Bachelorseminar Finanzmarktmodellierung
Themen im SoSe19

1 Credit Card Clients and their Probability of default

In recent years, financial institutions over-issued credit cards to unqualified customers leading to high accumulated credit card debts and crisis. From the perspective of risk management, uncertainty about the repayment ability of credit card users is crucial. On a given dataset you are modeling the probability of default of credit cardholders taking over 30,000 observations into account. Which variables are significantly being the strongest predictors of customer default? Before, you shed light on the literature dealing with probability of default in the context of credit card holders.

2 Volatility Asset Management

In this topic you give an introduction to GARCH models in finance. Further, you construct a dataset containing daily stock prices of constituents of the S&P500. Fit a GARCH model to the data and evaluate the in-sample and out-of-sample performance. Finally construct a portfolio which invests in the stock market when the volatility in the stock market is low. Evaluate the out-of-sample performance based on the Sharpe ratio.

3 Nonparametric methods

First, give a brief introduction to nonparametric methods. A good start might be Li und Racine (2007). Use a nonparametric approach to estimate the probability of default of different companies on a real dataset.

4 Crypto Assets

In this topic you give an introduction to price efficiency and a brief description of the crypto-market. Construct a dataset which contains of several crypto-currencies and perform different price efficiency tests to test your hypotheses.

5 Trader's Overconfidence

As a common feature of human existence, learning about our own abilities by observing the consequences of our actions is usual. For most people and also for traders, there is an attribution bias to this kind of learning: trader tend to overestimate the degree to which they are responsible for their own successes. In this topic you are examining the overconfidence of traders. Start might be Gervais und Odean (2001).

6 Financial Fraud Detection

Economically, financial fraud is becoming a serious problem. A striking case is the Ponzi scheme perpetuated by Bernard Madoff, former NASDAQ chairman, which has led to the loss of around US$50 billion worldwide. For this topic you examine several data mining techniques to detect financial fraud. Start might be Ngai u. a. (2011).

7 Asian Option Pricing

Give an introduction to the characteristics of Asian options and its pricing methods. In this context perform a Monte Carlo simulation to price a fictional Asian option.

8 Credit Valuation Adjustment

Since the default of Lehman in 2008, the most important measure of counterparty credit risk (ccp) –credit valuation adjustment has become central part of pricing derivatives. Neglecting counterparty credit risk in the pricing of derivatives is being considered as one cause of the financial crisis in 2007. You give a short introduction on historical development and regulatory framework of CVA's and then focus on the computing CVA's in practice. Propose a simplified example of pricing a CVA. Start might be Green (2015).

9 Filtered Historical Simulation

Here you are examining the concept of filtered historical simulation to estimate the Value at risk. Perform the well known historical simulation compare it to the filtered historical simulation to estimate the VaR on several companies. Propose strategies to back test your estimation methods. Start might be Gurrola-Perez und Murphy (2015).

10 Performance Measures

In order to evaluate the performance of a fund there is a bunch of performance measures existing. Examine the rank correlation between these on a real dataset and answer the question whether investment decisions can be made only based on the Sharpe ratio.

Literatur

Gervais, Simon und Terrance Odean (2001). "Learning to be overconfident". In: *the Review of financial studies* 14(1), S. 1–27.

Green, Andrew (2015). *XVA: Credit, Funding and Capital Valuation Adjustments*. John Wiley & Sons.

Gurrola-Perez, Pedro, David Murphy u. a. (2015). *Filtered historical simulation Value-at-Risk models and their competitors*. Techn. Ber. Bank of England.

Li, Qi und Jeffrey Scott Racine (2007). *Nonparametric econometrics: theory and practice*. Princeton University Press.

Ngai, Eric WT u. a. (2011). "The application of data mining techniques in financial fraud detection: A classification framework and an academic review of literature". In: *Decision support systems* 50(3), S. 559–569.