



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.