Summary: This paper is devoted to two different two-time-scale stochastic approximation algorithms for superquantile, also known as conditional value-at-risk, estimation. We shall investigate the asymptotic behavior of a Robbins-Monro estimator and its convexified version. Our main contribution is to establish the almost sure convergence, the quadratic strong law and the law of iterated logarithm for our estimates via a martingale approach. A joint asymptotic normality is also provided. Our theoretical analysis is illustrated by numerical experiments on real datasets.

MSC:
- 62L20 Stochastic approximation
- 62G08 Nonparametric regression and quantile regression
- 60F05 Central limit and other weak theorems
- 62P05 Applications of statistics to actuarial sciences and financial mathematics

Keywords:
- conditional value-at-risk; limit theorems; quantile and superquantile; stochastic approximation

Full Text: DOI

References:


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