

# Advanced Finance/ERM

## Fall 2008

### Important Exam Information

The examination for this course will be given on Thursday, October 30<sup>th</sup> 8:30am–11:45am and 1:30pm–4:45pm and will consist of six hours of written-answer questions. 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. Information regarding registering for exams is available on the [Exam Registration](#) page.

For Fall 2008, this exam includes a [case study](#) for the examination. The case study will also be distributed in the Study Note package. **Candidates will not be allowed to bring their copy of the case study into the examination room.**

Study notes are part of the required Course of Reading and are not available electronically. The [Introductory Study Note](#) has a complete listing of all study notes. Candidates must order the study notes from the Society of Actuaries using the [Study Note Order Form](#). There are no revisions to the study notes from the Spring 2008 session. Past exams are available on the Exam Archives page of the SOA web site under [Multiple Choice/Essay Examinations](#).

Candidates should be sure to check the [Updates](#) page of the web site periodically for additional corrections or notices.

The candidate should be very familiar with the Learning Objectives as described in the Basic Education Catalog. These Learning Objectives are the first ingredient in developing the syllabus and also guide the examination committee when writing questions. The Learning Objectives set out the cognitive level needed to pass this exam. You will notice that the candidates are expected to “analyze,” “explain,” “calculate,” “describe,” “apply,” etc. While studying the syllabus material, candidates may want to refer back to the Learning Objectives to remain focused on the goals of the exam.

Advanced Finance/ERM	
Instructional Objectives (Corp. Finance)	
1. Product Knowledge	
Learning Outcomes	
The candidate will be able to:	
<ul style="list-style-type: none"> <li>a) Explain why an insurance institution would develop certain products, and provide an analysis of product-development process, including the effects of taxation and regulation on product design</li> <li>b) Identify all risks, including all hidden and embedded risks, categorize, and evaluate potential sources of risk in products offered by both insurance companies and other financial institutions <ul style="list-style-type: none"> <li>▪ Define insurance risk as related to product design and pricing risk, mortality risk, morbidity risk, lapse risk, interest rate risk, liquidity risk, and expense risk</li> <li>▪ Identify exposure triggers of the sources of risk</li> <li>▪ Identify the direct and indirect consequences of risk</li> </ul> </li> <li>c) Describe how and why risks are correlated (re product risks vs. firm)</li> <li>d) Describe the management of product design and pricing risk in consideration of actuarial standards and regulatory guidelines (insurance and non-insurance, e.g. banking)</li> <li>e) Describe the use of underwriting and reinsurance policies and procedures to determine insurability and to manage exposure</li> </ul>	
Syllabus Resources	

## Advanced Finance/ERM Fall 2008

- Hardy, *Investment Guarantees*, 2003 Chapter 6
- Tiller, *Life, Health and Annuity Reinsurance*, Third Edition, 2005, Chapter 5, Advanced Methods of Reinsurance
- FE-C151-08 , Atkinson & Dallas, *Life Insurance Products and Finance* Chapter 13 (sections 13.1 – 13.4) Annuity and Investment Products
  
- FE-C102-07 (Formerly 8FE-306-01), General American Can't Pay It's Bills
- FE-C103-07 (formerly 8FE-322-04), The Missing Risk in Pricing of Equity-Based Products
- FE-C106-07 (formerly 8E-704-04), Mapping of Life Insurance Risks
- FE-C115-07, Atkinson and Dallas *Life Insurance Products and Finance*, Chapters 2 and 3
- FE-C137-07 (formerly 8E-705-04), Moody's Looks at Risk Management and the New Life Insurance Risks
  
- Max Rudolph: "Influenza Pandemics: Are We Ready for the Next One", Risk Management section newsletter, July 2004 <http://www.soa.org/library/unclassified/rm0407.pdf>
  
- "Fixed Annuities in Low Interest Rate Environment", Product Development newsletter, April 2003 <http://www.soa.org/library/newsletters/product-development-news/2003/april/pdn0304.pdf>
  
- "Managing Variable Policyholder Behavior Risk", Product Development newsletter, March 2005 <http://www.soa.org/library/newsletters/product-development-news/2005/march/pdn0503.pdf>
  
- "Designing and Pricing LTCI Combination Products", Long Term Care newsletter, December 2004 <http://www.soa.org/library/newsletters/long-term-care/2004/december/ltc0412.pdf>
  
- ASOP 12 Risk Classification (excl. appendix) [http://www.soa.org/files/pdf/asop012\\_101.pdf](http://www.soa.org/files/pdf/asop012_101.pdf)
  
- "Death Benefit Focused UL", Product Development section newsletter, April 2003 <http://www.soa.org/library/newsletters/product-development-news/2003/april/pdn0304.pdf>
  
- "Whither the Variable Annuity", Product Development section newsletter, November 2003 <http://www.soa.org/library/newsletters/product-development-news/2003/november/pdn0311.pdf>

## Advanced Finance/ERM Fall 2008

Advanced Finance/ERM	
Instructional Objectives	
2. Capital Funding and Structure	
Learning Outcomes	
<p>The candidate will be able to:</p> <ol style="list-style-type: none"> <li>a) Calculate the cost of capital for a venture using the most appropriate method for given circumstances and justify the choice of method</li> <li>b) Evaluate various profitability measures including IRR, NPV and ROE, etc.</li> <li>c) Identify regulatory capital requirements and describe how they affect decisions</li> <li>d) Identify the goals and methodologies of rating agencies and how their rating activities affect financial institutions</li> </ol> <p>Capital Structure</p> <ol style="list-style-type: none"> <li>e) Describe how rating agencies affect the choice of capital structure</li> <li>f) Describe how behavioral characteristics and biases of users and providers of capital affect the capital structure</li> </ol> <p>Capital Sources</p> <ol style="list-style-type: none"> <li>g) Describe the process, methods and uses of financial reinsurance (surplus relief) and recommend a structure that is appropriate for a given set of circumstances</li> <li>h) Describe the process, methods and uses of insurance securitizations and recommend a structure that is appropriate for a given set of circumstances</li> </ol> <p>Capital Uses</p> <ol style="list-style-type: none"> <li>i) Describe the process, methods and effects of a potential acquisition or reinsurance of a business including its effect on capital structure, return on equity, price/earnings multiples, and share price</li> </ol>	
Syllabus Resources	
<ul style="list-style-type: none"> <li>• Crouhy, <i>Risk Management</i>, 2001, Chapter 2</li> <li>• Tiller, <i>Life, Health and Annuity Reinsurance</i>, Chapter 5, Advanced Methods of Reinsurance</li> <li>• Toole and Herget, <i>Insurance Industry Mergers &amp; Acquisitions</i>, 2005, Chapters 1-4</li>   <li>• FE-C108-07, Cost of Capital for Financial Firms by Exley and Smith</li> <li>• FE-C109-07 (formerly 8FE-100-00), Solvency Measurement for Property-Liability Risk-Based Capital Applications</li> <li>• FE-C110-07, Tillinghast, "Preparing for C-3 Phase II RBC"</li> <li>• FE-C111-07 (formerly 8FE-406-02), Standard and Poor's Insurance Liquidity Model for 2000</li> <li>• FE-C112-07 (formerly 8FE-407-02) Standard &amp; Poor's Life Insurance Earnings Adequacy Model, Revised for 2001</li> <li>• FE-C113-07 (formerly 8E-702-04), New Insurance Capital Model Embraces Trends in Risk Management</li> <li>• FE-C114-07 (formerly 8F-402-00) Financial Decision-Making: A Behavioral Perspective</li> <li>• FE-C117-07, <i>Integrated Risk Management</i>, Doherty, Chapter 16, A Case Study: The Securitization of Catastrophic Risk</li> <li>• FE-C118-07 (formerly 8FE-414-05) Securitization of Life Insurance Assets and Liabilities</li> <li>• FE-C119-07 (formerly 8F-501-04), Are You Paying Too Much for That Acquisition?</li> <li>• FE-C120-07 (formerly 8F-502-04), Insurance Mergers &amp; Acquisitions</li> </ul>	

## Advanced Finance/ERM Fall 2008

<ul style="list-style-type: none"> <li>• FE-C128-07 (formerly 8FE-316-03), Asset Liability Management, IASA Handbook</li> <li>• FE-C150-08, Copeland, Weston, Shastri, <i>Financial Theory and Corporate Policy</i>, Chapters 2 and 9</li> <li>• Michelle D. Smith, <i>The Financial Reporter</i>, 9/03, “Investor &amp; Management Expectations of the “Return on Equity” Measure vs. Some Basic Truths of Financial Accounting” <a href="http://www.soa.org/library/newsletters/financial-reporter/2003/september/frn0309.pdf">http://www.soa.org/library/newsletters/financial-reporter/2003/september/frn0309.pdf</a></li> </ul>
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Advanced Finance/ERM	
Instructional Objectives	
3. Financial Reporting	
Learning Outcomes	
The candidate will be able to:	
a) Analyze a specific company financial situation by demonstrating advanced knowledge of balance sheet and income statement structures	
Syllabus Resources	
<ul style="list-style-type: none"> <li>• FE-C121-07 (formerly 8FE-412-05), Financial Reporting Developments Accounting For Derivative Instruments and Hedging Activities: A Comprehensive Analysis of FASB Statement 133, as Amended and Interpreted (Overview and Appendix C only)</li> <li>• FE-C122-07 (formerly 8F-500-04), FASB Statement of Financial Concepts No. 5 - Recognition and Measurement in Financial Statements of Business Enterprises</li> <li>• FE-C149-07, CIA –Use of Stochastaic Techniques to Value Liabilities under Canadian GAAP</li> <li>• AAA Life Reserves Work Group – Requirements for Principles-Based Reserves for Life Products March 2007 draft <a href="http://www.actuary.org/pdf/life/lrwgReq_march07.pdf">http://www.actuary.org/pdf/life/lrwgReq_march07.pdf</a></li> </ul>	

Advanced Finance/ERM	
Instructional Objectives	
4. Measuring Value	
Learning Outcomes	
The candidate will be able to:	
a) Compare and contrast different approached to the fair value of insurance liabilities	
b) Apply an appropriate fair value methodology in a given situation	
c) Describe the concept of economic measures of value (e.g. EVA; embedded value) and their uses in corporate decision-making process	
d) Describe how the performance of a given firm or venture may be evaluated against its objectives including total returns	
Syllabus Resources	
<ul style="list-style-type: none"> <li>• Chew, <i>The New Corporate Finance: Where Theory Meets Practice</i>, Chapters 3 and 9</li> <li>• FE-C123-07 (formerly 8FE-320-01), Vanderhoof, The Fair Value of Insurance Business, Chapter 4</li> <li>• Fair Value of Liabilities – Financial Economics Perspective, Babbel, Gold and Merrill <a href="http://www.soa.org/files/pdf/naaj0201_2.pdf">http://www.soa.org/files/pdf/naaj0201_2.pdf</a></li> <li>• FE-C124-07 (formerly 8V-314-01) Performance Measurement Using Transfer Pricing, by Marcia Wallace</li> </ul>	

## Advanced Finance/ERM Fall 2008

- FE-C125-07 (formerly 8FE-307-01), Total Return Approach to Performance Measurement

Advanced Finance/ERM	
Instructional Objectives	
5. Risk Management	
Learning Outcomes	
The candidate will be able to:	
<ul style="list-style-type: none"> <li>a) Identify and describe means for transferring risk to a third party, and to identify the costs and benefits of doing so</li> <li>b) Identify and describe means for reducing risk without transferring it (internal hedges)</li> <li>c) Demonstrate how derivatives, synthetic securities, and financial contracting may be used to reduce risk or to assign it to the party most able to bear it</li> <li>d) Describe how the performance of risk transference activities may be evaluated</li> <li>e) Describe how financial risks and opportunities influence the selection of product strategy</li> <li>f) Compare and contrast the risk in the pension plan itself vs. the risk of a pension plan on the corporation</li> </ul>	
Syllabus Resources	
<ul style="list-style-type: none"> <li>• Chew, <i>The New Corporate Finance: Where Theory Meets Practice</i>, Third Edition, 2001, Chapter 27</li> <li>• Hardy, <i>Investment Guarantees</i>, 2003, Chapters 8, 9 (pg. 157-169 only) and 13</li> <li>• Tiller <i>Life, Health and Annuity Reinsurance</i>, Third Edition 2005, Chapters 5, 16, 17</li> <li>• FE-C115-07, Atkinson &amp; Dallas, <i>Life Insurance Products and Finance</i> Chapter 2 Prod. Dev</li> <li>• FE-C118-07 (formerly 8FE-414-05), <i>Securitization of Life Insurance Assets and Liabilities</i></li> <li>• FE-C126-07 (formerly 8FE-203-00) <i>Risk Management by Insurers: An Analysis of the Process</i></li> <li>• FE-C127-07 (formerly 8FE-319-02) <i>Asset Liability Management for Insurers</i></li> <li>• FE-C128-07 (formerly 8FE-316-03), <i>Asset/ Liability Management, IASA Handbook</i></li> <li>• FE-C129-07 (formerly 8E-707-04), <i>Principles for the Management of Interest Rate Risk</i></li> <li>• FE-C130-07 (formerly 8E-712-05), <i>Hedging with Derivatives in Traditional Insurance Products</i></li> <li>• FE-C131-07 (formerly 8V-320-05), <i>Creating Value in Pension Plans (or, Gentlemen Prefer Bonds)</i></li> <li>• “Accounting/Actuarial Bias Enables Equity Investment by Defined Benefit Pension Plans”, by Jeremy Gold, NAAJ July 2005 <a href="http://www.soa.org/library/journals/north-american-actuarial-journal/2005/july/naaj0903-1.pdf">http://www.soa.org/library/journals/north-american-actuarial-journal/2005/july/naaj0903-1.pdf</a></li> </ul>	

## Advanced Finance/ERM Fall 2008

Advanced Finance/ERM	
Instructional Objectives (ERM)	
6. Enterprise Risk Management Framework	
Learning Outcomes	
<p>The candidate will be able to:</p> <ol style="list-style-type: none"> <li>a) Define Enterprise Risk Management</li> <li>b) Describe the fundamental concepts of financial and non-financial risk management and evaluate a particular given risk-management framework</li> <li>c) Describe various regulatory/industry frameworks: Basle II, Sarbanes-Oxley Act, OSFI Supervisory Framework, OSFI Standard of Sound Financial and Business Practices, UK FSA guidelines, and COSO</li> <li>d) Understand the perspectives of regulators, rating agencies, stock analysts, and company stakeholders and describe how they evaluate the risks and the risk management of an organization</li> <li>e) Describe how an organization can create a risk management culture including: risk consciousness, accountabilities, discipline, collaboration, and communication</li> <li>f) Articulate risk objectives and a risk philosophy</li> <li>g) Describe a desired risk profile and appropriate risk filters</li> <li>h) Describe and assess the elements of a successful risk management function and recommend a structure for an organization's risk management function</li> <li>i) Describe and apply a risk control process such as the Risk Management Control Cycle or other similar approach</li> </ol>	
Syllabus Resources	
<ul style="list-style-type: none"> <li>• Chew, <i>The New Corporate Finance: Where Theory Meets Practice</i>, Third Edition, 2001, Chapter 29</li> <li>• Crouhy, <i>Risk Management</i>, 2001, Chapters 2 , 3, 17</li>   <li>• FE-C113-07 (formerly 8E-702-04), New Insurance Capital Model Embraces Trends in Risk Management</li> <li>• FE-C117-07, Doherty, <i>Integrated Risk Management</i>, Chapters 1, 7, 8</li> <li>• FE-C129-07 (formerly 8E-707-04), Principles for the Management of Interest Rate Risk</li> <li>• FE-C133-07 (formerly 8E-700-04), Internal Control – Guidance for Directors on the Combined Code</li> <li>• FE-C134-07 (formerly 8E-701-04), Supervisory Framework – 1999 and Beyond</li> <li>• FE-C135-07 (formerly 8FE-408-03), Financial Oversight of Enron: The SEC and Private-Sector Watchdogs (pp. 97-127 only)</li> <li>• FE-C136-07, Enterprise Risk Management And Risk Assessment, Nov 05</li> <li>• FE-C137-07 (formerly 8E-705-04), Moody’s looks at Risk Management and New Life Insurance Risks, October 2000</li>   <li>• “Risk Management: the Total Return Approach and Beyond”, Ho, Risk Management Newsletter, Nov 2004, Issue #3 <a href="http://www.soa.org/library/newsletters/risk-management-newsletter/2004/november/rmn0411.pdf">http://www.soa.org/library/newsletters/risk-management-newsletter/2004/november/rmn0411.pdf</a></li>   <li>• Enterprise Risk Management Specialty Guide, SOA 2006 <a href="http://www.soa.org/library/professional-">http://www.soa.org/library/professional-</a></li> </ul>	

## Advanced Finance/ERM Fall 2008

<p><a href="http://actuarial-specialty-guides/enterprise-risk-management/2005/august/spg0605erm.pdf">actuarial-specialty-guides/enterprise-risk-management/2005/august/spg0605erm.pdf</a></p> <ul style="list-style-type: none"> <li>• “A Case Study in Risk Management: U.S. Monetary Policy, Risk Management Newsletter – July 2004, McMillan <a href="http://www.soa.org/library/newsletters/risk-management-newsletter/2004/july/rmn0407.pdf">http://www.soa.org/library/newsletters/risk-management-newsletter/2004/july/rmn0407.pdf</a></li> <li>• The Financial Reporter, Dec. 2004, “Actuarial Aspects of SOX 404” <a href="http://www.soa.org/library/newsletters/financial-reporter/2004/december/frn0412.pdf">http://www.soa.org/library/newsletters/financial-reporter/2004/december/frn0412.pdf</a></li> <li>• The Financial Reporter, Dec. 2004, “Responsibilities of the Actuary for Communicating Sarbanes-Oxley Controls” <a href="http://www.soa.org/library/newsletters/financial-reporter/2004/december/frn0412.pdf">http://www.soa.org/library/newsletters/financial-reporter/2004/december/frn0412.pdf</a></li> </ul>
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Advanced Finance/ERM	Finance, ERM and Investment
Instructional Objectives	
7. ERM Fundamentals	
Learning Outcomes	
<p>The candidate will be able to:</p> <ul style="list-style-type: none"> <li>a) Describe how risk and opportunity influence the selection of a firm’s vision and strategy</li> <li>b) Describe how ERM is able to contribute to shareholder value creation</li> <li>c) Identify potential sources, categories, and consequences of risk</li> <li>d) Explain how risk metrics can be incorporated into the risk monitoring function as part of an ERM framework</li> <li>e) Describe means for managing risks and measures for evaluating their effectiveness</li> <li>f) Describe operational risks and governance issues including market conduct, audit, and legal risk</li> <li>g) Describe enterprise-wide risk aggregation techniques incorporating the use of correlation</li> </ul>	
Syllabus Resources	
<ul style="list-style-type: none"> <li>• Crouhy, <i>Risk Management</i>, 2001, Chapter 13</li> <li>• Hardy, <i>Investment Guarantees</i>, 2003, Chapters 4, 6, 9 (pp. 157-169 only) and 12</li> <li>• Chew, <i>The New Corporate Finance: Where Theory Meets Practice</i>, Third Edition, 2001, Chapter 6</li> <li>• FE-C104-07 (formerly 8E-708-04), Insurance OP Risk: The Big Unknown</li> <li>• FE-C108-07 The Cost of Capital for Financial Firms, Exley and Smith</li> <li>• FE-C117-07, Doherty, <i>Integrated Risk Management</i>, Chapters 7 and 8</li> <li>• FE-C133-07 (formerly 8E-700-04) Internal Control – Guidance for Directors on the Combined Code</li> <li>• FE-C138-07 “Managing the Invisible: Measuring Risk, Managing Capital, Maximizing Value”, Panning</li> <li>• FE-C139-07 (formerly 8E-715-06), No Assurance of Good Governance: Observations on Corporate Governance in the U.S. Insurance Sector</li> <li>• FE-C140-07, Risk Measurement, Risk Management and Capital Adequacy in Financial Conglomerates (excl Appendices)</li> <li>• FE-C142-07 “Theory and Practice of Model Risk Management” Ricardo Rebonato</li> <li>• FE-C143-07 (formerly 8FE-403-01), Dynamic Financial Models of Property-Casualty Insurers</li> <li>• FE-C144-07 (formerly 8F-313-01), Disciplined Decisions Aligning Strategy with the Financial Markets</li> <li>• FE-C145-07 (formerly 8F-400-00), Dynamic Financial Condition Analysis Handbook, Chapter 1 (background only), 8 and Appendix A</li> <li>• “Risk Aggregation for Capital Requirements Using the Copula Technique”, Song Zhang, Risk</li> </ul>	

## Advanced Finance/ERM Fall 2008

<p>Management Newsletter,, March 2005, Issue #4 <a href="http://www.soa.org/library/newsletters/risk-management-newsletter/2005/march/rmn0503.pdf">http://www.soa.org/library/newsletters/risk-management-newsletter/2005/march/rmn0503.pdf</a></p> <ul style="list-style-type: none"> <li>• TSA XXXVIII Strategic Management of Life Company Surplus <a href="http://www.soa.org/library/research/transactions-of-society-of-actuaries/1986/january/tsa86v387.pdf">http://www.soa.org/library/research/transactions-of-society-of-actuaries/1986/january/tsa86v387.pdf</a></li> <li>• “Risk Management: The Total Return Approach and Beyond”, Ho, Risk Management Newsletter, Nov. 2004, Issue #3 <a href="http://www.soa.org/library/newsletters/risk-management-newsletter/2004/november/rmn0411.pdf">http://www.soa.org/library/newsletters/risk-management-newsletter/2004/november/rmn0411.pdf</a></li> <li>• “Application of Coherent Risk Measures to Capital Requirements in Insurance”, Artzner, -NAAJ, Vol 3, No 2 <a href="http://www.soa.org/library/journals/north-american-actuarial-journal/1999/april/naaj9904_1.pdf">http://www.soa.org/library/journals/north-american-actuarial-journal/1999/april/naaj9904_1.pdf</a></li> </ul>
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Advanced Finance/ERM	
Instructional Objectives	
8. Credit Risk	
Learning Outcomes	
<p>The candidate will be able to:</p> <ol style="list-style-type: none"> <li>a. Define and evaluate credit risk as related to fixed income securities</li> <li>b. Define and evaluate spread risk as related to fixed income securities as well as high yield bond analysis</li> <li>c. Describe best practices in credit risk measurement, modeling and management</li> <li>d. Describe the use of credit and underwriting policies, diversification requirements</li> <li>e. Define credit risk as related to derivatives, define credit risk as related to reinsurance ceded counter party risk and describe the use of comprehensive due diligence and aggregate counter-party exposure limits</li> <li>f. Describe risk mitigation techniques and practices: credit derivatives, diversification, concentration limits, and credit support agreements</li> <li>g. Describe the role of rating agencies in evaluating credit risk</li> </ol>	
Syllabus Resources	
<ul style="list-style-type: none"> <li>• Crouhy, <i>Risk Management</i>, 2001, Chapters 7, 8-10, 12</li> <li>• FE-C147-07 (formerly 8V-114-00), Derivatives: Practice and Principles (pg. 13 – 24)</li> <li>• FE-C141-07 (formerly 8FE-411-03), Letter to SEF Regarding Fitch Ratings’ View on the Role and Function of Rating Agencies in the Operation of Securities</li> <li>• FE-C102-07 (formerly 8FE-306-01), General American Life Can’t Pay Investors</li> <li>• FE-C152-08, Chapter 13 of <i>Asset/Liability Management of Financial Institutions</i>, Tilman</li> </ul>	