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# Estimating and Backtesting Risk Measures

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MASTER'S THESIS

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SCIENCE IN QUANTITATIVE FINANCE

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## **Executive Summary**

In this article, first of all, I introduce the basic idea of risk. In second part, I introduce the idea and formula of Value-at-Risk and Expected Shortfall. In third part, I use three methods to estimate VaR and ES. In detail, they are analytical method, historical simulation method and Monte Carlo method. Then I try to backtest my estimation by two method:score function method and violation test method. In the last part, I construct a loss operator and filfill my plan above. based on the real data, I try to draw some conclusions for VaR and ES estimators.