10.1-Stock-Index-Futures-Test.R

frmhelp

2021-03-24

# 10.1 Stock Index Futures Test.R  
# read.xlsx, plot, lines, legend  
# Working with futures prices  
# rmarkdown::render("10.1 Stock Index Futures Test.R", "word\_document")  
rm(list = ls()) # Take out the Environment "trash"  
cat("\014") # Clear Console, making error checking easier.

while (!is.null(dev.list())) dev.off() # Clear old plots  
#  
# Times New Roman is not available in PostScript  
#  
#par(family = 'Times New Roman') # Globally set fonts for graphs  
# Technical plot manipulations require resetting back to default  
defaultpar <- par() # plot global parameters  
# Libraries  
# openxlsx: MS Excel file management  
# zoo: time-series management  
# date: calendar time  
# moments: Skewness and kurtosis  
# stats: Statistical functions  
# PerformanceAnalytics: Higher moments  
# RColorBrewer:   
# SDMTools:   
# weights:  
# xts: Extended time series  
# rootSolve:   
# Weighted.Desc.Stat:   
Packages <- c("openxlsx", "zoo", "date", "moments", "stats",  
 "PerformanceAnalytics", "RColorBrewer", "SDMTools", "weights",  
 "xts", "rootSolve", "Weighted.Desc.Stat") # Libraries  
if(length(setdiff(Packages, rownames(installed.packages()))) > 0) {  
 install.packages(setdiff(Packages, rownames(installed.packages())))  
} # Make sure libraries are installed on this computer  
lapply(Packages, library, character.only=TRUE) # Load and attach libraries

##   
## Attaching package: 'zoo'

## The following objects are masked from 'package:base':  
##   
## as.Date, as.Date.numeric

## Loading required package: xts

##   
## Package PerformanceAnalytics (1.5.2) loaded.  
## Copyright (c) 2004-2018 Peter Carl and Brian G. Peterson, GPL-2 | GPL-3  
## https://github.com/braverock/PerformanceAnalytics

##   
## Attaching package: 'PerformanceAnalytics'

## The following objects are masked from 'package:moments':  
##   
## kurtosis, skewness

## The following object is masked from 'package:graphics':  
##   
## legend

##   
## Attaching package: 'SDMTools'

## The following object is masked from 'package:PerformanceAnalytics':  
##   
## Kappa

## Loading required package: Hmisc

## Loading required package: lattice

## Loading required package: survival

## Loading required package: Formula

## Loading required package: ggplot2

##   
## Attaching package: 'Hmisc'

## The following objects are masked from 'package:base':  
##   
## format.pval, units

## Loading required package: gdata

## gdata: read.xls support for 'XLS' (Excel 97-2004)  
## gdata: files ENABLED.

##

## gdata: read.xls support for 'XLSX' (Excel 2007+)  
## gdata: files ENABLED.

##   
## Attaching package: 'gdata'

## The following objects are masked from 'package:xts':  
##   
## first, last

## The following object is masked from 'package:stats':  
##   
## nobs

## The following object is masked from 'package:utils':  
##   
## object.size

## The following object is masked from 'package:base':  
##   
## startsWith

## Loading required package: mice

## [[1]]  
## [1] "openxlsx" "stats" "graphics" "grDevices"  
## [5] "utils" "datasets" "methods" "base"   
##   
## [[2]]  
## [1] "zoo" "openxlsx" "stats" "graphics"   
## [5] "grDevices" "utils" "datasets" "methods"   
## [9] "base"   
##   
## [[3]]  
## [1] "date" "zoo" "openxlsx" "stats"   
## [5] "graphics" "grDevices" "utils" "datasets"   
## [9] "methods" "base"   
##   
## [[4]]  
## [1] "moments" "date" "zoo" "openxlsx"   
## [5] "stats" "graphics" "grDevices" "utils"   
## [9] "datasets" "methods" "base"   
##   
## [[5]]  
## [1] "moments" "date" "zoo" "openxlsx"   
## [5] "stats" "graphics" "grDevices" "utils"   
## [9] "datasets" "methods" "base"   
##   
## [[6]]  
## [1] "PerformanceAnalytics" "xts"   
## [3] "moments" "date"   
## [5] "zoo" "openxlsx"   
## [7] "stats" "graphics"   
## [9] "grDevices" "utils"   
## [11] "datasets" "methods"   
## [13] "base"   
##   
## [[7]]  
## [1] "RColorBrewer" "PerformanceAnalytics"  
## [3] "xts" "moments"   
## [5] "date" "zoo"   
## [7] "openxlsx" "stats"   
## [9] "graphics" "grDevices"   
## [11] "utils" "datasets"   
## [13] "methods" "base"   
##   
## [[8]]  
## [1] "SDMTools" "RColorBrewer"   
## [3] "PerformanceAnalytics" "xts"   
## [5] "moments" "date"   
## [7] "zoo" "openxlsx"   
## [9] "stats" "graphics"   
## [11] "grDevices" "utils"   
## [13] "datasets" "methods"   
## [15] "base"   
##   
## [[9]]  
## [1] "weights" "mice"   
## [3] "gdata" "Hmisc"   
## [5] "ggplot2" "Formula"   
## [7] "survival" "lattice"   
## [9] "SDMTools" "RColorBrewer"   
## [11] "PerformanceAnalytics" "xts"   
## [13] "moments" "date"   
## [15] "zoo" "openxlsx"   
## [17] "stats" "graphics"   
## [19] "grDevices" "utils"   
## [21] "datasets" "methods"   
## [23] "base"   
##   
## [[10]]  
## [1] "weights" "mice"   
## [3] "gdata" "Hmisc"   
## [5] "ggplot2" "Formula"   
## [7] "survival" "lattice"   
## [9] "SDMTools" "RColorBrewer"   
## [11] "PerformanceAnalytics" "xts"   
## [13] "moments" "date"   
## [15] "zoo" "openxlsx"   
## [17] "stats" "graphics"   
## [19] "grDevices" "utils"   
## [21] "datasets" "methods"   
## [23] "base"   
##   
## [[11]]  
## [1] "rootSolve" "weights"   
## [3] "mice" "gdata"   
## [5] "Hmisc" "ggplot2"   
## [7] "Formula" "survival"   
## [9] "lattice" "SDMTools"   
## [11] "RColorBrewer" "PerformanceAnalytics"  
## [13] "xts" "moments"   
## [15] "date" "zoo"   
## [17] "openxlsx" "stats"   
## [19] "graphics" "grDevices"   
## [21] "utils" "datasets"   
## [23] "methods" "base"   
##   
## [[12]]  
## [1] "Weighted.Desc.Stat" "rootSolve"   
## [3] "weights" "mice"   
## [5] "gdata" "Hmisc"   
## [7] "ggplot2" "Formula"   
## [9] "survival" "lattice"   
## [11] "SDMTools" "RColorBrewer"   
## [13] "PerformanceAnalytics" "xts"   
## [15] "moments" "date"   
## [17] "zoo" "openxlsx"   
## [19] "stats" "graphics"   
## [21] "grDevices" "utils"   
## [23] "datasets" "methods"   
## [25] "base"

rm(Packages)  
#  
# Common information for all functions  
#  
File = 'SPX LSC.xlsx'  
mTitle1 <- 'US S&P 500'  
#  
# Plots (Pseudo possible, fix limits--better for analysis)  
# Produces one plot for every day  
# Open all \*.jpg files and print to PDF  
# Open PDF and scroll through in full screen mode  
#   
PlotPseudoPrices <- TRUE # TRUE: Plot both prices and pseudo prices  
FixedLimits <- TRUE # Used for daily plots  
# source('Period Plots.R', print.eval = TRUE)  
#  
# unlink('\*.jpg') # Rather dangerous, deletes all files with extension jpg  
#  
# Selected Term Premium Analysis  
#  
NumberOfNearbys = 3  
Title1 = as.character('S&P 500')  
FPFixedBounds = TRUE # Fix y-axis for Marginal Term Premiums  
FPUpperBound = 2100  
FPLowerBound = 600  
TPFixedBounds = TRUE # Fix y-axis for Marginal Term Premiums  
TPUpperBound = 1.5  
TPLowerBound = -1.5  
# FP v Date, TP1, TP3 and Rates v Date  
StartDate = 20041231  
EndDate = 20091231  
sTitle = expression(paste("12/31/2004 through 12/31/2009"))  
source('Futures Term Premiums.R')

## Warning in par(defaultpar): graphical parameter "cin"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "cra"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "csi"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "cxy"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "din"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "page"  
## cannot be set

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## cannot be set

## Warning in par(defaultpar): graphical parameter "cra"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "csi"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "cxy"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "din"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "page"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "cin"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "cra"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "csi"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "cxy"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "din"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "page"  
## cannot be set

StartDate = 20091231  
EndDate = 20141231  
sTitle = expression(paste("12/31/2009 through 12/31/2014"))  
source('Futures Term Premiums.R')

## Warning in par(defaultpar): graphical parameter "cin"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "cra"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "csi"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "cxy"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "din"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "page"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "cin"  
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## Warning in par(defaultpar): graphical parameter "csi"  
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## Warning in par(defaultpar): graphical parameter "cxy"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "din"  
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## Warning in par(defaultpar): graphical parameter "cxy"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "din"  
## cannot be set

## Warning in par(defaultpar): graphical parameter "page"  
## cannot be set

# MTP, Rates v Date (pick nearbys to plot)  
Plots <- c(3) # Identifies which maturity plots to generate (1-12, up to 12)  
IncludeRates <- TRUE # Include period rates in term premium graphs  
StartDate = 20041231  
EndDate = 20091231  
sTitle = expression(paste("12/31/2004 through 12/31/2009"))  
source('Term Premium Plots.R', print.eval = TRUE)  
StartDate = 20091231  
EndDate = 20141231  
sTitle = expression(paste("12/31/2009 through 12/31/2014"))  
source('Term Premium Plots.R', print.eval = TRUE)  
#  
# Percentage Change in Futures  
#  
PCFFixedBounds = TRUE # Fix y-axis for Percentage Change in Futures  
PCFUpperBound = 2.5  
PCFLowerBound = -2.5  
StartDate = 20041231  
EndDate = 20091231  
sTitle = expression(paste("12/31/2004 through 12/31/2009"))  
source('Percentage Change in Futures Plots.R', print.eval = TRUE)  
StartDate = 20091231  
EndDate = 20141231  
sTitle = expression(paste("12/31/2009 through 12/31/2014"))  
source('Percentage Change in Futures Plots.R', print.eval = TRUE)  
#  
# Marginal Contribution Analysis  
#  
MCFixedBounds <- TRUE  
MCUpperBound <- TPUpperBound  
MCLowerBound <- TPLowerBound  
StartDate = 20041231  
EndDate = 20091231  
sTitle = expression(paste("12/31/2004 through 12/31/2009"))  
source('Marginal Contribution Plots.R')  
StartDate = 20091231  
EndDate = 20141231  
sTitle = expression(paste("12/31/2009 through 12/31/2014"))  
source('Marginal Contribution Plots.R')  
# #  
# # Selected Measures Evidencing Carry Arbitrage  
# #  
RollingWindow <- 26 # For exponentially weighted moving average  
Lambda = 0.94 # Base case: 0.94 (0.9999 is equally weighted)  
# LengthArb <- 100 # Maximum number of contracts to store arb data  
ArbMaturity = 6 # Coded for 6 months or 12 months  
CAAFixedBounds = FALSE # Fix y-axis for Marginal Contributions  
CAAUpperBound = 1.0  
CAALowerBound = -1.0  
StartDate = 20041231  
EndDate = 20091231  
sTitle = expression(paste("12/31/2004 through 12/31/2009"))  
source('CAA Process Generic Data.R')  
StartDate = 20091231  
EndDate = 20141231  
sTitle = expression(paste("12/31/2009 through 12/31/2014"))  
source('CAA Process Generic Data.R')