

GARPFRM Package

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Overview

The GARPFRM package provides a framework to implement the topics and ideas presented in ‘Financial Risk Manager (FRM) Part 1: Quantitative Analysis’ (2012) and ‘Financial Risk Manager (FRM) Part 1: Foundations of Risk Management’ (2012).

Purpose

The purpose of the package is to implement the concepts and methods presented in the Global Association of Risk Professionals (GARP) Financial Risk Manager (FRM) Part I series of books. Developing the GARPFRM package is a collaborative project between the University of Washington Computational Finance & Risk Management Program and the Global Association of Risk Professionals to develop R packages that facilitate the learning of risk management concepts. The GARPFRM package provides a framework to implement the topics presented in the Financial Risk Manager (FRM) Part 1 books. The user should be able to follow along in the books and using the GARPFRM package and supporting packages.

Why an R Package for GARP FRM?

- An outgrowth of running the UW AMATH MS-Degree Program in Computational Finance and Risk Management
 - Successful extensive use of open source R for teaching and research
- GARP FRM program involves no computation component
 - Learning is more effective if done in conjunction with computing
 - Will be useful FRM Certificate follow-on risk management software
 - Allows one to apply what they learned

<– this is the key idea here and we should go into greater detail –>

- R is open source and widely used by practitioners in finance

Growth of R in Finance

- The Tiobe Index ranked R as the 18th most popular programming language in January 2015, up from 44 in January 2014.
- <http://www.tiobe.com/index.php/content/paperinfo/tpci/index.html>
- The CRAN package repository has 6258 packages as of 2015-02-01
- <http://cran.r-project.org/web/packages/>
- CRAN Task views in finance and econometrics
- <http://cran.r-project.org/web/views/Finance.html>

- <http://cran.r-project.org/web/views/Econometrics.html>
- Rapidly increasing use of open source R in finance industry
- For example DV Trading where Ross works
- Evident with R in Finance Conference

Basic Introduction to R

- What is R?
- Installing R
- <http://www.r-project.org>
- Task views
- Development environments
- RStudio, Eclipse, emacs, command line, etc.

RStudio IDE

GARPFRM Package Overview

- Authors and contributors
- Installing the package
- `install.packages("GARPFRM", repos="http://R-Forge.R-project.org")`
- Documentation of functions
- Vignettes

GARPFRM Package Topics

- Capital Asset Pricing Model
- Delineating Efficient Portfolios
- Performance Measures
- Estimating Volatilities and Correlations
- EWMA Model
- GARCH Model
- VaR Models
- Risk Measures (i.e. VaR, ES, etc.)
- Option Pricing
- Fixed Income Analysis

Delineating Efficient Portfolios

EWMA Model

GARCH Model

Risk Measures

VaR Models

Conclusion

- Thanks and acknowledgements
- Plans for continued development