

Individual Life and Annuity Life Risk Management Exam

Fall 2018/Spring 2019

Important Exam Information:

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| 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. |

Recognized by the Canadian Institute of Actuaries

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| 1. Topic: Understanding Risk Management |
| Learning Objectives |
| The candidate will understand the principles of Risk Management. |
| Learning Outcomes |
| The Candidate will be able to: <ul style="list-style-type: none">a) Define and evaluate riskb) Evaluate the role of risk management within an insurance companyc) Articulate the economic incentives for applying risk managementd) Describe how risk management techniques may be used to manage capital deployed by insurers and how they impact strategic decision making |
| Resources |
| <ul style="list-style-type: none">• LRM-100-14: The Theory of Risk Capital in Financial Firms• LRM-104-14: Rethinking Risk Management• LRM-123-15: Enterprise Risk Management, S&P, May 2013, pp. 3-28• LRM-124-15: All on the Same Train, But Heading in Different Directions, Underwood, Thompson & Ingram• LRM-125-15: Ch. 1 of Financial Enterprise Risk Management, Sweeting• 2nd Revision of Educational Note: Dynamic Capital Adequacy Test, CIA Nov 2017, pp. 4-36• ERM Specialty Guide, May 2006, Ch. 1-6• Risk Appetite: Linkage with Strategic Planning Report• Describing Risk Culture, The Actuary, Aug 2012 |

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| 2. Topic: Understanding the Various Sources of Risks |
| Learning Objectives |
| The candidate will understand the various sources of risks faced by an insurer. |
| Learning Outcomes |
| The Candidate will be able to: <ul style="list-style-type: none">a) Identify categorize and evaluate potential sources of risk in products including but not limited to mortality, morbidity and lapseb) Identify, categorize and evaluate potential sources of risk in investments including but not limited to credit risk, liquidity, equity-based exposure and asset-liability matchingc) Describe and evaluate the other risks an insurance company faces including operational, marketplace and expense risks |
| Resources |
| <ul style="list-style-type: none">• <i>The xVA Challenge</i>, Gregory, 3rd Edition, 2015<ul style="list-style-type: none">○ Ch. 7: Credit Exposure and Funding○ Ch. 10: Quantifying Credit Exposure (sections 10.4, 10.5 and 10.6)○ Ch. 17: Wrong-Way Risk• LRM-105-14: Mapping of Life Insurance Risks, AAA Report to NAIC• LRM-106-14: Moody's Looks at RM & the New Life Insurance Risks - 2000• LRM-126-15: Liquidity Risk, Saunders & Cornett, Ch. 17, pp. 493-514• A New Approach for Managing Operational Risk, SOA, 2008 |

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| 3. Topic: Measuring and Estimating Risk |
| Learning Objectives |
| The candidate will understand the important risk measurement techniques along with their uses and limitations, and be able to perform risk measurement calculations. |
| Learning Outcomes |
| The Candidate will be able to: <ul style="list-style-type: none">a) Analyze and evaluate risk measures & estimators (e.g., Value-At-Risk, Conditional Tail Expectations, etc.)b) Apply and analyze scenario and stress testing in managing risk including the calibration and setting of assumptionsc) Analyze and evaluate parameter risk |
| Resources |
| <ul style="list-style-type: none">• LRM-108-14: Study Note on Parameter Risk• LRM-111-14: Value-At-Risk: Evolution, Deficiencies and Alternatives• LRM-112-14: Stress Testing OSFI E-18• LRM-121-14: Value at Risk - Uses and Abuses• LRM-127-15: Measures of Financial Risk, Dowd, Ch. 2, pp. 19-32• LRM-129-15: Stress Testing: A Robust End-To-End Approach, GARP, Dec 2011• LRM-130-15: Diversification: Consideration on Modelling Aspects & Related Fungibility and Transferability, CRO, Oct 2013, pp. 4-14 and 19-30• How Fair Value Measurement Changes Risk Management Behavior in the Insurance Industry, SOA, 2013• Economic Scenario Work Group Report, AAA Dec 2008• Academy Interest Rate Generator: Frequently Asked Questions (FAQ), Jul 2017• Economic Scenario Generators: A Practical Guide, SOA, Jul 2016 (Executive Summary, Ch. 1, Ch. 2 and Ch. 4.1)• PBA Corner, The Financial Reporter, Mar 2013 (pp. 1 and 4-7)• Modern Deterministic Scenarios for Interest Rates, SOA, Sep 2017 (sections 2 and 6)• Summary of "Variance of the CTE Estimator", Risk Management, Aug 2008, Issue No. 13• Getting to Know CTE, Risk Management, Jul 2004, Issue No. 2 |

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| 4. Topic: Asset Liability Management |
| Learning Objectives |
| The candidate will understand the principles of modeling, cash flow testing and asset-liability matching, and perform related calculations. |
| Learning Outcomes |
| The Candidate will be able to: <ul style="list-style-type: none">a) For an ALM model:<ul style="list-style-type: none">i. Select appropriate assumptions and scenariosii. Model dynamic behavior of both assets and liabilitiesiii. Model and explain various strategies, including hedgingiv. Analyze and evaluate results (including actual v. projected differences)v. Recommend appropriate strategiesb) Define and calculate duration, convexity and key rate durations including the rationale for matching as a means to manage riskc) Evaluate the principles of Cash Flow Testing to help in understanding the underlying risks and to assess their impact on capital and surplus |
| Resources |
| <ul style="list-style-type: none">• <i>Asset Liability Integration</i>, SOA, 2002<ul style="list-style-type: none">○ Ch. 2: Defining Asset-Liability Management○ Ch. 3: Why Did ALM Become Important?• LRM-114-14: ALM for Insurers• LRM-116-14: Life Insurance Forecasting and Liability Models, exclude appendices.• LRM-117-14: Key Rate Durations: Measures of Interest Rate Risk• LRM-118-14: Revisiting the Role of Insurance Company ALM w/in a RM Framework• LRM-119-14: Chapter 13 of Valuation of Life Insurance Liabilities, Lombardi• LRM-120-14: Ch. 14 of Life Insurance Products and Finance, Atkinson/Dallas (section 14.4 only on ALM Matching) |