



INSTITUT DE FINANCE MATHÉMATIQUE DE MONTRÉAL

## WORKSHOP IN FINANCE

in collaboration with  
UQAM

### **ECONOMETRIC MODELLING IN FINANCE AND INSURANCE WITH THE R LANGUAGE February 15, 2013**

**Arthur Charpentier  
Professor  
UQAM**

#### *Overview*

**This is an introductory seminar on the R language, and possible use of simple R functions in econometric modelling, in finance and insurance.**

As explained in the New York Times<sup>1</sup> "R is the name of a popular programming language used by a growing number of data analysts inside corporations and academia. It is becoming their lingua franca partly because data mining has entered a golden age, whether being used to set ad prices, find new drugs more quickly or fine-tune financial models. Companies as diverse as Google, Pfizer, Merck, Bank of America, the InterContinental Hotels Group and Shell use it." More precisely "R is really important to the point that it's hard to overvalue it," said Daryl Pregibon, a research scientist at Google, which uses the software widely. "It allows statisticians to do very intricate and complicated analyses without knowing the blood and guts of computing systems.". Compared with other popular statistical software, "R has really become the second language for people coming out of grad school now, and there's an amazing amount of code being written for it," said Max Kuhn, associate director of nonclinical statistics at Pfizer. "You can look on the SAS message boards and see there is a proportional downturn in traffic."

#### *Who Should Attend?*

This seminar is intended for financial professionals, actuaries or individuals interested in learning more about the R language.

Knowledge of any programming language is strongly preferable (Matlab, SAS, Visual Basic). Furthermore, knowledge of some quantitative tools such as linear regression, logistic models and Poisson regression is preferable. Nevertheless, a short overview of these concepts will be presented.

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<sup>1</sup> <http://www.nytimes.com/2009/01/07/technology/business-computing/07program.html>

## **Registration Procedure**

**Location** Desautels Faculty of Management McGill University,  
1001 Sherbrooke St. West, Room 625

**Schedule** February 15, 2013 from 09:00 to 17:00

### **Procedure to register**

Interested participants should contact Denise Morin at [ifm2@uqam.ca](mailto:ifm2@uqam.ca) - (514) 987-0409.  
\$395.00 + taxes will be charged to each participant which cover meals, tuition and extensive workshop materials. Admission is on a first-come first-served basis with a maximum of **20 participants**.

### *Key Benefits and Takeaways*

1. Overview of R
2. Applications to standard financial and actuarial procedures
3. Emphasis on empirical results regarding numerical implementation.

### *Program Content*

Morning: 09:30 – 12:30

- Presentation of the R language (R community and packages)
- Standard objects in R (vectors, matrices, time series, data frame, lists)
- Graphics with R
- Importing databases, an introduction to regression models
- More advanced R: R and C++, R and MS Excel

Afternoon: 14:00 – 17:00

- Principal components analysis and application to yield curves
- Regression tree, logistic regression and application to credit scoring
- Poisson regression and applications to claims reserving (IBNR) and projected mortality tables (LifeMetrics)

Course notes and R codes will be made available to participants.

*Seminar leader*

Arthur Charpentier

**Short Biographical Note:**

Professor of actuarial science, in the Mathematics Department at UQAM. PhD in applied Mathematics for the University of Leuven, previously professor at the National School of Statistics and Economics (ENSAE-Paristech), the Université de Rennes 1, and Ecole Polytechnique in France. Arthur Charpentier has been the animator of several seminar on R for French Insurers.

Publications in several peer reviewed journals (Computational Statistics, Journal of Multivariate Analysis, Journal of Applied Probability), of textbooks in actuarial science (*Mathématiques de l'assurance non-vie*, in two volumes, with Michel Denuit), and Editor of *Computation Actuarial Science with R*, forthcoming in 2013.