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CAIA®

EXAM PREP

SchweserNotes™

Risk and Risk Management & Methods and Models

Level II Book 2

KAPLAN SCHWESER

Book 2: Risk and Risk Management & Methods and Models

SchweserNotes™ 2027

CAIA Level II



SCHWESERNOTES™ 2027 CAIA® LEVEL II BOOK 2: RISK AND RISK MANAGEMENT & METHODS AND MODELS

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Readings and Learning Objectives

TOPIC 4

CAIA Association. *CAIA Curriculum Level II Volume II.* Self-published, CAIA Association, 2026.

Reading 4.1: Hedging Portfolios

4.1.1: 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.

4.1.2: 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.

4.1.3: 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.

4.1.4: 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.

4.1.5: 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.

Reading 4.2: Benchmarking and Performance Attribution

4.2.1: 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.

4.2.2: 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.

4.2.3: Demonstrate knowledge of evidence of alpha across the investment universe.
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- Describe the contribution of inaccessible risk premium to a return stream.
- Contrast transitional alpha with inaccessible risk premium.
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4.2.4: Demonstrate knowledge of analyzing evidence of manufactured alpha.
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- Assess performance contributions from manufactured alpha.
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- Understand how allocators can disaggregate drivers for revenue growth.

4.2.5: Demonstrate knowledge of basics in benchmarking and performance attribution.
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- 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.

4.2.6: Demonstrate knowledge of single factor benchmarking and performance attribution.
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- Describe examples of single-factor benchmarking.
- Discuss considerations to be used in benchmarking.
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- Analyze time-series returns with a single-factor market-based regression model.
- Understand how to apply single-factor benchmarking.

4.2.7: Demonstrate knowledge of multifactor benchmarking.
Including:

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

4.2.8: 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 4.3: Applied Benchmarking

4.3.1: Demonstrate knowledge of how to benchmark commodities.
Including:
- Contrast the weighting of all positions on value versus quantity.
- 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.

4.3.2: 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.

4.3.3: Demonstrate knowledge of how to benchmark private equity funds.
Including:
- Describe listed asset-based benchmarks.
- Understand the Long Nickels Public Market Equivalents (LN-PME).
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- Discuss extensions to the PME method and other metrics.

4.3.4: Demonstrate knowledge of peer group returns as benchmarks.
Including:
- Understand the peer group method of benchmarking PE fund performance.

4.3.5: 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 noncore real estate.
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Reading 4.4: Liquidity and Funding Risks

4.4.1: 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.

4.4.2: Demonstrate knowledge of value at risk for managed futures.
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- Understand how to calculate value at risk (VaR) for a portfolio.
- Describe VaR using a parametric approach.
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4.4.3: 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.

4.4.4: 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.

4.4.5: 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.

4.4.6: 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.

4.4.7: 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 4.5: Risk Measurement, Risk Management, and Risk Systems

4.5.1: 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.

4.5.2: 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.

4.5.3: 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.

4.5.4: 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.

4.5.5: 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.
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4.5.6: 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.

4.5.7: 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.

TOPIC 5

CAIA Association. *CAIA Curriculum Level II Volume II*. Self-published, CAIA Association, 2026.

Reading 5.1: Modeling Overview and Fixed Income Models

5.1.1: 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.

5.1.2: 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.

5.1.3: 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.

5.1.4: 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 in the Merton 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.

5.1.5: Demonstrate knowledge of the Kealhofer, 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.

5.1.6: 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.

5.1.7: 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.
- Understand the five financial ratios that are used as inputs to determine Altman Z-scores.
- Evaluate Z-scores in Altman's credit scoring model.

Reading 5.2: Multifactor Equity Pricing Models

5.2.1: 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.

5.2.2: 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.

5.2.3: Demonstrate knowledge of the three challenges of empirical multifactor models.
Including:
- Understand how factors can be falsely identified.
- Contrast factor correlation with factor causation.
- Explain why the CAPM may not be sufficient.

5.2.4: 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.

5.2.5: 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.

5.2.6: 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.

Reading 5.3: Directional Strategies and Methods

5.3.1: 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.

5.3.2: Demonstrate knowledge of trend following technical directional strategies.
Including:
- Identify the metrics of technical analysis.
- Define the various trendsetting or momentum models.

5.3.3: 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.

5.3.4: 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.

5.3.5: 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.

5.3.6: 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.

5.3.7: Demonstrate knowledge of valuation methods for digital assets.
Including:

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

Reading 5.4: Multivariate Empirical Methods

5.4.1: 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.

5.4.2: 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.

5.4.3: 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.

5.4.4: 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.

5.4.5: 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.

5.4.6: 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.

Reading 5.5: Relative Value Methods

5.5.1: 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.
- Discuss examples illustrating risk arbitrage opportunities.
- Identify the steps of pairs trading and types of pairs trading.

5.5.2: 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.

5.5.3: Demonstrate knowledge of pairs trading in commodity markets based on spreads.
Including:

- Identify different commodity derivatives calendar spreads.
- State the three dimensions of commodity relative value strategies.
- Estimate the profitability of calendar spread trading.

- Understand processing spreads.
- Understand the two conditions that hold for producers that are hedgers.
- Evaluate substitution spreads.
- Describe quality spreads and location spreads.
- Interpret intramarket relative value strategies.

5.5.4: 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.

5.5.5: 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.

Reading 5.6: Valuation Methods for Private Assets: The Case of Real Estate

5.6.1: 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.

5.6.2: 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.

5.6.3: 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.

5.6.4: Demonstrate knowledge of various transaction-based indices and their biases.
Including:

- Apply the repeat-sales method.
- Identify advantages of the repeat-sales method.
- Identify disadvantages of the repeat-sales method.
- Analyze the hedonic pricing method.
- Identify steps in calculating a 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.

5.6.5: 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.

The following is a review of the Risk and Risk Management principles designed to address the learning objectives set forth by CAIA Association®. Cross-reference to CAIA Association Reading 4.1.

READING 4.1

HEDGING PORTFOLIOS

Topic 4

EXAM FOCUS

This reading focuses on risk management through the use of option positions. Alpha and beta can be separated, which permits customized risk management. Put-call parity and delta hedging are also presented as risk management tools. For the exam, understand how to hedge systematic risk. Also, be able to calculate the delta of call and put options. In addition, know when to apply a delta-hedging strategy and how to create a delta-neutral option portfolio. Finally, be able to identify the benefits of mean reversion for commodity investments.

MANAGING ALPHA

LO 4.1.1: 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.

Separating Alpha and Beta

Alpha and beta can be pursued independently of each other through the use of financial derivatives. The hunt for alpha involves finding investments that offer superior returns, even if they are outside of the benchmark used or traditional asset classes. Alternative assets can be a good fit for this process. The beta focus attempts to match a desired systematic risk exposure through a low-cost instrument.