

Corporate Finance & ERM Exam: Foundations of CFE  
Fall 2013

**Important Exam Information:**

<a href="#">Exam Date and Time</a>	A read-through time will be given prior to the start of the exam—15 minutes in the morning session and 15 minutes in the afternoon session.
<a href="#">Exam Registration</a>	Candidates may register online or with an application.
<a href="#">Order Study Notes</a>	Study notes are part of the required syllabus and are not available electronically but may be purchased through the online store.
<a href="#">Introductory Study Note</a>	The Introductory Study Note has a complete listing of all study notes as well as errata and other important information.
<a href="#">Case Study</a>	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.
<a href="#">Past Exams</a>	Past Exams from 2000-present are available on SOA website.
<a href="#">Updates</a>	Candidates should be sure to check the Updates page on the exam home page periodically for additional corrections or notices.

<b>1. Topic: Corporate Finance - Funding</b>
<b>Learning Objective</b>
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.
<b>Learning Outcomes</b>
The Candidate will be able to:  <u>Sources of capital</u> 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.  <u>Uses of capital</u> a) Assess whether the risky return from a new project or ongoing business is sufficient to employ investor capital. b) Evaluate the return on employed capital using NPV, IRR and Payback period. c) Apply real options analysis to recommend and evaluate firm decisions on capital utilisation d) Describe the methods of allocating risk capital
<b>Resources</b>
<ul style="list-style-type: none"><li>• <i>Corporate Finance</i>, Berk, Jonathan and Demarzo, Peter, 3<sup>rd</sup> Edition<ul style="list-style-type: none"><li>○ Ch. 7, 18, 22, 23 &amp; 24</li></ul></li><li>• F-100-13: Dynamic Financial Condition Analysis Handbook 8</li><li>• F-101-13: Capital Allocation in Financial Firms</li></ul>

<b>2. Topic: Capital Management - Decision-Making</b>
<b>Learning Objective</b>
The candidate will understand how an enterprise's structure and policies allow its management to prioritise and select among projects or business activities that are competing for scarce capital resources.
<b>Learning Outcomes</b>
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
<b>Resources</b>
<ul style="list-style-type: none"><li>○ <i>Corporate Finance</i>, Berk, Jonathan and Demarzo, Peter, 3<sup>rd</sup> Edition</li><li>○ Ch. 1–3, 14–16, 26, 27, 29 &amp; 30</li><li>● F-102-13: Chapters 5 and 16 of <i>Life, Health and Annuity Reinsurance</i>, Tiller</li><li>● F-103-13: Chapter 8 of <i>Options Futures and other Derivatives</i>, Hull</li><li>● F-110-13: Sections 2.7, 2.8 and 2.9 of <i>Financial Economics</i>, Panjer, Harry, et. al.</li><li>● <a href="#">Financial Decision-Making in Markets and Firms: A Behavioural Perspective</a>, the National Bureau of Economic Research Working Paper, June 1994</li></ul>

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

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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
- 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.

<b>4. Topic: Advanced Risk Assessment Techniques</b>
<b>Learning Objective</b>
The candidate will understand how to critique the appropriateness of advanced risk assessment methods for a given situation.
<b>Learning Outcomes</b>
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) Compare and Contrast the methods that quantify the cost of capital within a risk valuation framework. <u>Concept of Tail Correlation and Copula</u> c) Describe the limitations of modelling dependences in risk variables. d) Apply techniques to estimate tail correlation for long dated liabilities. <u>Operational Risk</u> e) Explain how to quantify risk when there is limited data
<b>Resources</b>
<ul style="list-style-type: none"><li>• <i>Measuring Market Risk</i>, Kevin Dowd, 2<sup>nd</sup> Edition<ul style="list-style-type: none"><li>○ Ch. 5 forecasting volatilities covariances and correlation including appendix – Modelling Dependence: Correlations and Copula.</li></ul></li><li>• <i>Stochastic Simulation and Applications in Finance</i>, Huynh, Huu Tue, et. al.<ul style="list-style-type: none"><li>○ Ch. 4.6 MCMC</li><li>○ Ch. 15 VaR and Principal Component Analysis</li></ul></li><li>• F-107-13: A Market Cost of Capital Approach to Market Value Margins</li><li>• F-109-13: Application of Coherent Risk Measures to Capital Requirements in Insurance</li><li>• F-110-3: Chapters 4 and 5 of <i>Financial Economics</i>, Panjer, Harry, et. al.</li><li>• <a href="#">A Risk Management Tool for Long Liabilities: The Static Control Model</a>, 2009 Enterprise Risk Management Monograph</li><li>• <a href="#">A Practical Concept of Tail Correlation</a> 2008 Enterprise Risk Management Monograph</li><li>• <a href="#">Measuring Operational Risk Interdependencies using Interpretative Structural Modeling</a>, 2007 ERM Symposium, Concurrent Sessions 3</li></ul>

<b>5. Topic: Financial Risk Management</b>
<b>Learning Objective</b>
The candidate will understand how to identify and recommend appropriate risk assessment and monitoring techniques for financial risk management.
<b>Learning Outcomes</b>
The Candidate will be able to: <ul style="list-style-type: none"><li>a) Evaluate the methods and processes for measuring and monitoring market risk positions.</li><li>b) Describe the types of models and the sources of model risk.</li><li>c) Assess the methods and process for quantifying and managing model risk within a financial institution.</li><li>d) Design an appropriate stress-testing process and evaluate its limitations for a given risk position.</li><li>e) Interpret the results of back-testing.</li></ul>
<b>Resources</b>
<ul style="list-style-type: none"><li>• <i>Measures of Market Risk</i>, Dowd, Kevin , 2<sup>nd</sup> Edition<ul style="list-style-type: none"><li>○ Ch. 2 Measures of Financial Risk</li><li>○ Ch. 3 Estimating Market Risk Measures and Introduction and Overview</li><li>○ Ch. 4 Non-parametric Approaches (Including Appendix 1 – 4)</li><li>○ Ch. 6&amp;7 Parametric Models</li><li>○ Ch. 10 Option Risk measures</li><li>○ Ch. 12 Mapping Positions to Risk Factors</li><li>○ Ch. 13 Stress Testing Risk</li><li>○ Ch. 15 Back Testing Risk</li><li>○ Ch. 16 Model Risk</li></ul></li><li>• <i>Variable Annuities A Global Perspective</i>, Kalberer, Tigran and Ravindran, Kannoo<ul style="list-style-type: none"><li>○ Ch. 8, 9, 15, 16 &amp; 17</li></ul></li><li>• <i>Stochastic Simulation and Applications in Finance</i>, Huynh, Huu Tue, et. al.<ul style="list-style-type: none"><li>○ Ch. 14 Risk Management and VaR</li></ul></li><li>• F-108-13: <i>The Known, the Unknown, and the Unknowable in Financial Risk Management: Measurement and Theory Advancing Practice</i>, Diebold, et.al., Ch. 3</li></ul>