

Risk - Management

Lecturer: Prof. Dr. Rainer Stöttner, Kassel University, Germany

Course Objectives

As a first step, the course will give an introduction to the concepts of risk and techniques of avoiding risk. Relevant risk concepts will be embedded in two main pieces of theory, viz. in the microeconomic version of portfolio theory as originally presented by Harry M. Markowitz, and Capital Asset Pricing Theory, as originally put forth by William F. Sharpe, John Lintner and Jan Mossin. For that reason, the fundamental concepts of portfolio theory will be outlined. Students will learn how to define opportunity sets, efficient sets and portfolio optimality. At the same time the principles of risk reduction and risk elimination by means of diversification of asset holdings will be conveyed. The practical as well as theoretical shortcomings of the Markowitz model will be discussed thus widening the scope for studying capital market conditions and implications in a general equilibrium setting, the Capital Asset Pricing Model (CAPM). A risk-free asset will be introduced, thus substituting the efficient set curve by an efficient set line, the so called Capital Market Line (CML). Portfolio optimality will have to be defined in a more complex way. Discussion will encompass also the Security Market Line (SML), defining security returns as a linear function of systematic risk, and the Characteristic Line (CML), showing the dependence of security returns on market returns. The CAPM has shown that (total) risk can be subdivided meaningfully in systematic risk and unsystematic risk, the former being priced by capital markets in terms of a risk premium, the latter being eliminated by effective portfolio diversification. Thus, costly hedging can only be aimed at systematic risk. Before embarking on standard methods of hedging, it will be shown that capital market activities result from a variety of motives, hedging being only one of them. Other motives are gains from arbitrage and gains from speculation. Methodological problems and instruments of hedging will thereafter be broadly discussed beginning with hedging by means of options. The basic transactions will be studied with respect to their pay-off characteristics. In addition a short overview of complex options and the pricing of options will be given. Other derivative instruments will be discussed, concentrating on forwards, futures and swaps. The rationale behind hedging will be demonstrated by handling concrete hedging situations.

Knowledge and skills after completing the course

On completing the course students will be able to understand, handle and manage capital market risk. More specifically, they will be able to cope effectively with the risk of price change in stock markets, bond markets, foreign exchange markets, commodity markets and related asset markets. They will be able to handle risk not only from a technocratic point of view but from a deep theoretical understanding of the origins and underpinnings of asset market risk. Thus, students will also be able to draw a delineatory line between insurable risk and non-insurable risk that has to be managed by appropriate hedging activities on capital markets.

Course format and teaching methods

Students will be instructed primarily on a lecture basis. Preparation and elaboration of the subject is expected to occur by reading the assigned text material. Active knowledge perception and acquisition will be fostered by entering into dialogue with students trying to answer questions specifically aiming at repeating and deepening the understanding of crucial aspects. Moreover, students should feel free to engage in a question/answer dialog during the lecturing phase whenever helpful. Moreover, a catalogue of questions and case studies will be handed out to students in order to encourage proficiency studies on an auto-didactic basis.

Integration of Theory with Practice; Relationship with other Courses

Practical implementation of financial methods and instruments is shown on the basis of a profound theoretical understanding. Thus, a "firewall" against unreflected activism is installed. At the same time the linkages between theory and practice get tangible by exploring them on the basis of well-suited examples. Hereby the connections with other fields of industrial management are tentatively explored.

Course content

- 1 Introduction to the concepts of risk
- 2 Elements of Portfolio theory
- 3 Elements of Capital Asset Pricing Models
- 4 Hedging of Systematic Risk through Derivatives

Exam

Regularly written exam. In addition written homework and presentation.

Reading list

Bodie, Zvi: Investments, McGraw Hill, 2001.
Markowitz, Harry: Portfolio Selection. Efficient diversification of Investments; John Wiley, New York 1959.
Sharpe, William F., Alexander, Gordon J., Bailey, Jeffery V.: Investments, Prentice-Hall, Englewood Cliffs, N.J., 1998.
Stöttner, Rainer: Investitions- und Finanzierungslehre. Eine praxisorientierte Einführung mit Fallbeispielen, Frankfurt am

Main/New York, 1998.