Technische Universität München

Module Description

MA4706: Portfolio Analysis

TUM Department of Mathematics

Module level:	Language:	Module duration:	Occurrence:
Master	English	one semester	summer semester

Credits*:	Total number of hours:	Self-study hours:	Contact hours:
6	180	120	60

* The number of credits can vary depending on the corresponding SPO version. The valid number is always indicated on the Transcript of Records or the Performance Record.

Description of achievement and assessment methods:
The module examination is based on a written exam (60-90 minutes). It is examined how deep students understand the theoretical fundamentals of Portfolio Optimization and Analysis and whether they are familiar with the capital asset pricing model, its applications and risk measures as well as whether they are able to implement portfolio optimizations numerically.

Exam type:	Exam duration (min.):	Possibility of re-taking:	Homework:
written	60-90	In the next semester: No At the end of the semester: Yes	No

Lecture:	Conversation:	Written paper:
No	No	No

(Recommended) requirements:
MA2504 Fundamentals of Convex Optimization

Contents:
Asset Classes, Mean Variance Theory, Portfolio Selection, Index Models, Arbitrage Pricing Theory, Capital Asset Pricing Model (CAPM), Alternative Risk Measures, Risk Adjusted Performance Measures, Integration of Expert Forecasts, Reverse Optimization, Quantitative Fund Ranking

Study goals:
At the end of the module the student is able to understand the fundamentals of Portfolio Optimization and Analysis. He is familiar with the seminal work of Harry Markowitz on mean-variance theory. The student understands the theoretical background and practical impact of efficient portfolios and the capital asset pricing model. He also knows the most important risk measures and is able to evaluate and manage portfolios according to their risk-return profiles. Case Studies and examples in the lecture or in the (computer) exercises give a further insight into the concepts of portfolio analysis used in the investment industry.

Teaching and learning methods:
The module consists of the lecture supplemented by an exercise session. The lecture material is presented with slide presentations and mathematical proofs are presented on the blackboard. The students are encouraged to study course references and course subjects. The exercise session consists of theoretical and computer-oriented exercises. In the theoretical exercises students will work under instructor assistance on assignments, sometimes in teamwork. In computer-oriented exercises students simulate price processes of financial assets and determine optimal portfolios. The exercises contribute to a better understanding of the lecture materials.

Media formats:
blackboard, assignments, computer-oriented exercises

Literature:
E.J. Elton and M.J. Gruber (1991): Modern Portfolio Theory and Investment Analysis; John Wiley & Sons.
H. Uhlir and P. Steiner (2001): Wertpapieranalyse, Physica-Verlag.
Rubinstein, Mark (2006): A History of the Theory of Investments. Hoboken: John Wiley & Sons, Inc.
Jean-Pierre Danthine and John B. Donaldson (2005): Intermediate Financial Theory, 2nd (Academic Press Advanced Finance).
Interessante Internet Seiten von Sharpe:
http://www.stanford.edu/~wfsharpe/art/art1.htm
http://www.stanford.edu/~wfsharpe/mia/mia.htm

Responsible for the module:
Zagst, Rudi; Prof. Dr.: zagst@tum.de

Courses (Type, SH) Lecturer:

0000001036 Portfolio Analysis (Programming Practical) [MA4706] (1SWS P, SS 2016/17)
Zagst R, Sloot H

0000001723 Portfolio Analysis [MA4706] (2SWS L, SS 2016/17)
Sloot H [L], Zagst R

0000001724 Portfolio Analysis (Exercise Session) [MA4706] (1SWS P, SS 2016/17)
Zagst R, Sloot H

For further information about this module and its allocation to the curriculum see:
https://campus.tum.de/tumonline/wbModHb.wbShowMHBReadOnly?pKnotenNr=709807

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