Principles Underlying Actuarial Science

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Quality In Everything We Do

Agenda

► Purpose of principles

► Background

► Role in articulating principles

► Organization of principles

► Discussion of examples of application and use

► Wrap-up and references

Purpose of principles

- ► Provide conceptual framework for actuaries

- ► Articulation of principles that describe key elements of actuarial science

- ► Grounded in observation, experience, and current understanding of authors

- ► Not standards to be applied when performing actuarial work

- ► Do not conflict with prior Casualty Actuarial Society (CAS) and Society of Actuaries (SOA) statements of actuarial principles that are related to more specific aspects of actuarial science or practice

Principles underlying actuarial science

Background

► Started with SOA Committee on Actuarial Principles (1992)

► CAS and SOA releases discussion draft of "General Principles of Actuarial Science" in 1997

► Led to exposure draft in 1999

► Joint CAS, SOA Committee on Actuarial Principles worked on revisions from comments to exposure draft

► Both Boards decided not to develop a statement of general principles but granted committee members permission to publish the document under their names

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Articulating the principles

► Disciplines relied upon

► Observation and fact

► Definitions – selected ones included in this presentation

► Itemization and schedule of principles

► Glossary of definitions

Principles underlying actuarial science

Organization of principles

► Statistical framework

► Economic and behavioral framework

► Principles underlying risk management and actuarial modeling

► Principle underlying financial security systems

Statistical framework – definitions

► Phenomena, experiments, observations

► Random variables, expected values, estimators and estimates

► Degree of uncertainty

► Exposure measure

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Statistical framework – principles

► Statistical regularity

► Basis for model construction

► Credibility

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Economic and behavioral framework – definitions

▶ Economic system

▶ Economic transaction

▶ Participants

▶ Economic goods

▶ Commodities

▶ Value functions

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Economic and behavioral framework – principles

► Preference or indifference

► Diversity of preferences

► Time preference

► Risk aversion

► Existence of money

► Enlightened self-Interest

► Market value models

► Law of one price

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Risk management and actuarial modeling – definitions

► Actuarial phenomenon – examples

► Actuarial risk

► Risk identification

► Actuarial model

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Risk management and actuarial modeling – principles

► Scaling

► Combination of actuarial risks

► Actuarial present value

► Continued validity of actuarial models

► Probability of failure

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Financial security systems – definitions

► Financial security system

► Risk measure

► Risk classification system

► Refinement of a risk classification system

► Rate structure

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Financial security systems – principles

▶ Risk classification

▶ Effect of refinement

▶ Anti-selection

▶ Moral hazard

▶ Actuarial soundness

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Application examples – ratemaking

▶ Classifications

▶ Exposures

▶ Credibility

▶ Refinement of a risk classification system – anti-selection, subsidies, moral hazard

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Application examples – loss reserving

▶ Statistical models

▶ Actuarial soundness

▶ Continued validity of actuarial models

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Application examples – dynamic financial analysis

► Actuarial present value

► Statistical model

► Actuarial validity

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Wrap-up and references

► CAS working paper website:
http://**www.casact.org**/research/wp/index.cfm?fa=workingpapers

► SOA Actuarial Practice Forum:

http://**www.soa.org**/library/journals/actuarial-practice-forum/2008/august/apf-2008-08-allaben.pdf

► North American Actuarial Journal – under editorial review

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