



The Swedish House of Finance (SHoF) offers within its Doctoral Course Program in Finance a course in

## Continuous Time Finance

with

Prof. Tomas Björk (SSE)

The object of this course is to provide an introduction to continuous time finance, including arbitrage theory, stochastic optimal control theory, and dynamic equilibrium theory. The course also contains an introduction to stochastic differential equations and Itô calculus, which are the main mathematical tools used in this field of research. The precise contents are as follows:

**Mathematics:** Stochastic calculus; dynamic programming in continuous time.

**Arbitrage Theory:** The Black-Scholes model and the PDE approach to pricing and hedging; the martingale approach to pricing and hedging for general models; change of numeraire and interest rate theory.

**Optimal Investment Theory:** The Merton fund separation theorems; the martingale approach to optimal investment problems.

**Equilibrium Theory:** The basic production and endowment equilibrium models in continuous time.

**Readings:** Lecture notes on equilibrium theory and Chapters 1-17, 19-20, 22-26 of Björk, T: "Arbitrage Theory in continuous Time" 3:rd Ed. Oxford University Press (2009).

**Schedule:** Classes will be held at the premises of SHoF, Drottninggatan 98, 111 60 Stockholm on the following days:

Monday 21 November, 10-12 and 13-15.  
Tuesday, 22 November, 10-12 and 13-15.  
Wednesday, 23 November, 10-12 and 13-15.  
Thursday, 24 November, 10-12 and 13-15.  
Monday 5 December, 10-12 and 13-15.  
Tuesday 6 December, 10-12 and 13-15.  
Wednesday, 7 December, 10-12 and 13-15.  
Thursday, 8 December, 10-12 and 13-15.

### Registration

Please register in advance with the course secretary Jenny Wahlberg Andersson, Department of Finance, Stockholm School of Economics, Drottninggatan 98, 111 60 Stockholm, Phone: 736 9140, e-mail: [jenny.wahlberg.andersson@hhs.se](mailto:jenny.wahlberg.andersson@hhs.se)

There is the possibility for PhD students to receive funding for travelling expenses. To apply, please send a brief motivation letter/mail by the supervisor and a budget to [jenny.wahlberg.andersson@hhs.se](mailto:jenny.wahlberg.andersson@hhs.se)