2025 CAIA®
Exam Prep

SchweserNotes™
Institutional Asset Owners, Asset Allocation, and Risk Management

Level II Book 1

KAPLAN SCHWESER

Kaplan Schweser's Path to Success

CAIA® Level II Exam

Welcome

As the head of Advanced Designations at Kaplan Schweser, I am pleased to have the opportunity to help you prepare for the CAIA exam. Kaplan Schweser has decades of experience in delivering the most effective CAIA exam prep products in the market and I know you will find them to be invaluable in your studies.

Our products are designed to be an integrated study solution across print and digital media to provide you the best learning experience, whether you are studying with a physical book, online, or on your mobile device.

Our core product, the SchweserNotes™, addresses all Topic Areas, Readings, and Learning Objectives in the CAIA curriculum. The SchweserNotes are written to clearly and succinctly address the content of each Learning Objective, which form the basis for all exam questions. Our Mock Exams and QuickSheet will help you in the later stages of your study preparation by helping you recall and retain information of important concepts.

All purchasers of the SchweserNotes receive online access to the Kaplan Schweser online platform (our learning management system or LMS) at www.Schweser.com. In the LMS, you will see a dashboard that tracks your overall progress and performance and also includes an Activity Feed, which provides structure and organization to the tasks required to prepare for the CAIA exam. You also have access to the online and eBook versions of the SchweserNotes so that you always have easy access to the readings. There are Reading Quiz questions at the end of each reading. I strongly encourage you to enter your Reading Quiz answers online and use the dashboard to track your progress and stay motivated.

Again, thank you for trusting Kaplan Schweser with your CAIA exam preparation. We're here to help you throughout your journey to become a CAIA charterholder.

Regards,

Derek Burkett

Derek Burkett, CFA, FRM, CAIA
Vice President (Advanced Designations)

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Book 1: Institutional Asset Owners, Asset Allocation, and Risk Management

SchweserNotes™ 2025

CAIA Level II

SCHWESERNOTES™ 2025 CAIA® LEVEL II BOOK 1: INSTITUTIONAL ASSET OWNERS, ASSET ALLOCATION, AND RISK MANAGEMENT

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WELCOME TO THE 2025 SCHWESERNOTES™

Thank you for trusting Kaplan Schweser to help you reach your career and educational goals. We are very pleased to be able to help you prepare for the CAIA Level II exam. In this introduction, I want to explain the resources included with the SchweserNotes, suggest how you can best use Kaplan Schweser materials to prepare for the exam, and direct you toward other educational resources you will find helpful as you study for the exam.

SchweserNotes

The SchweserNotes consists of three volumes that include complete coverage of all CAIA assigned readings and learning objectives (LOs) as well as reading quizzes (multiple-choice and/or constructed response [essay-type] questions for every reading) to help you master the material and check your retention of key concepts.

Practice Questions

To retain the material, it is important to quiz yourself often. We offer an online version of the SchweserPro™ QBank, which contains hundreds of Level II practice questions and explanations. We also offer Topic Quizzes online to further help you retain and apply what you have learned.

OnDemand Class

Our OnDemand Class provides comprehensive online instruction of every reading in the CAIA curriculum. This video lecture series brings the personal attention of a classroom into your home or office with approximately 30 hours of instruction. The class offers in-depth coverage of difficult concepts as well as a discussion of example questions. All videos are available for viewing at any time throughout the exam season. Candidates enrolled in the OnDemand Class also have the ability to email questions to the instructor at any time.

Mock Exams

Schweser offers four full 4-hour practice exams. These online exams are important tools for gaining the speed and skills you will need to pass the exam. The Mock Exams contain answers with full explanations for self-grading and evaluation.

Late-Season Review

Late-season review and exam practice can make all the difference. Our OnDemand Review Package helps you evaluate your exam readiness with products specifically designed for late-season studying. This study package includes the OnDemand Review Workshop (8-hour archived online workshop covering essential curriculum topics) and Schweser's Secret Sauce® (concise summary of the CAIA curriculum).

Level II Exam Weightings

When preparing for the exam, be familiar with the weights assigned to each topic area within the curriculum. The Level II exam weights by question format are as follows:

Book	Topic Area	Multiple Choice Exam Weight	Essay Question Exam Weight
1	Institutional Asset Owners	8%–12%	0%–10%
1	Asset Allocation	8%–12%	0%–10%
1	Risk and Risk Management	8%–12%	0%–10%
2	Methods and Models	8%–12%	0%–10%
2	Accessing Alternative Investments	8%–12%	0%–10%
2	Due Diligence and Selecting Managers	8%–12%	0%–10%
3	Volatility and Complex Strategies	8%–12%	0%–10%
3	Universal Investment Considerations	0%	10%
3	Emerging Topics	0%	10%
	Total	**70%**	**30%**

How to Succeed

The CAIA Level II exam is a formidable challenge, and you must devote considerable time and effort to be properly prepared. There are no shortcuts! You must learn the material, know the terminology and techniques, understand the concepts, and be able to answer 100 multiple-choice and 3 multi-part constructed-response questions quickly and (at least 70%) correctly. A good estimate of the study time required is 250–300 hours on average, but some candidates will need more or less time, depending on their individual backgrounds and experience.

Expect CAIA Association to test your knowledge in a way that will reveal how well you know the Level II curriculum. You should begin studying early and stick to your study plan. You should first read the SchweserNotes and complete the practice questions for each reading. After completing each book, you should answer the provided topic quiz questions to understand how concepts may be tested on the exam.

It is recommended that you finish your initial study of the entire curriculum at least two weeks (earlier if possible) prior to your exam window to allow sufficient time for practice and targeted review. During this period, you should utilize all of your Schweser Mock Exams. This final review period is when you will get a clear indication of how effective your study efforts have been, and which readings require significant additional review. Answering exam-like questions across all readings and improving your exam time management skills will be important determinants of your success on exam day.

Best regards,

Eric Smith

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Director, Advanced Designations
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Readings and Learning Objectives

TOPIC 1

CAIA Association. *CAIA Curriculum Level II Volume I*. Self-published, CAIA Association, 2024.

Reading 1.1: Types of Asset Owners and the Investment Policy Statement

1.1.1: 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.

1.1.2: 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: 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.

1.1.4: 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.

1.1.5: 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: 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.

Reading 1.2: Foundations and the Endowment Model

1.2.1: Demonstrate knowledge of foundations and endowments.
Including:
- Contrast the differences between foundations and endowments.

1.2.2: 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.

1.2.3: 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.

1.2.4: 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.

1.2.5: 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.

1.2.6: Demonstrate knowledge of tactical asset allocation and liquidity rebalancing.
Including:
- Understand the relationship between tactical asset allocation and liquidity rebalancing.

1.2.7: Demonstrate knowledge of tail risk.
Including:
- Discuss tail risk and its implications in endowments.

Reading 1.3: Pension Fund Portfolio Management

1.3.1: 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.

1.3.2: 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.

1.3.3: 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.

1.3.4: Demonstrate knowledge of governmental social security plans.
Including:

- Identify the background and purpose of governmental social security plans.

1.3.5: 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.

1.3.6: 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.

Reading 1.4: Sovereign Wealth Funds

1.4.1: 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.

1.4.2: 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.

1.4.3: 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.

1.4.4: 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.

1.4.5: 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).

Reading 1.5: Family Offices and the Family Office Model

1.5.1: 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.

1.5.2: 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: 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.

1.5.4: Demonstrate knowledge of the macroeconomic exposures of family offices.
Including:

- Discuss how macroeconomic factors affect family office investment decisions.

1.5.5: 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.

1.5.6: 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.

1.5.7: 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.

1.5.8: Demonstrate knowledge of charity and philanthropy.
Including:

- Distinguish the primary characteristics of charity and philanthropy.

1.5.9: 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.

TOPIC 2

CAIA Association. *CAIA Curriculum Level II Volume I*. Self-published, CAIA Association, 2024.

Reading 2.1: Asset Allocation Processes and the Mean-Variance Model

2.1.1: 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.

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

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

2.1.4: 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: Demonstrate knowledge of adjustments of the mean-variance approach for illiquidity and factor exposure.

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.

2.1.6: 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.

Reading 2.2: Total Portfolio Approach

2.2.1: 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: Demonstrate knowledge of the core dimensions of the 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 of adopting TPA.
- Contrast TPA with traditional investment models (e.g., SAA).

2.2.3: Demonstrate knowledge of the role of governance in the total portfolio approach.

Including:

- Discuss the impact of the TPA governance model.

2.2.4: Demonstrate knowledge of the role of factors in the 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.

2.2.5: Demonstrate knowledge of the role of 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.
- Understand how to implement a competition for capital framework.
- Explain the challenges associated with a competition for capital approach.

2.2.6: Demonstrate knowledge of the role of culture in the total portfolio approach.

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: Demonstrate knowledge of implementing the total portfolio approach.
Including:

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

Reading 2.3: Other Asset Allocation Approaches

2.3.1: Demonstrate knowledge of the core-satellite approach.
Including:

- Apply the core-satellite approach.

2.3.2: 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.

2.3.3: Demonstrate knowledge of risk budgeting.
Including:

- Identify specifications in risk budgeting.
- Define risk in risk budgeting as well as risk buckets.
- Apply additional filters to risk budgeting including an objective function, correlations, and expected returns.

2.3.4: 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: 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.

2.3.6: 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.

Reading 2.4: Active Management

2.4.1: Demonstrate knowledge of tactical asset allocation.
Including:

- Understand tactical asset allocation and its various applications.

2.4.2: Demonstrate knowledge of cash commitments and illiquidity.
Including:

- Understand the costs of excess illiquidity.
- Identify the costs of illiquidity.
- Define 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.

2.4.3: 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.

2.4.4: 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: 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 using SAA models.
- Apply conditional analyses using TAA models.
- Describe technical analysis underlying TAA models.

2.4.6: Demonstrate knowledge of adjusting exposures to illiquid partnerships.
Including:

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

2.4.7: Demonstrate knowledge of 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.

2.4.8: 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.
- Assess the risks of continuation funds.

TOPIC 3

2024.

Reading 3.1: Hedging, Rebalancing, and Monitoring

3.1.1: 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: 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.

3.1.3: 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: 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: 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.

3.1.6: 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.

3.1.7: 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.

Reading 3.2: Benchmarking and Performance Attribution

3.2.1: 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: 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.
- Assess the sources of transitional alpha emanating from the global financial crisis.

3.2.3: 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.

3.2.4: 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: 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.

3.2.6: 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: 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: 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.

Reading 3.3: Applied Benchmarking

3.3.1: 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 indices.
- Contrast the three generations of commodity indices.

3.3.2: 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: 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 the KS-PME for a PE fund.
- Discuss extensions to the PME method and other metrics.

3.3.4: Demonstrate knowledge of peer group returns as benchmarks.
Including:

- Understand the peer group method of benchmarking PE fund performance.

3.3.5: 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.

Reading 3.4: Liquidity and Funding Risks

3.4.1: 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 clearinghouses.
- Measure capital at risk for managed futures.

3.4.2: 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 weighting.
- Calculate confidence intervals with parametric VaR.

3.4.3: 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.

3.4.4: 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: 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.

3.4.6: 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.

3.4.7: 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.

Reading 3.5: Risk Measurement, Risk Management, and Risk Systems

3.5.1: Demonstrate knowledge of risk measurement and aggregation.
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.

3.5.2: 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: 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: 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: 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: 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: Demonstrate knowledge of risk management structures and their processes.

Including:

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

The following is a review of the Institutional Asset Owners principles designed to address the learning objectives set forth by CAIA Association®. Cross-reference to CAIA Association Reading 1.1.

READING 1.1

TYPES OF ASSET OWNERS AND THE INVESTMENT POLICY STATEMENT

Topic 1

EXAM FOCUS

This reading is a general overview of the major institutional investors—endowments, foundations, sovereign wealth funds, and family offices. Subsequent readings will examine each of those investors in much greater detail. This reading also develops the concept of strategic asset allocation within the investment policy statement (IPS). It culminates in a detailed account of the IPS, particularly the objectives and constraints. For the exam, pay attention to the fundamental concepts presented here, as they will be pervasive in the next four readings.

INSTITUTIONAL INVESTORS

LO 1.1.1: 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.**

Endowments are set up by nonprofit organizations for the purpose of raising funds to support specific activities. Consider a university endowment, which is the most common form. Here, donors such as alumni would contribute to the endowment fund, and the fund would use the cash to finance day-to-day activities or special projects (e.g., building a new library).

Foundations are similar to endowments from an operational perspective (e.g., provide scholarships), but they differ in that foundations must spend a minimum amount of their assets on an annual basis in order to maintain their tax-advantaged status in countries such as the United States.

Pension Funds

Pension funds are established by a plan sponsor to provide retirement income for individuals, including employees of an organization and citizens of a country. The four types of pension funds are as follows:

- **Public pension funds**
  - These funds are operated by national governments with the intention to provide retirement income to individuals (e.g., Social Security).
  - They are very large funds with long time horizons, which opens up a wide range of investment vehicles, including alternative investments.
- Private defined benefit (DB) funds
  - Pension benefits to employees are known (or defined) and computed on the basis of factors such as salary and number of years of service.
  - Benefits may be indexed for inflation and may allow for payments to be made to the surviving spouse and/or dependents.
  - DB funds are generally large but smaller in scope and shorter in time horizon than national pension funds; alternative investments are likely.
- Private defined contribution (DC) funds
  - Contributions to the plan by the sponsor for the beneficiaries are known (or defined); each beneficiary has an account within the plan.
  - The sponsor determines the range of investments available and then the beneficiary decides how much to allocate to each investment.
  - These funds are smaller in scope than DB and national plans, so the range of investments is narrower and includes fewer alternative investments; real estate and more liquid alternative investments are most common.
- **Individually managed retirement accounts**
  - This is essentially a savings plan for one person with the employee fully controlling how the funds are invested.
  - Some tax benefits are available, which restricts the range of permissible investments and often excludes private alternative investments.

Sovereign Wealth Funds (SWFs)

SWFs are used by national governments to maintain intergenerational equity—a portion of current funds generated in the country are taken from the current generation and set aside for the benefit of subsequent generations.

SWFs are similar to national pension funds in terms of size and investment horizon. They often invest some of their assets outside of the country, financed sometimes by available foreign currency reserves. Given that SWFs are managed nationally, there may be some asset class investment restrictions imposed.

Family Offices

A family office is essentially a firm that manages the investment assets of one client (i.e., a very wealthy individual or family). The source of funds for a family office may be from entrepreneurship or from *old money* (inherited funds from one or two prior generations). Funds could be used to support the family's current living needs, provide funds for future generations, make charitable donations, et cetera. Time horizons are generally long and the scope of investments includes alternative investments.

RISK AND RETURN WITHIN STRATEGIC ASSET ALLOCATION (SAA)

LO 1.1.2: 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.**

SAA takes a long-term perspective in optimizing both return and risk. Once SAA is established, tactical asset allocation (TAA) can build on SAA. Many studies suggest that asset allocation decisions can be attributed to the majority of a portfolio's returns. In that regard, there is diversification in that the performance of the different asset classes in different economic situations helps to dampen any potential losses.

SAA Based on Observation and Reasoning

As a starting point, the idea is to take past risk and return observations and assume that under similar future economic conditions, the same observations will persist and can be projected in the future. However, any known or expected long-term changes would require adjustments to the projections.

Macroeconomic analysis is used to determine long-term risk and return for various asset classes. Expected return is calculated as follows:

$$\text{expected return} = \text{short-term real riskless rate} + \text{expected inflation} + \text{risk premium}$$

Additional considerations for the three components of expected return are as follows:

Short-term real riskless rate:

- Stable, minimum 0%
- Lower than real growth rate

Expected inflation:

- Much less stable given its dependence on central bank policies and long-term growth

Risk premium per asset class:

- Could assume historical amounts will continue in the future if past estimates of volatilities, correlations, and risk exposures are unchanged

Alternative Assets and Return Estimation Challenges

The following are three key reasons for estimation challenges:

- Despite the longer history for classes such as commodities and real estate, there is a much shorter history for classes such as private equity and hedge funds.
- Alpha may have accounted for a large portion of past returns, but with increased participation in alternative assets by investors, the amount of alpha will diminish going forward.
- It appears likely that new alternative asset classes will be developed in the future, which obviously have no historical track record.

For some alternative investments, due to lack of information, it is impossible to accurately estimate risk premiums and correlations between asset classes because significant (and possibly inaccurate) assumptions are made. Other times, there may not be any availability of a specific alternative asset when an asset allocation is being determined for a given portfolio. Therefore, a simplified process that approximates the ideal optimization process needs to be used to build portfolios.

Placing Caps and Floors on Asset Allocations

The caps and floors will vary among investors and can start at about 5% and exceed 30% with the more ambitious and risk-tolerant ones. Allocation percentages consider the following.

Absolute Allocation Size

Outperformance requires a devoted alternative assets investment team, which is not possible from a cost-benefit perspective if the allocation and/or returns are insufficient. However, if the allocation is excessive, then finding enough suitable alternative investments may be problematic; suboptimal performance may occur if forced to choose less attractive alternative investments.

Relative Allocation Size

Allocation size in relation to portfolio size is important. If allocation size is too low, there will be an insignificant impact on portfolio returns. If allocation size is too high, concentration risk (and therefore, lack of diversification) becomes a problem.

Liquidity Needs

If an institution has relatively low (high) liquidity needs to support its regular day-to-day operations, then a higher (lower) allocation to illiquid alternative assets (e.g., private equity) would likely occur. Larger institutions tend to have lower liquidity needs and higher excess capital to invest in alternative assets.

ASSET ALLOCATION OBJECTIVES AND CONSTRAINTS

LO 1.1.3: 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.**

Asset owners' **objectives** are stated using both return and risk measures; therefore, a return objective must always be in context of the level of risk taken. Higher (lower) returns involve higher (lower) risk, so the objectives must make sense in the current economic environment and be consistent with the owners' risk tolerance.

A **constraint** must be incorporated into any investment strategy for the client.

Internal constraints are set by the client and could be impacted by liquidity requirements, investment horizon, and restrictions on holding certain assets.

External constraints arise due to market forces and, therefore, are beyond the client's control. Regulations may limit the types of assets in which the institutional investor may invest, and high transaction costs may reduce the universe of investible assets.

Types of Internal Constraints

Liquidity

- A client may have specific cash outflows within the next 12 months that need to be met.
- Requirements for a minimum amount or percentage of cash and liquid investments may be implemented together with maximums for illiquid investments.

Time Horizon

- Time horizons are often linked to liquidity and/or risk. For example, short (long) time horizons usually mean asset allocations need to be less (more) risky due to less (more) time being available to recoup any potential losses.
- Some assets such as commodities display mean reversion over the long term, so a client with a shorter (longer) time horizon may decrease (increase) its allocation to commodities.

Sector and Country Limits

- Some foundations have self-imposed *responsible investing* restrictions that limit or prohibit investment in stocks involved with alcohol and tobacco, for instance. Some national pension plans are not permitted to invest in specific countries.
- In the presence of such limits, it is useful to demonstrate to clients (via simulated asset allocations) what returns could have been generated had such limits not been imposed, allowing clients to assess the opportunity cost of such constraints.

Types of External Constraints

Tax Status

- With many institutional clients (e.g., endowments, foundations, national pension plans) not being subject to income tax, allocations to tax-exempt investments would