



THE UNIVERSITY OF
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Department of Statistics

MASTER'S THESIS PRESENTATION

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Kernel Estimation of A Conditional Quantile and Its Application to
Conditional VaR

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ABSTRACT

Conditional quantile is widely used in risk management in that it offers a way to look at what the losses might be in the tails of the distribution. In this paper, a kernel estimator of conditional quantile is advised for both short-range and long-range dependent processes. In order to study the asymptotics of the kernel conditional quantile estimator, Bahadur representations and central limit theorems are obtained for these processes under mild regularity conditions. In particular, we propose a bandwidth selection rule and a bias correction scheme for the kernel estimator. To evaluate the performance of the kernel estimator and its application to conditional VaR, we perform a simulation study for ARCH and stochastic volatility (SV) models that are widely used in modeling financial time series. This kernel estimation method works well when being used to calculate conditional VaR in empirical data analysis.

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