

## Real Option (RO)

**Engelbert Dockner (VGSF)**

Email: [engelbert.dockner@univie.ac.at](mailto:engelbert.dockner@univie.ac.at)

Website: <http://homepage.univie.ac.at/engelbert.dockner/>

### Course Description:

This course introduces students to the techniques, tools and applications of real options. It is demonstrated that real options are a perfect tool to analyze problems in corporate finance, asset pricing and industrial organizations. The following topics will be covered in the course:

Characteristics of real options

- Introduction to mathematical foundations of real options
- Solving real option problems: Dynamic programming approach
- Solving real option problems: Contingent claims approach
- Options to wait
- Real options and asset pricing
- Strategic exercise of options

### Time schedule:

Wed,	Nov 08,	16:00-19:00; HS II
Mon,	Jan 15,	09:00-12:00; SZ VI
Tue,	Jan 16,	09:00-12:00; SZ VI
Mon,	Jan 22,	09:00-12:00; SZ VI
Tue,	Jan 23,	15:00-18:00; SZ VI
Mon,	Jan 29,	09:00-12:00; SZ VI <b>!ADDITIONAL UNIT!</b>

### Literature:

A.K.Dixit and R.S. Pindyck, Investment under uncertainty. Princeton 1994.

L. Trigeorgis, Real Options. MIT Press 2000.

M. Amram and N. Kulatilaka, Real Options, Harvard Business School Press, 1999.

### Location:

Institute for Advanced Studies, Vienna  
1060, Stumpergasse 56

### Examination:

There will be homework assignments and a final exam. The mark on the final exam will be worth 50 % of the final grade for this course.

**Final Exam, Fri, Feb 16, 2007 14.30 in Seminarroom 7, Schottenfeldg. 29**

### Course Material/Detailed Reading List:

#### Characteristics of real options:

A.K.Dixit and R.S. Pindyck, Investment under uncertainty. Princeton 1994. Chapter 1

L. Trigeorgis, Real Options. MIT Press 2000. Chapter 1, 2

Introduction to mathematical foundations of real options: T. Björk, Arbitrage Theory in Continuous Time. Oxford University Press, 1998.

S.N. Neftci, An Introduction to the Mathematics of Financial Derivatives. Academic Press, 1996.

**Solving real option problems:**

Dynamic programming approach

E.J. Dockner, S. Jorgensen, N.V. Long, and G. Sorger, Differential games in economics and management science. Cambridge University Press, 2000.

A.K. Dixit and R.S. Pindyck, Investment under uncertainty. Princeton 1994. Chapter 2&3.

A.K. Dixit, The Art of Smooth Pasting. Harwood Academic Publishers, 1993.

A.K. Dixit, A simplified treatment of the optimal regulation of Brownian motion. Journal of Economic Dynamics and Control 15, 1991, 657-673.

B. Dumas, Super contact and related optimality conditions. Journal of Economic Dynamics and Control 15, 1991, 675-685.

**Solving real option problems:**

Contingent claims approach

A.K. Dixit and R.S. Pindyck, Investment under uncertainty. Princeton 1994. Chapter 2&3.

M. Brennan and E. Schwartz, Evaluating natural resource investments. Journal of Business 58, 1985, 135-157.

M. Brennan, The pricing of contingent claims in discrete time models. Journal of Finance 34, 1979, 53-68.

**Options to wait:**

R. McDonald and D. Siegel, The value of waiting to invest. Quarterly Journal of Economics 101, 1986, 707-727.

S. Titman, Urban land prices under uncertainty. American Economic Review 75, 1985, 505-514.