Portfolio management

G. Rabault

Course : 18 hours - TP : 0 hours

Objectives

In the first part, the objective of this course is to present recent advances in financial research in the field of portfolio allocation, with a view to showing to what extent this work provides a clear formalism adapted to the reality of financial markets. The theoretical results will be presented and then applied systematically. A special effort will be made to analyse the orders of magnitude involved. In a second step, portfolio optimization will be revisited from the practitioner's point of view. Finally, the main features of the asset management industry will be examined.

Outline

- Multi-varied single-period allocation: Traditionally, portfolio management is conceived as a choice between several risky securities, intended to be held on a long-term basis. This approach was initiated by the work of Tobin (1958), Markowitz (1959) and Sharpe (1964). This approach carries a number of important messages and introduces the essential elements of portfolio choices.
- Dynamic optimal strategy: Single-period portfolio management provides many robust but, all in all, very partial lessons. The criteria selected do not allow for the integration of either the existence of option markets or, of course, more complex strategies than buying and waiting. It is therefore necessary to propose a formulation and a resolution of the problem of the same nature as that obtained in discrete time. Two approaches are possible. The first, developed by Samuelson (1969) and Merton (1998), consists in explicitly searching for the portfolio strategy using optimal control methods. The results directly extend those obtained in discrete time and confirm their relevance.
- Portfolio allocation as option selection : The second approach initiated by Cox and Huang (1989) then formalised by Karatzas, Lehocky and Shreve (1991) and Schachermayer (2001) does not optimise on all possible strategies but, in a dual way, on all the terminal profits that the investor can expect. This approach makes explicit the importance of options markets since, in this framework, the choice is made between all possible existing options, under budget constraints. The portfolio strategy is then characterized as the delta of the option considered.
- Portfolio optimisation in practice: leverage, risk measurement, performance estimation, portfolio sensitivity, Bayesian approach, Black-Litterman, asset/liability portfolios, value strategies, anomalies etc.
- The Asset Management industry: third party asset management, pension funds, mutual funds, hedge funds, proprietary trading etc.

Bibliography

- COX J.C. and HUANG C. (1989) : *Optimum consumption and portfolio policies when asset prices follow a diffusion process*, Journal of Economics Theory, 49, 33-83.
- KARATZAS I., LEHOSKY J.P. and SHREVE S. (1991) : *Martingale and duality methods for utility maximization in an incomplete market*, SIAM Journal on Control and optimization, 29, pp 702-730.
- MERTON R. (1998) : *Continuous time finance*, Blackwell Publishers.
- SCHACHERMAYER, W. (2001) : *Optimal investment in incomplete financial markets*, Mathematical Finance: Bachelier Congress 2000, Springer, pp 427-462.