

**NONPARAMETRIC INFERENCE OF VALUE AT RISK FOR  
DEPENDENT FINANCIAL RETURNS**

by

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ABSTRACT

The paper considers nonparametric estimation of Value at Risk (VaR) and associated standard error estimation for dependent financial returns. Theoretical properties of the kernel VaR estimator are investigated in the context of dependence. The presence of dependence affects the variance of the VaR estimates and has to be taken into consideration in order to obtain adequate assessment of their variation. An estimation procedure of the standard errors is proposed based on kernel estimation of the spectral density of a derived series. The performance of the VaR estimators and the proposed standard error estimation procedure are evaluated by theoretical investigation, simulation of commonly used models for financial returns, and empirical studies on real financial return series.

**KEY WORDS:**  $\alpha$ -mixing; kernel estimation; sample quantile; spectral density estimation; standard error estimation.