**R-script and Stata commands**

R-script

setwd("/Users/Erling/Desktop/SKole/Master/R")

attach(RegData3)

# Install packages

library(car)

library(lmtest)

library(lme4)

library(urca)

library(orcutt)

library(pastecs)

library(tseries)

library(quantreg)

# Descriptive statistics

summary(RegData3)

datatable=data.frame(ERP,ERM,GOLD,FXR,I,WTI,SMB,HML)

cor(datatable)

pairs(datatable, col="blue", main="Scatterplots")

#Assumptions OLS

"Normaly distributed"

jarque.bera.test(RegData3$ERP)

jarque.bera.test(RegData3$ERM)

jarque.bera.test(RegData3$GOLD)

jarque.bera.test(RegData3$FXR)

jarque.bera.test(RegData3$I)

jarque.bera.test(RegData3$WTI)

jarque.bera.test(RegData3$SMB)

jarque.bera.test(RegData3$HML)

"Stationarity"

adf.test(RegData3$ERP)

adf.test(RegData3$ERM)

adf.test(RegData3$GOLD)

adf.test(RegData3$FXR)

adf.test(RegData3$I)

adf.test(RegData3$WTI)

adf.test(RegData3$SMB)

adf.test(RegData3$HML)

"Heteroskedasticity"

bptest(RegData3)

"Autocolleraltion"

bgtest(RegData3, order=50)

# Defining variables

Y=cbind(ERP)

X=cbind(ERM, GOLD, FXR, I, WTI, SMB, HML)

#OLSreg

hist(Y, prob=TRUE, col = "blue", border = "black")

lines(density(Y))

OLSreg=lm(Y~X)

summary(OLSreg)

summary.lm(reg1 <- lm(ERP~ERM+FXR+I+WTI+GOLD+SMB+HML, data = RegData3 ))

#Qreg

QR=rq(Y~X, tau=seq(0.05, 0.95, by=0.05), alpha=.5)

sumQR=summary(QR)

plot(sumQR, xlab="Quantile", ylab="Beta")

summary(QR)

summary(QR,se = "nid")

QR

#Goodness of fit Qreg

data(engel)

fit0 <- rq(Y~1,tau=0.05,data=engel)

fit1 <- rq(Y~X,tau=0.05,data=engel)

rho <- function(u,tau=.5)u\*(tau - (u < 0))

R1 <- 1 - fit1$rho/fit0$rho

R1

fit0 <- rq(Y~1,tau=0.1,data=engel)

fit1 <- rq(Y~X,tau=0.1,data=engel)

rho <- function(u,tau=.5)u\*(tau - (u < 0))

R1 <- 1 - fit1$rho/fit0$rho

R1

fit0 <- rq(Y~1,tau=0.25,data=engel)

fit1 <- rq(Y~X,tau=0.25,data=engel)

rho <- function(u,tau=.5)u\*(tau - (u < 0))

R1 <- 1 - fit1$rho/fit0$rho

R1

fit0 <- rq(Y~1,tau=0.5,data=engel)

fit1 <- rq(Y~X,tau=0.5,data=engel)

rho <- function(u,tau=.5)u\*(tau - (u < 0))

R1 <- 1 - fit1$rho/fit0$rho

R1

fit0 <- rq(Y~1,tau=0.75,data=engel)

fit1 <- rq(Y~X,tau=0.75,data=engel)

rho <- function(u,tau=.5)u\*(tau - (u < 0))

R1 <- 1 - fit1$rho/fit0$rho

R1

fit0 <- rq(Y~1,tau=0.9,data=engel)

fit1 <- rq(Y~X,tau=0.9,data=engel)

rho <- function(u,tau=.5)u\*(tau - (u < 0))

R1 <- 1 - fit1$rho/fit0$rho

R1

fit0 <- rq(Y~1,tau=0.95,data=engel)

fit1 <- rq(Y~X,tau=0.95,data=engel)

rho <- function(u,tau=.5)u\*(tau - (u < 0))

R1 <- 1 - fit1$rho/fit0$rho

R1

Stata

We used Stata to run the Fama-MacBeth regression and bootstrapping quantile regressions.

#Fama-MacBeth

import excel “M:/STATA/Paneldata”

do “M:/fm.ado”

tsset firmid time

fm ERF Gold ERM Size BM

#Bootstrapping quantile regression

Statistics 🡪 Nonparametric models 🡪 Bootstrapping quantile regression 🡪 Dependent variable: ERP 🡪 Independent variables: ERM, Gold, FXR, I, WTI, SMB, HML

Max iterations set to 1000.