Notation and Terminology Used on Exam ASTAM

Version: Dec 6 2025

Introduction

The primary purpose of this study note is to present standard terminology to be used on the ASTAM examination for situations where (1) there are multiple ways of referring to concepts in the textbooks for the examination, (2) there is ambiguity in the textbooks for the examination, or (3) there are varying interpretations in actuarial practice. In addition, this note provides a set of abbreviations that will be utilized on the exam without additional supporting context for a limited number of terms. For terminology not discussed in this study note, the definitions in *Loss Models: From Data to Decisions* (5th edition) (*LM*) and/or *Introduction to Ratemaking and Loss Reserving for Property and Casualty Insurance* (4th edition) (*IRLR*) and/or *Quantitative Enterprise Risk Management (QERM)* and/or the *Outstanding Claims Reserves* study note will apply.

Abbreviations

AY	Accident Year
ALAE	Allocated Loss and Adjustment Expenses
CY	Calendar Year
DY	Development Year
ULAE	Unallocated Loss and Adjustment Expenses

Unless otherwise noted in a question on the examination, both Accident Years and Calendar Years are assumed to begin on January 1 and end on December 31.

Distributions

In the exam we will use the following conventions

$f(x)$ refers to a probability density function of a continuous random variable.

$p(k)$ or p_k refers to a probability function of a discrete random variable.

$F(x)$ refers to the cumulative distribution function of a random variable.

$S(x)$ refers to the survival or decumulative distribution function of a random variable.

Unless otherwise noted in a question on the examination, frequency and severity distributions are assumed to be independent.

Policy Modifications

Coinsurance can be viewed from the insurer's perspective or the insured's perspective. On this examination, the term coinsurance refers to the proportion of a loss that is paid by the *insurance company*. Under a coverage with $c\%$ coinsurance, the insurance company pays $c\%$ of the loss and the policyholder pays $(100-c)\%$.

Deductible, when used as a stand-alone term on the examination, refers to an ordinary deductible as defined in *LM* or a fixed-dollar deductible as defined in *IRLR*. Other types of deductibles will

include additional wording consistent with the definitions presented in the source material (e.g., franchise deductible).

In practice, **policy limit** can refer to either the maximum insurer payment provided under a policy or the loss (or total losses) above which no additional benefits are paid. On the examination, policy limit will refer to the maximum insurer payment provided under a policy and **maximum covered loss** will refer to the loss (or total losses) above which no additional benefits are paid.

An **excess of loss** reinsurance contract has the same form as a deductible insurance policy, except that the direct insurer covers losses up to the excess point or threshold, and the reinsurer covers losses above the excess point. There may also be a policy limit, defining the maximum amount that the reinsurer will reimburse for a single claim.

A **proportional reinsurance** contract has the same form as coinsurance. The direct insurer retains a proportion of each claim, and the reinsurer pays the rest. The most common type of proportional reinsurance is **Quota Share** reinsurance.

Outstanding Claims Reserves (OCR)
In the exam, the **Outstanding Claims Reserve** refers to the technical provision for claims that have been incurred but not settled. The Incurred But Not Reported (IBNR) reserve in this exam refers only to claims that have been incurred but not reported, which is included, implicitly or explicitly, in the OCR. In practice, but not in this exam, IBNR is sometimes used to mean all outstanding claims. Unearned premiums are not included in OCR, but are included in the **Unearned Premium Reserve**, which is a provision for future insurance cover on current contracts.

Chain ladder estimated **development factors** should be calculated using a weighted average of the individual development factors, with weights proportional to cumulative claims.

Risk Measures
The **α-Value-at-Risk** (VaR) of a loss random variable X is defined as the α-quantile of X, for $0 < \alpha < 1$. We will use the notation $Q_\alpha(X)$, or Q_α (where there is no ambiguity with respect to the loss random variable under consideration) for this measure.
The **α-Expected Shortfall, or ES_α** of a loss random variable X is defined as the expected value of X given that it lies in the upper 1-α tail of the distribution – that is

$$\mathrm{ES}_\alpha = \frac{1}{1-\alpha}\int_\alpha^1 Q_\nu \, d\nu$$

This risk measure is also known as the **Conditional Tail Expectation** (CTE) and **Tail VaR**[1].

Note that in practice the Expected Shortfall may be parameterized using $1-\alpha$ instead of α, for example using the term "5% ES" instead of 95% ES, to refer to the expected loss conditional on

[1] The original definition of TailVaR in Artzner et al (1999) is slightly different from ES and CTE in the case where the α-quantile lies in a probability mass, but in contemporary common usage the terms all refer to the same measure.

being in the top 5% of the loss distribution. In the exam, we will always use the latter convention.

Excel

The ASTAM exam will not use statistical tables for standard distributions.
Instead, candidates are expected to use the provided Excel workbook to determine required values.
Candidates should be able to perform simple row and column operations in Excel, and should be familiar with the Excel functions used to determine probabilities and quantiles (inverse distribution function values) for the following distributions:

- **Normal**
- **Binomial**
- **Poisson**
- **Chi-Squared**
- **Negative binomial**

  Note the slightly different parametrization in Excel compared with Loss Models. Specifically, Excel uses a parameter p in place of the β parameter in LM, where $p = \frac{1}{1+\beta}$.
- **Gamma**
- **F**
- **Lognormal**

Candidates are also expected to be able to use the Excel **Goal Seek** function, and to be able to use Excel to create simple plots and graphs.

Other functions that are not required, but may be useful, include **sumproduct** and the matrix multiplication and inverse functions.