



# Estimation of conditional mean squared error of prediction for claims reserving

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December 2018

## Abstract

This paper studies estimation of conditional mean squared error of prediction, conditional on what is known at the time of prediction. The particular problem considered is the assessment of actuarial reserving methods given data in the form of runoff triangles (trapezoids), where the use of prediction assessment based on out-of-sample performance is not an option. The prediction assessment principle advocated here can be viewed as a generalization of Akaike's final prediction error. A direct application of this simple principle in the setting of a data generating process given in terms of a sequence of general linear models yields an estimator of conditional mean square error of prediction that can be computed explicitly for a wide range of models within this model class. Mack's distribution-free chain ladder model and the corresponding estimator of the prediction error for the ultimate claim amount is shown to be a special case. It is demonstrated that the prediction assessment principle easily applies to quite different data generating processes and results in estimators that have been studied in the literature.

**Keywords:** Mean squared error of prediction; Reserving methods; Prediction error; Estimation error; Ultimate claim amount; Claims development result; Chain ladder method.

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**N.B.** This is a revised version of the technical report 2018:6 "*Estimation of conditional mean squared error of prediction for claims triangle reserving*" from January 2018.

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