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Weighted allocations, their concomitant-based estimators, and asymptotics

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Abstract Various members of the class of weighted insurance premiums and risk capital allocation rules have been researched from a number of perspectives. Corresponding formulas in the case of parametric families of distributions have been derived, and they have played a pivotal role when establishing parametric statistical inference in the area. Nonparametric inference results have also been derived in special cases such as the tail conditional expectation, distortion risk measure, and several members of the class of weighted premiums. For weighted allocation rules, however, nonparametric inference results have not yet been adequately developed. In the present paper, therefore, we put forward empirical estimators for the weighted allocation rules and establish their consistency and asymptotic normality under practically sound conditions. Intricate statistical considerations rely on the theory of induced order statistics, known as concomitants.

Keywords Weighted allocation · Insurance premium · Concomitant · Consistency · Asymptotic normality

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