

FINANCIAL RISK MEASURES

Risk measures are set to quantify in terms of assets/money the amount of financial risk associated to a certain financial position. The purposes for such evaluations are many and interesting both from the investors perspectives and regulators. As example, these evaluations are important to quantify the amount of reserve that financial institutions, such as banks or insurance companies, have to set aside as hedging guarantee. In the recent years large attention is given towards convex and coherent risk measures.

A series of 10 lectures will be held by Prof. Giacomo Scandolo, Department of Mathematics, University of Verona (Italy), visiting scholar at our department.

Schedule:

Tuesday March 4, 2014: Nils Hendrik Abel's hus, Seminarrom B63 at 9:15-12:00 and 13:15-15:00

Wednesday March 5, 2014: Nils Hendrik Abel's hus, Seminarrom B1063 at 9:15-12:00 and 13:15-15:00

The course is suggested to Master and PhD students in the area of Stochastic Analysis, Insurance, and Risk as well as practitioners in the area.

For those interested in having this course as part of the study plan, then the lectures can be completed of a second part in self-reading format on a specific deepening in the subject following the literature given below.

If you want to take the exam for this course, please talk to your supervisor and make sure you have the course in your study plan. The course counts 10 credits. The exam (passed/fail) will be oral with date organized by appointment.

Registration to the course is free, but for organizational purposes, please send an email to: giulian@math.uio.no

Program for PART I: lectures

1. The problem of risk quantification
2. Value-at-Risk, Expected Shortfall and other risk measures
3. Risk estimation with a single risk factor: univariate distributions of risk factors, normal and fat-tailed distributions, (univariate) delta and delta-gamma methods
4. Risk estimation with multiple risk factors: multivariate distributions of risk factors, (multivariate) normal, spherical and elliptical distributions, (multivariate) delta method
5. Coherent risk measures: definition, examples and dual representation
6. Portfolio optimization with risk measures

Program for PART II: self-reading

7. Deepening on the topics of Part I
8. Backward stochastic differential equations (BSDEs), linear BSDEs, comparison of BSDEs
9. g-expectations
10. Dynamic risk measures

Readings and associated literature

[EFM] "Quantitative Risk Management", Embrechts P., Frey R., McNeil A., Princeton University Press (2005). Chap 1, 2, 3 (only Sect 3.1 and 3.3), Sect 6.1

[JPR] "Financial modelling under non-Gaussian distributions", Jondeau E., Poon S., Rockinger M., Springer Finance (2007). Sect 2.1, 2.2, 3.2, Chap 8, Sect 9.2

[FS] "Stochastic Finance" (3rd Ed), Foellmer H., Schied A., de Gruyter (2011). Some parts of Chap 4

[RG] "Risk measures via g-expectations", Rosazza-Gianin, E., Insurance Mathematics and Economics, 39 (2006), 19-34

[P] "Continuous-time Stochastic Control and Optimization with Financial Applications", Pham, H., Springer 2009 Chap 6.

Additional notes will be provided on some topics.

Reference lecturers

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