**Financial Econometrics**

**Practical 1**

* How R thinks
  + Concatenating various variable columns into a single data.frame (NB)
* Basics
  + Arrays
  + Matrices
  + Lists
  + Apply
  + And/or
  + Loops
* Getting Data into R
  + Working with/removing NAs
* Dealing with Dates
  + Wrangling with dates
  + Lubridate
* Saving your Data when finished

**Practical 2**

* Introduction
  + Rmsfuns package
    - Dateconverter (converting dates or selecting specific days, e.g. weekday end of week/month/year)
* Setting up your practical folder
  + Project
    - Loading and saving practical’s data
* Dplyr package
  + Filter()
  + Arrange()
  + Mutate()
  + Summarise()
  + Gather()
  + Spread()
  + Piping operator %>%
* Returns series
  + Mathematical equations for all returns
  + Log and simple returns
* Xts package
  + Use to create various different return series
* Performance analytics package
  + Plotting functionalities
    - Histogram
    - VaR
    - Boxplot
    - QQ-Plot
    - Drawdowns
    - Scatter plot
    - Annualised risk and return
    - Rolling 120 day standard deviation
  + Financial ratios

**Practical 3**

* Introduction
  + Install ggplot2
    - Possibly useful as dataset with similar appearance to ours is used in this practical
    - Shows how to rename tickers, sectors, universes, etc.
  + Plotting Tidy data
    - Boxplots, line plots, scatterplots, etc.
    - Uses BRICS returns data (TRI)

**Practical 4**

* Principal Component Analysis
  + Probably not relevant for our paper unless Nico specifies otherwise

**Practical 4 Application**

* Fit the PCA
  + CONTAINS CODE ON HOW TO RUN MULTIPLE REGRESSIONS IN LITTLE CODE!

**Practical 5**

* Introduction
  + Data and return calculations
    - Removing NAs
    - Calculating daily continuous log returns

**Practical 6**

* Univariate GARCH modelling
* Introduction
  + Packages to load
* Data Import
* Fitting GARCH using rugarch
* Univariate GARCH Plots
* Other univariate GARCH forms

**Practical 7 (NB!)**

* Introduction
  + DCC-GARCH model
  + ADCC-GARCH model
  + GO-GARCH model
* Import data
  + Packages to use
  + Calculating returns and cleaning data
* MV Conditional Heteroskedasticity tests
  + MV modelling: conceptually
* EWMA Models
* BEKK Models
* DCC Models
  + DCC: flexible univariate specs
  + Fitting the Go-GARCH
* Go-GARCH: Orthogonalizing sources of volatility
  + Intuitively…
  + Why should Go-GARCH be used?
  + Fitting the Go-GARCH
  + Time-varying third and fourth moments