
- Identify key takeaways from three fixed income cases

Keywords

US Treasury STRIPS

7.3.4 Structured Products, Wrappers, and Motivations

Learning Objectives

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

Demonstrate knowledge of structured products and types of wrappers and tax effects of wrappers

Including:

- Describe equity-linked structured products
- Describe the six types of wrappers
- Describe the tax effects of wrappers
- Calculate the pre-tax and after-tax return of fully taxed investments
- Calculate the after-tax return of tax-deferred wrappers
- Calculate the after-tax return on a wrapper that offers both tax deduction and tax deferral
- Identify investor motivations for including structured products in a portfolio
- Discuss tax-related motivations for investors
- Discuss the motivations of issuers of structured products

Keywords

equity-linked structured products	**wrapper**	**tax deferral**
tax deduction		

7.3.5 Structured Products with Exotic Option Features

Learning Objectives

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

Demonstrate knowledge of structured products with exotic option features

Including:

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

Keywords

exotic option	**structured product without exotic options**	**principal-protected structured product**
simple option	**participation rate**	**cash-and-call strategy**
Asian option	**path-dependent option**	**active option**
barrier option	**knock-in option**	**knock-out option**
spread option	**look-back option**	

7.3.6 The EUSIPA Classification

Learning Objectives

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

Demonstrate knowledge of the EUSIPA classification

Including:

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

Keywords

EUSIPA	**EUSIPA Derivative Map**	**yield enhancement structured products**
capital protection structured products	**participation structured products**	

7.3.7 Global Structured Product Cases

Learning Objectives

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

Demonstrate knowledge of global structured product types and cases

Including:

- Discuss absolute return and principal protected absolute return barrier notes
- Understand the components within a US-based structured product with multiple kinks
- Understand the components within a German-based structured product with leverage
- Understand the components within a Japan-based structured product based on multiple currencies

Keywords

power reverse dual-currency note	**absolute return structured product**	**principal protected absolute return barrier note**

7.3.8 Structured Product Valuation

Learning Objectives

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

Demonstrate knowledge of structured product valuation

Including:

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

Keywords

dynamic hedging	**boundary condition**	**static hedge**
partial differential equation approach (PDE approach)	**payoff diagram shape**	**payoff diagram level**

7.4.1 Traditional View of Currency-Hedging for Cross-Border Real Estate Investing

Learning Objectives

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

Demonstrate knowledge of views regarding currency hedging for cross-border real estate investing

Including:

- Understand the concept of cross-border return and calculate its total return.
- Identify key traditional currency risk assumptions of cross-border investing.
- Calculate the variance of an investor's total return viewed from the home currency.
- Understand and apply the role of the correlation coefficient in the volatility of dollar-based returns.
- Identify the financial instruments commonly used to hedge currency risk.
- Construct a natural hedge and identify its impact on currency risk.
- Explain the relationship between an investor's wealth and risk and currencies.

Keywords

natural hedge	

7.4.2 Fundamentals of Currency Risk and Hedging in Perfect Markets

Learning Objectives

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

Demonstrate knowledge of fundamentals of currency risk and hedging in perfect markets

Including:

- Understand and apply the law of one price
- Discuss currency risk and the law of one price with no currency hedging
- Discuss currency risk and the law of one price with currency hedging
- Evaluate currency risk and currency hedging of fixed income securities

7.4.3 Currency Risk and Hedging of Alternative Investments

Learning Objectives

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

Demonstrate knowledge of currency risk and hedging within alternative investments

Including:

- Define price stickiness and its relationship with asset values and expected future cash flows
- Understand price stickiness and its relationship with currency risk and unlevered corporate assets
- Understand levered assets in currency risk

Keywords

price stickiness

7.4.4 Accessing Foreign Assets with Futures and Quanto Futures

Learning Objectives

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

Demonstrate knowledge of access to foreign assets with futures and quanto futures

Including:

- Define quanto future derivatives
- Understand quanto futures contracts
- Contrast futures-based strategies with direct cash investment in foreign assets

Keywords

quanto derivative	**quanto option**

7.4.5 Overview of International Real Estate investing

Learning Objectives

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

Demonstrate knowledge of international real estate investing

Including:

- Identify characteristics of international real estate markets.
- Discuss transaction costs and taxes in global real estate.
- Identify the factors that affect variation in the median time to sell a real estate property.
- Identify the benefits of international real estate investing.

Keywords

Roundtrip costs

7.4.6 Challenges to International Real Estate Investing

Learning Objectives

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

Demonstrate knowledge of challenges in international real estate investing

Including:

- Identify reasons why agency relationships are important in real estate investing
- Understand relative inefficiencies in global real estate markets
- Understand the role of information asymmetries in real estate investing
- Understand the role of liquidity and transaction costs in real estate investing
- Identify political, economic, and legal risks in international real estate investing

Topic 8 Universal Investment Considerations

8.1.1 The Investment Industry

Learning Objectives

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

Demonstrate knowledge of the purpose, role, and participants of the investment industry.

Including:

- Distinguish between the participants within the investment industry
- Justify the four facets of purpose of the investment industry
- Analyze the current investment industry relative to alternative systems
- Understand the four facets of purpose of the investment industry

Keywords

principal	agent	stakeholder

value chain		

8.1.2 Value Creation and the Investment Industry

Learning Objectives

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

Demonstrate knowledge of the purpose of the investment industry and value creation within the industry.

Including:

- Assess how value is created in the investment industry
- Understand the role of sustainable finance
- Understand the role of capital allocation in the investment industry
- Describe how public and private markets create value
- Describe stewardship with respect to investment industry activity
- Understand different value models

Keywords

sustainability	**capital allocation**	**social-license principle**
stewardship	**triple bottom line**	

8.1.3 Fiduciary Duty and Professionalism

Learning Objectives

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

Demonstrate knowledge of professionalism and fiduciary responsibility.

Including:

- Evaluate the purpose of fiduciary duty and the four areas of fiduciary obligations
- Understand the five values that support a true fiduciary and professional mindset
- Assess the role of culture on industry professionalism
- Understand the challenges that associate with the four areas of fiduciary obligations

Keywords

social license compact

8.1.4 The Client First Mindset

Learning Objectives

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

Demonstrate knowledge of a client-first approach.

Including:

- Discuss the role of trust in client relationships
- Contrast the professional mindset with the characteristics and trademarks of our current system
- Recommend how investors can navigate instances when the "right" choice is not obvious
- Justify the role a professional mindset has in creating value for a client
- Describe the virtuous circle of positive forces with respect to the fiduciary and professional mindset

Keywords

misaligned industry	**professional industry**	**unnecessary industry**

8.2.1 Overview of Financial Market Regulation

Learning Objectives

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

Demonstrate knowledge of financial market regulation

Including:

- Discuss principles of securities economic regulation
- Understand the importance of regulation in some trading strategies

Keywords

qualified opportunity zones		

8.2.2 Regulation of Alternative Investments within the United States

Learning Objectives

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

Demonstrate knowledge of alternative investment regulation in the United States

Including:

- Identify the main regulatory bodies and their jurisdictions
- Identify regulatory frameworks and statutes within the United States
- Understand regulation of private funds and why one must register as an investment advisor

- Identify investment advisor obligations within private fund regulations
- Understand the process of hedge fund registration in the United States
- Understand the process of registering both private and public securities and how the Securities Act affects this process
- Understand the exemptions from registration under the Investment Company Act
- Identify the role of the chief compliance officer and compliance culture
- Understand the importance of marketing material review
- Identify the various SEC Exams
- Identify reporting requirements

Keywords

investment adviser	**principles-based disclosure requirements**	**blue sky laws**
anti-fraud prohibitions	**illegal insider trading**	**illegal insider trading**
cybersecurity	**initial coin offerings (ICOs)**	**accredited investors**
Chief Compliance Officer (CCO)	**qualified purchaser**	**code of ethics**
access persons	**cause exams**	**sweep exams**

8.2.3 Alternative Investment Regulation in Europe

Learning Objectives

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

Demonstrate knowledge of alternative investment regulation in Europe

Including:

- Identify the European regulatory bodies and their jurisdictions
- Understand regulatory frameworks within Europe
- Identify requirements regarding registration and exemptions from those requirements within Europe
- Understand disclosure requirements around the marketing of investment products
- Identify formal requirements in risk management
- Identify requirements around the reporting of regulations in Europe
- Analyze the legal structures within European regulatory frameworks
- Understand how European regulations are enforced
- Understand how non-EU managers may operate in Europe

Keywords

competent authority	**home member state**	**host state**
Undertakings for Collective Investments in Transferable Securities (UCITS)	**Alternative Investment Fund Managers Directive (AIFMD)**	**national private placement rules**

marketing passport	**asset stripping rules**	

8.2.4 Alt Investment Regulation in Asia

Learning Objectives

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

Demonstrate knowledge of alternative investment regulation in Asia

Including:

- Identify regulatory requirements and frameworks within Hong Kong.
- Identify regulatory requirements and frameworks within Singapore.
- Identify regulatory requirements and frameworks within South Korea.
- Identify regulatory requirements and frameworks within Japan.
- Identify regulatory requirements and frameworks within Australia.
- Identify regulatory requirements and frameworks within India.
- Identify regulatory requirements and frameworks within China

Keywords

Securities and Futures Ordinance (SFO)	**Financial Instruments and Exchange Act (FIEA)**	**Securities and Futures Act (SFA)**
Financial Investment Services and Capital Markets Act (FSCMA)	**The Act on Investment Trust and Investment Corporation (ITIC)**	**Variable Capital Company (VCC)**
Australian Securities and Investments Commission Act 2001 (ASIC Act)	**Alternative Investment Funds Regulations 2012 (AIF regulations)**	**Securities Investment Fund Law**

8.3.1 Geopolitical Systems and Investing

Learning Objectives

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

Demonstrate knowledge of the various geopolitical paradigms embedded in an investment framework

Including:

- Evaluate the role of geopolitical beta in long-term investments
- Contrast the three potential starting systems of geopolitics
- Contrast the three potential starting systems for politics

Keywords

geopolitical beta	hegemon / unipolar	laissez-faire
bipolar	Washington Consensus	dirigisme
multipolar distribution	populism	

8.3.2 Geopolitical Framework for Private Markets

Learning Objectives

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

Demonstrate knowledge of role of geopolitics in investing while applying a constraint-based framework

Including:

- Contrast the impact of geopolitical risk on public markets and private markets
- Explain the constraint-based framework for geopolitical analysis
- Identify the three pillars of the constraint-based framework
- Distinguish between preferences and constraints
- Identify material constraints
- Understand the geopolitical risk premium and the impact on valuation and returns

Keywords

diagnosticity	fundamental attribution error

8.3.3 Geopolitical Beta in Private Markets

Learning Objectives

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

Demonstrate knowledge of the impact of geopolitics on private market valuations and return expectations.

Including:

- Discuss the challenges in generating geopolitical beta
- State the three mistakes investors make when analyzing geopolitical events
- Distinguish between geopolitical beta and geopolitical alpha

Keywords

linear extrapolation

8.3.4 Applying the 3x3 Framework

Learning Objectives

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

Demonstrate knowledge of applying the 3x3 framework within an investment context.

Including:

- Construct a 3x3 diagram of the geopolitical and political future

8.4.1 Background on Sustainability and Alternative Investing

Learning Objectives

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

Demonstrate knowledge of sustainability in alternative investments

Including:

- Understand the growth of sustainability principles in alternative assets
- Understand how sustainability principles are incorporated by institutional investors
  Identify and explain challenges in incorporating sustainability principles into the investment decision

8.4.2 Sustainability and Real Assets: Natural Resources

Learning Objectives

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

Demonstrate knowledge of how sustainability impacts natural resources as a real asset

Including:

- Understand how environmental issues can impact investments in natural resources
- Understand how social issues can impact investments in natural resources
- Understand how governance issues can impact investments in natural resources

8.4.3 Sustainability and Real Assets: Commodities

Learning Objectives

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

Demonstrate knowledge of how sustainability impacts commodities as a real asset

Including:

- Explain the role of speculators and speculation in pricing commodity derivatives

- Understand the implication of changes in volatility on commodity speculation
- Understand how sustainability factors can apply to direct investment in physical commodities

8.4.4 Sustainability and Real Assets: Real Estate

Learning Objectives

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

Demonstrate knowledge of how sustainability impacts real estate as a real asset

Including:

- Identify the impacts sustainability considerations can have on real estate development
- Describe how sustainability considerations can impact the use of real estate
- Explain how issues in sustainability can apply to the treatment of tenants, workers, and communities
- Describe the influence of sustainability principles in recovery and disposal of real estate
- Identify sustainability issues in refurbishment and retrofitting
- Understand the processes of waste management, resource conservation, and recycling in relation to the demolition of real estate assets
- Understand the process of land recovery and rehabilitation in real estate

Keywords

stranded assets

8.4.5 Sustainability and Hedge Funds

Learning Objectives

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

Demonstrate knowledge of how sustainability impacts hedge funds

Including:

- Describe how sustainability principles guide hedge fund investment strategies
- Describe how sustainability principles can guide hedge fund governance
- Explain the relationship between sustainability principles and hedge fund transparency
- Demonstrate knowledge of how sustainability interacts with hedge fund investment techniques and instruments
- Understand the relationship between hedge fund strategies and underlying investments
- Describe how hedge fund strategies are impacted by activism
- Describe how hedge fund strategies are impacted by avoidance

Keywords

Open Protocol

8.4.6 Sustainability and Private Equity

Learning Objectives

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

Demonstrate knowledge of how sustainability impacts private equity

Including:

- Explain how partnership organizations can support sustainability, including within the GP-LP relationship
- Describe how the private equity investment process can include sustainability principles
- Understand the monitoring process and how it applies to sustainability

8.5.1 A Closer Look at Sustainability

Learning Objectives

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

Demonstrate knowledge of the background of sustainability

Including:

- Describe the history of sustainability
- Explain the Global Reporting Initiative (GRI) Standards
- Understand the relationship between social responsibility and evidence of stakeholder wealth within sustainability

8.5.2 Sustainability Ratings and Scores

Learning Objectives

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

Demonstrate knowledge of how sustainability is rated and scored within an entity's operating procedures

Including:

- Discuss sustainability ratings and scores as part of operating procedures

8.5.3 Sustainability Materiality and Disclosure

Learning Objectives

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

Demonstrate knowledge of sustainability materiality and disclosure

Including:

- Understand how the Global Reporting Initiative (GRI) governs sustainability materiality and sustainability disclosure
- Explain KPMG's framework for materiality assessments
- Interpret the sustainability materiality map
- Discuss the measurement of sustainability materiality
- State the three phases of the impact of adverse Sustainability events

Keywords

SASB Materiality Map	The Global Reporting Initiative (GRI)	G4 Materiality Principle

8.5.4 The United Nations Role in Sustainability Issues

Learning Objectives

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

Demonstrate knowledge of the role the United Nations (UN) has in sustainability issues

Including:

- Identify the Six Principles for Responsible Investment (PRI)
- Explain Sustainable Development Goals (SDGs)

Keywords

Principles for Responsible Investment (PRI)

8.5.5 Sustainability Fiduciary Responsibilities and Regulation

Learning Objectives

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

Demonstrate knowledge of fiduciary responsibilities and regulation within sustainability

Including:

- Discuss fiduciary responsibilities within the US as they relate to sustainability
- Discuss fiduciary responsibilities within Europe as they relate to sustainability
- Discuss fiduciary responsibilities within Asia as they relate to sustainability
- Discuss how asset managers approach sustainability compliance and risk management

Keywords

greenwashing

8.5.6 Methods of Sustainability Investing

Learning Objectives

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

Demonstrate knowledge of methods of sustainability investing

Including:

- Distinguish between negative and positive screening
- Discuss engagement and proxy voting strategies
- Describe impact investing in the context of their categories, the steps of implementation, and illiquid investments

Keywords

negative or exclusionary screening	sin stocks	positive screening
engagement strategy	proxy voting	impact investing
mission related investments (MRI)	program related investments (PRI)	enviropreneurship
impact first	finance first	impact alpha

8.5.7 Market-Based Methods of Addressing Sustainability Issues

Learning Objectives

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

Demonstrate knowledge of market-based methods to address sustainability issues

Including:

- Understand the background of externalities and markets
- Interpret the Coase Theorem

Keywords

negative externalities	tragedy of the commons	Coase theorem
cap and trade		

8.5.8 Sustainability and Special Investment Consideration

Learning Objectives

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

Demonstrate knowledge of special investment considerations as they apply to sustainability

Including:

- Understand special consideration, cash flows, returns, and risk
- Describe the case for special consideration of sustainability issues
- Describe the case against special consideration of sustainability issues

Topic 9 Emerging Topics

You may access the Emerging Topics articles at https://caia.org/curriculum-study-tools

(CAIA website log in required) under the Level II materials section.

9.1.1 Decentralized Finance

"Decentralized Finance: On Blockchain- and Smart Contract-Based Financial Markets." Fabian Schär. Economic Research, Federal Reserve Bank of St. Louis. 2021.

Learning Objectives

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

Demonstrate knowledge of decentralized finance (DeFi)

Including:

- Define the building blocks of DeFi, including settlement, asset, protocol, application, and aggregation layers

Demonstrate knowledge of asset tokenization

Including:

- Define and discuss the risks of asset tokenization, including the use of off-chain collateral, on-chain collateral, and no collateral
- Explain the use of stablecoins in the DeFi system

Demonstrate knowledge of decentralized exchange protocols

Including:

- Contrast decentralized and centralized exchanges including advantages and disadvantages

- Explain decentralized exchange protocols and liquidity systems, such as decentralized order book exchanges, constant function market maker, smart contract-based reserve aggregation, and peer-to-peer protocols

Demonstrate knowledge of decentralized lending platforms

Including:

- Discuss collateralized debt positions and collateralized debt markets

Demonstrate knowledge of decentralized derivatives

Including:

- Explain asset-based and event-based derivative tokens

Demonstrate knowledge of the opportunities and risks of the DeFi ecosystem

Including:

- List and discuss the four opportunities and the six risks

Keywords

decentralized finance	**smart contracts**	**stablecoins**
on-chain collateral	**off-chain collateral**	**decentralized exchange**
tokenization		

9.1.2 Web 3.0 Tokenization

Web 3.0 Tokenization and Decentralized Finance (DeFi) Philip Treleaven, et al

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4037471

Learning Objectives

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

Demonstrate knowledge of tokenization and disintermediation of finance

Including:

- Describe Web3.0
- Understand Decentralized Finance (DeFi)
- Explain Tokenization
- Distinguish between the digital economy and traditional economy
- Contrast fiat currencies, cryptocurrencies, and blockchain tokens
- Distinguish between type of blockchain tokens
- Understand the various Web 3.0 technologies
- Understand the DeFi technology stack

- Contrast electronic trading with tokenized trading
- Evaluate Venture Capital tokenization
- List the risks of DeFi
- Discuss the challenges regulators face with new FinTech innovations

Keywords

Web 3.0	**decentralized Finance**	**tokenization**
composability	**initial coin offering**	**security token offering**
utility token offering		

9.1.3 From ELIZA to ChatGPT

Lo, Andrew W., and Manish Singh (2023), "From ELIZA to ChatGPT: The Evolution of NLP and Financial Applications," Journal of Portfolio Management, June 2023

Please note, candidates will not be explicitly tested on the material in the appendix section titled "Complete ChatGPT Interaction."

Learning Objectives

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

Demonstrate knowledge of natural language processing (NLP) and artificial intelligence (AI)

Including:

- Construct a timeline detailing the evolution of NLPs based on model complexity
- Identify key milestones and advancements in NLP
- Identify challenges and limitations associated with different generations of NLP models
- Understand the different steps in the pipeline of a large language model
- Contrast ChatGPT from other NLP models
- Evaluate the limitations of ChatGPT and the implications they have in real-world applications

Demonstrate knowledge of applications of NLP/AI in the Finance Industry

- *Including:*
- Apply NLP models to risk management
- Describe how NLP models can be used in Impact Investing
- Justify the use of NLP models by impact investors given the carbon footprint of these models
- Identify the uses of NLP models in Asset Management
- Evaluate the potential limitations of NLP in financial applications

Keywords

natural language processing	**deep learning**	**machine learning**
hallucination		

9.1.4 Assessing Long-Term Investor Performance

"Assessing Long-Term Investor Performance: Principles, Policies and Metrics," Gordon L. Clark and Ashby Monk, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3321963

Learning Objectives

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

Demonstrate knowledge of long-term investors' operating models

Including:

- Explain the three main advantages long-term investors have relative to other investors
- Discuss the three environmental enablers (intangible advantages) of long-term investors

Demonstrate knowledge of the measurements and metrics used to assess the effectiveness of the long-term investors' process

Including:

- Describe the three "intermediate" outputs LTI's can use to measure organizational performance
- Explain how LTI's measure environmental enablers
- Explain how LTI's measure production inputs
- Explain how LTI's measure intermediate outputs
- Explain how LTI's measure investment results
- Summarize the simple model of production used to quantitatively measure investment activities of long-term investors
- Identify the challenges of using traditional measurements of long-term success (i.e., quarterly returns)

Keywords

knowledge management	**environmental enablers**	**measurements**
commitment	**production inputs**	**long-term investors**
capital leverage	**intermediate outputs metrics**	**time horizon**
board engagement	**organizational ambidexterity**	**idiosyncratic advantages**
culture	**governance**	

9.1.5 Value Creation in Private Equity

European Bank for Reconstruction and Developmenthttps://www.ebrd.com/publications/working-papers/value-creation-in-private-equity

Learning Objectives

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

Demonstrate knowledge of the relationship between Private Equity driven operational changes and investors returns

Including:

- Explain private equity value creation plans (VCPs)
- Distinguish between operational improvements, top-line growth, governance engineering, financial engineering, and cash management
- Discuss the variability of VCPs across deal type, fund ownership, growth strategy, and geographic focus
- Discuss the relationship between action items and type of deal
- Understand the factors influencing the likelihood that a PE firm successfully implements an action item
- Determine which VCP combinations best predict higher returns and lower returns than average
- Contrast predicted returns based on planned strategies versus achieved strategies
- Evaluate the impact single strategies have on return outcomes
- Assess the four company-level changes that correlate significantly with higher investor returns

Keywords

value creation plan	**top-line growth**	**governance engineering**
operating partners	**operational improvements**	**cash management**
financial engineering		

9.1.6 Managing Liquidity for Capital Calls

Cash for Calls: A Quantitative Approach to Managing Liquidity for Capital Calls

PIMCO

https://jai.pm-research.com/content/early/2022/09/01/jai.2022.1.169

Learning Objectives

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

Demonstrate knowledge of liquidity management challenges facing Limited Partners

Including:

- Assess the balance between risk and return of uncalled capital and the uncertain timing of future calls
- Evaluate the decision by an LP to hold unfunded capital commitments in cash equivalents or money market investments
- Discuss the impact of over-committing to private assets
- Analyze capital call risk
- Assess the strategy of investing uncalled capital in public market equivalent assets
- Understand the impact drawdowns have on shortfall risk

- Apply the liquidity tiering framework for an investor in private assets
- Evaluate the four liquidity management strategies

Keywords

liquidity tiering	**expected shortfall**

9.1.7 Takahashi Alexander Revisited

Bella Private Markets, "Takahashi Alexander Revisited." February 2024

Learning Objectives

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

Demonstrate knowledge of Private Equity Cash Flow Modeling

Including:

- Summarize the challenges in developing return expectations for Private Equity funds
- Identify the inputs for the original Takahashi-Alexander cash flow forecasting model
- Assess the limitations of the original Takahashi-Alexander cash flow forecasting model
- Support the design of the Historical Simulation cash flow forecasting model
- Summarize the forecasting accuracy of the Historical Simulation model relative to the Takahashi-Alexander model
- Recommend use cases for the Historical Simulation cash flow forecasting model

Keywords

bow factor	**cash drag**

9.1.8 An Introduction to Portfolio Rebalancing Strategies

"An Introduction to Portfolio Rebalancing Strategies," Hossein Kazemi, 2022.

Learning Objectives

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

Demonstrate knowledge of dynamic trading strategies

Including:

- Determine the portfolio's asset values after a given change in value of a liquid risk asset, using dynamic trading strategies (i.e., buy-and-hold, constant mix, constant-proportion portfolio insurance, and option-based portfolio insurance)
- Compare the payoff, exposure diagrams, and risk tolerance of the buy-and-hold, constant mix, constant-proportion portfolio insurance, and option-based portfolio insurance strategies

Demonstrate knowledge of the payoff curves related to dynamic trading strategies

Including:

- Describe the expected performance and cost of implementing strategies with concave payoff curves relative to those with convex payoff curves under various market situations (i.e., trending markets and flat markets)

Demonstrate knowledge of dynamic strategies with illiquid assets

Including:

- Explain how dynamic trading strategies are adapted for illiquid portfolios
- Determine the portfolio's asset values after a given change in value of an illiquid risk asset, using dynamic trading strategies and futures

Keywords

buy-and-hold	**multiplier**	**constant mix**
concave payoff curves	**constant-proportion portfolio insurance**	**stop-loss**
option-based portfolio insurance	**option replication**	**convex payoff curves**
contrarian strategy	**momentum strategy**	**cushion**