



Aalto University
School of Science

MS-E2114 Investment Science

Course practicalities

A. Salo, T. Seeve

Systems Analysis Laboratory
Department of System Analysis and Mathematics
Aalto University, School of Science

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Why this course on investment science?

- ▶ Investments are important
 - ▶ Should I invest my time in taking this course?
 - ▶ Is the investment into Company X be a “good” one?
- ▶ A growing range of application fields
 - ▶ Banking, finance, insurance
 - ▶ Energy, environment, healthcare
 - ▶ Construction, transportation, retail
 - ▶ “Securitization” is an ongoing trend
- ▶ There is a strong demand for skills taught in this course
 - ▶ Financial investment analysts
 - ▶ Energy market specialists
 - ▶ Market intelligence
- ▶ This course gives a broad introduction into quantitative approaches for taking informed decisions about financial investments

Why might you wish to study investment science?

- ▶ You may rise to professional positions where you are responsible for your employer's investment decisions
- ▶ You may wish to manage your own finances well
 - ▶ How should you invest your own money?
 - ▶ How should you evaluate possible loan offers?
- ▶ Society needs people who understand investments
 - ▶ See e.g. <http://www.investopedia.com/ask/answers/052715/how-big-derivatives-market.asp>

What will you understand better?

yle UUTISET KIRJAUDU HAE VALIKKO

Uutiset

UUTISET > POLITIIKKA



Politiikka 23.2.2016 klo 6:11

Valtion Talvivaara-bisneksen pohjana ollut nikkelin hintaennuste romahti

Valtion Terrafame-yhtiön liiketoimintasuunnitelman lähtökohtana ollut nikkelin hintaennuste on romahtanut peräti 15 prosenttia. Yhtiö sanoo pitävänsä suunnitelmansa ennallaan. Talvivaara-analyytikko pitää yhtiön selityksiä "hölynpölynä".

Related courses at Aalto SCI

- ▶ TU-E2210 - Financial Engineering I
 - ▶ Is less theoretical and more focused on finance
 - ▶ Covers comparable topics
- ▶ MS-E2177 Seminar on Case Studies in Operations Research
 - ▶ Teams of 3-5 students solve problems proposed by clients
 - ▶ Problems proposed by firms such as Nordea, OP Group, Danske Bank, Evli, ModelIT, ...
- ▶ MS-E2142 Seminar on Optimization
 - ▶ Covers timely topics in systems and operations research
 - ▶ Past courses on real options, portfolio decision analysis, quantitative risk management, for instance
- ▶ Numerous BSc, MSc and Doctoral Theses
 - ▶ See <http://sal.aalto.fi/en/publications/theses>

Overview

- ▶ Course personnel
 - ▶ Lecturer: Prof. Ahti Salo
 - ▶ Office hours on Wednesdays 13-14 in Y217 (Otakaari 1)
 - ▶ <http://sal.aalto.fi/ahti>
 - ▶ Assistant: Teemu Seeve
 - ▶ Primary contact for course practicalities
 - ▶ Emails: firstname.lastname@aalto.fi
- ▶ Lectures
 - ▶ Mondays at 10.15-12.00 in lecture hall U5
- ▶ Exercises
 - ▶ Thursdays at 10.15-12.00 in Y344
- ▶ Course material
 - ▶ David G. Luenberger (1998 1st ed.; 2013 2nd ed.)
Investment Science, Oxford University Press, New York.
 - ▶ Lecture slides, exercises + solutions

Lecture schedule

1. Cash flow analysis (11.9.) [Ch. 1+2]
2. Fixed income securities (18.9.) [Ch. 3]
3. Term structure of interest rates (25.9.) [Ch. 4]
4. Applied interest rate analysis (2.10.) [Ch. 5]
5. Modern portfolio theory (9.10.) [Ch. 6]
6. Capital Asset Pricing Model (16.10.) [Ch. 7]
7. Arbitrage Pricing Theory (30.10.) [Ch. 8+9]
8. Derivative instruments (6.11.) [Ch. 10]
9. Basic options theory (13.11.) [Ch. 11+12]
10. Options pricing (discrete) (20.11.) [Ch. 12]
11. Options pricing (continuous) (27.11.) [Ch. 13]
12. Interest rate derivatives (4.12.) [Ch. 14]

Grading

- ▶ 5 ECTS course, grading 0-5
- ▶ Exam max 30 p = 75 %
 - ▶ Only standard calculator permitted
 - ▶ 20 December 2017 at 13:00-16:00
 - ▶ 4 April 2017 at 13:00-16:00
- ▶ Assignments & Exercises max 10 p = 25 %
 - ▶ 8 homework problems
 - ▶ 16 demonstration problems in Exercises
 - ▶ Points valid until the end of November 2018
- ▶ Guest lectures
 - ▶ One additional bonus point given
 - ▶ Name of the lecturer will be announced later

Acknowledgements

- ▶ Slides by Ahti Salo, with modifications by Teemu Seeve, Antti Toppila, Jussi Kangaspunta, Pekka Mild and Ville Brummer
- ▶ Exercises materials by Teemu Seeve, Ahti Salo and Janne Gustafsson
- ▶ Course content can be found in book David G. Luenberger (1998 1st edition, 2013 2nd edition) *Investment Science* Oxford University Press, New York.