

Corporate Finance & ERM Exam: Foundations of CFE
Fall 2014 & Spring 2015

Important Exam Information:

[Exam Registration](#)

Candidates may register online or with an application.

[Order Study Notes](#)

Study notes are part of the required syllabus and are not available electronically but may be purchased through the online store.

[Introductory Study Note](#)

The Introductory Study Note has a complete listing of all study notes as well as errata and other important information.

[Case Study](#)

A copy of the case study will be provided with the examinations.

Candidates will not be allowed to bring their copy of the case study into the examination room.

[Past Exams](#)

Past Exams from 2000-present are available on SOA website.

[Updates](#)

Candidates should be sure to check the Updates page on the exam home page periodically for additional corrections or notices.

1. Topic: Corporate Finance - Funding

Learning Objective

The candidate will understand how a business enterprise funds its activities with considerations for its business model, and the cost and constraints of the sources of capital.

Learning Outcomes

The Candidate will be able to:

Sources of capital

- a) Describe the steps to procuring capital funding (treasury function).
- b) Assess the various features and implications of various sources of capital funding and recommend the optimal approach for funding.
- c) Interpret financial reinsurance and securitisation as a form of capital funding.

Uses of capital

- d) Assess whether the risky return from a new project or ongoing business is sufficient to employ investor capital.
- e) Evaluate the return on employed capital using NPV, IRR and Payback period.
- f) Apply real options analysis to recommend and evaluate firm decisions on capital utilisation
- g) Evaluate the optimisation of risk capital allocation

Resources

- *Corporate Finance*, Berk, Jonathan and Demarzo, Peter, 3rd Edition
 - Ch. 7, 18, 22, 23 & 24
- F-100-13: Dynamic Financial Condition Analysis Handbook Ch 8
- F-101-13: Capital Allocation in Financial Firms
- F-111-14: The Three Steps Raising Capital and Why Most Companies Fail Miserably
- F-112-14: Six steps to Raising Venture Capital

2. Topic: Capital Management - Decision-Making
Learning Objective
The candidate will understand how an enterprise's structure and policies allow its management to prioritize and select among projects or business activities that are competing for scarce capital resources.
Learning Outcomes
The Candidate will be able to: <u>Corporate structure</u> a. Evaluate how the legal form of an organization, corporate governance and/or compensation dynamics impact decision-making on projects or business activities. <u>Capital Structure</u> b. Describe the factors impacting short-term capital needs c. Recommend an optimal capital structure and how to implement it for a given business or strategy <u>Capital Optimization</u> d. Evaluate the capital efficiency of using reinsurance or securitizations for a given risk e. Describe considerations for the risk borne by capital employed f. Design a risk management plan to optimize the risk reward trade off of capital employed <u>Biases of Decision Making</u> g. Evaluate human behavioral biases in the decision making processes
Resources
<ul style="list-style-type: none">• <i>Corporate Finance</i>, Berk, Jonathan and Demarzo, Peter, 3rd Edition<ul style="list-style-type: none">○ Ch. 1–3, 14–16, 26, 27, 29 & 30• F-103-13: Chapter 8 of <i>Options Futures and other Derivatives</i>, Hull• F-113-14: Securitization, Insurance and Reinsurance• F-114-14: Behavioral Biases and Corporate Decision Making on Investing Abroad• F-115-14: Overcoming a bias against Risks• F-116-14: The High Risks of Short-Term Management• F-117-14: Strategic Leadership: Short-Term Stability and Long-Term Viability

3. Topic: Stochastic Modelling
Learning Objective
The candidate will understand how and when to apply various stochastic techniques to situations which have uncertain financial outcomes.
Learning Outcomes
The Candidate will be able to: <ul style="list-style-type: none">a) Explain the mathematical foundation of stochastic simulation.b) Assess the appropriateness of a given stochastic simulation technique to quantify various market risk exposures.c) Recommend the use of techniques to reduce the computational demand when applying stochastic methodology.d) Assess the strengths and weaknesses of the calibration techniques for a given stochastic model.e) Interpret the results of a given application of stochastic modelling and the impact of the chosen calibration process used.f) Explain the differences and implications of the use of P-measure and Q-measure for risk assessment.g) Explain the benefits and limitations of Value-at-Risk, Incremental Value-at-Risk, Component Value-at-Risk, and Expected Shortfall as tail risk measures.
Resources
<ul style="list-style-type: none">• <i>Stochastic Simulation and Applications in Finance</i>, Huynh, Huu Tue, et. al.<ul style="list-style-type: none">○ Ch. 1,(background)○ Ch.2 Introduction to Random Variables○ Ch. 3 Random Sequences○ Ch. 4 Introduction to Computer Simulation of Random Variables○ Ch. 5 Foundation of Monte Carlo,○ Ch. 6 Fundamental of Quasi Monte Carlo Method,○ Ch. 7 Introduction to Random Processes 7.1.1, 7.1.2, 7.3.1-7.3.3,○ Ch. 8 Solution of Stochastic differential equation,○ Ch. 9 General Approach of Valuation Technique, (Background)○ Ch. 10 Pricing Options using Monte Carlo Simulations only 10.1,○ Ch. 11 Term Structure of Interest Rate and Interest Rate Derivatives,○ Ch. 14 Risk Management and VaR○ Ch. 15 VaR and Principal Component Analysis• <i>Measures of Market Risk</i>, Dowd, Kevin, 2nd Edition<ul style="list-style-type: none">○ Ch. 2 Measures of Financial Risk,

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- Ch. 3 Estimating Market Risk Measures,
- Ch. 4 Non Parametric Approaches INCLUDING Appendices 1-4,
- Ch. 8 Monte Carlo Simulation Methods,
- Ch. 9 Applications of Stochastic Risk Measurement Methods,
- Ch. 11 Incremental and Component Risks
- F-104-13: *Oxford Guide to Financial Modeling*, Ho & Lee, Ch. 5 & 6
5.1-5.4 (Page 123 to Page 140), 5.5-5.7 (Page 156 to Page 163)
6.1-6.5 (Page 172 to Page 188), 6.8-6.9 (Page 195 to Page 203)
6.12 (Page 209 to Page 211), 6.14
- F-105-13: [Interest Rate Swap – Exposed](#)
- F-106-13: *Investment Guarantees*, Hardy, Ch. 3 & 4
- F-110-13: Chapters 4 and 5 of *Financial Economics*, Panjer, Harry, et. al.
- [Predictive Modeling](#) by R. Xu, *SOA Forecasting and Futurism* July 2013 issue 7
- [Hidden Markov Models and You](#), by D. Norris and B. Gossmiller, *SOA Forecasting and Futurism* July 2013 issue 7
- [Layering Your Own Views into a Stochastic Simulation—Without a Recalibration](#) by T. Dardis, L. Grandchamp and D. Antonio *Risk & Rewards*, August 2013

4. Topic: Advanced Risk Assessment Techniques
Learning Objective
The candidate will understand how to critique the appropriateness of advanced risk assessment methods for a given situation.
Learning Outcomes
The Candidate will be able to: <u>Pricing</u> a) Apply and interpret the results of equilibrium pricing and no-arbitrage pricing theory to risk valuation. <u>Cost of Capital Methods</u> b) Evaluate the risk margin as a cost of risk capital within a risk valuation framework. <u>Concept of Tail Correlation and Copula</u> c) Evaluate the limitations of modelling dependences in risk variables. d) Recommend when to use Markov Chain Models to evaluate risk. e) Assess when a copular based capital aggregation model is desired over a correlation matrix based approach. <u>Operational Risk</u> f) Assess approaches to quantify risks when there is limited data.
Resources
<ul style="list-style-type: none">• <i>Measuring Market Risk</i>, Kevin Dowd, 2nd Edition<ul style="list-style-type: none">○ Ch. 5 forecasting volatilities covariances and correlation including appendix – Modelling Dependence: Correlations and Copula.• <i>Stochastic Simulation and Applications in Finance</i>, Huynh, Huu Tue, et. al.<ul style="list-style-type: none">○ Ch. 4.6 MCMC○ Ch. 15 VaR and Principal Component Analysis• F-107-13: A Market Cost of Capital Approach to Market Value Margins• F-109-13: Application of Coherent Risk Measures to Capital Requirements in Insurance• F-110-13: Chapters 4 and 5 of <i>Financial Economics</i>, Panjer, Harry, et. al.• F-118-14: Modern Operational Risk Management• A Risk Management Tool for Long Liabilities: The Static Control Model, 2009 Enterprise Risk Management Monograph• A Practical Concept of Tail Correlation 2008 Enterprise Risk Management Monograph• Measuring Operational Risk Interdependencies using Interpretative Structural Modeling, 2007 ERM Symposium, Concurrent Sessions 3• Recognizing When Black Swans Aren't: Holistically Training Management to Better Recognize, Assess and Respond to Emerging Extreme Events - By G.F.A.Werther and R.T. Herget (Glossary as background reading)

5. Topic: Financial Risk Management
Learning Objective
The candidate will understand how to identify and recommend appropriate risk assessment and monitoring techniques for financial risk management.
Learning Outcomes
The Candidate will be able to: <ul style="list-style-type: none">a) Evaluate the methods and processes for measuring and monitoring market risk positions.b) Describe the types of models and the sources of model risk.c) Assess the methods and process for quantifying and managing model risk within a financial institution.d) Design an appropriate stress-testing process and evaluate its limitations for a given risk position.e) Interpret the results of back-testing.
Resources
<ul style="list-style-type: none">• <i>Measures of Market Risk</i>, Dowd, Kevin , 2nd Edition<ul style="list-style-type: none">○ Ch. 2 Measures of Financial Risk○ Ch. 3 Estimating Market Risk Measures and Introduction and Overview○ Ch. 4 Non-parametric Approaches (Including Appendix 1 – 4)○ Ch. 6&7 Parametric Models○ Ch. 10 Option Risk measures○ Ch. 12 Mapping Positions to Risk Factors○ Ch. 13 Stress Testing Risk○ Ch. 15 Back Testing Risk○ Ch. 16 Model Risk• <i>Variable Annuities A Global Perspective</i>, Kalberer, Tigran and Ravindran, Kannoo<ul style="list-style-type: none">○ Ch. 8, 9, 15, 16 & 17• <i>Stochastic Simulation and Applications in Finance</i>, Huynh, Huu Tue, et. al.<ul style="list-style-type: none">○ Ch. 14 Risk Management and VaR• How Model Risk Devastated an Organization, by S. Segal, SOA, <i>The Actuary</i>, June/July 2013 Issue