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Pure Robust Versus Robust Portfolio Unbiased - Credibility and Asymptotic Optimality

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Abstract

Empirical credibility estimation, which is a credibility counterpart of empirical Bayes estimation lacks of robustness due to sensitivity of estimators to outlier events. In this paper we combine robust statistics with empirical linear Bayes estimation and derive robust asymptotic optimality based on Norberg's (1980) proposal. Robust portfolio-unbiased empirical regression credibility is derived and its asymptotic optimality is proved, under not very restrictive assumptions. The asymptotic optimality of pure robust credibility estimators is also proved. The superiority of the pure robust credibility estimation against the robust portfolio-unbiased credibility estimation is presented and verified with numerical results.

Keywords: empirical credibility; portfolio-unbiasedness; pure robust; pseudo-observations; asymptotic optimality.

1 Introduction

Credibility is a ratemaking technique predicting future premiums for a group of insurance contracts for which we have some claim experience for that group

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