Course Description

This course concentrates on building financial models for portfolios and derivatives valuation models. The classes will be directed towards applying the theory of finance in building implementable models, with Excel used as a programming vehicle.
### Classes will be interactive—use your laptop during lectures!

<table>
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<tr>
<th>Week</th>
<th>Topic</th>
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| 1-2  | **Technical topics:**  
• Data tables in Excel  
• Introduction to VBA  
• Portfolio choice: Introduction | FM, Ch. 31: Data tables  
FM, Ch. 34: Array functions  
FM, Ch. 8: Introduction to portfolios  
Adding formulatext |
| 3-4  | **Portfolio choice**  
Efficient portfolio theorems  
Constructing efficient portfolios  
In class exercise: constructing efficient portfolios | FM, Ch. 9: Efficient portfolio theorems |
| 5-6  | **Building variance-covariance matrices**  
Testing the CAPM | FM, Ch. 10: Variance-covariance matrices  
FM, Ch. 11: SML testing |
| 7-8  | **The Black-Litterman model** | FM, Ch. 13: Black-Litterman |
| 9-10 | **Monte Carlo simulations**  
• Introduction to Monte Carlo  
• Lognormality—generating price simulations  
• Introduction to VaR | FM4, Chapter 25  
FM4, Chapter 26  
FM4, Chapter 27 |
| 11-12| **Options pricing**  
• Black-Scholes  
• The binomial model  
• Monte Carlo for options  
• Structured securities? | FM4, Ch. 15: Option intro.  
FM4, Ch. 17: Black-Scholes  
FM4, Ch. 16: Binomial model  
FM4, Ch. 29 and 30  
FM4, Ch. 17 |
Course Goals

At the end of the course, students should be able to:

1. Understand how to implement portfolio theory to better manage investments,
2. Implement the Black-Litterman model to find implied expected returns,
3. Perform Monte-Carlo simulations,
4. Understand how to model stock prices and,
5. How to price complex path-dependent derivatives.

Grading

The course grade is based on a bi-weekly assignment (done in groups of 2-3 students) and an open-book final take-home examination.

Class-participation and assignments count for 10% of the grade and the exam counts for 90%.

Lecturer Office Hours

before or after class - please coordinate by mail.

Teaching Assistant

Sagi Haim

Reading List

We will use chapters from Professor Benninga’s book:


we will also use the new materials that I am currently developing.