Financial Econometrics

R Commands Used in Lecture 8

Prof. Hamed Ghoddusi
2019

Command: RiskMetrics

> da=read.table("d-ibm-0110.txt",header=T) **### Loading the data**

> head(da)

> ibm=log(da$return+1)

> nibm=-ibm

RiskMetrics

> source("RMfit.R")

> RMfit(nibm)

One can use default parameter beta = 0.96 without estimation with the following command

> RMfit(nibm,estim=F)

Command: Econometric Modeling

```
> require(fGarch)
> m1=garchFit(~garch(1,1),data=nibm,trace=F)
> summary(m1)
> pm1=predict(m1,10)
> pm1
> source("RMeasure.R")
> RMeasure(-.0006,.00782)
> names(pm1)
```

Command: 10-day VaR

> v1=sqrt(sum(pm1$standardDeviation^2))

> RMeasure(-0.006,v1)

> m2=garchFit(~garch(1,1),data=nibm,trace=F,cond.dist="std")

> summary(m2)

> pm2=predict(m2,1)

> pm2

> RMeasure(-.000411,.0081,cond.dist="std",df=5.751)

Command: Empirical Quantile and Quantile Regression

```
> quantile(nibm,c(0.95,0.99,0.999))
> da1=read.table("d-ibm-rq.txt",header=T)
> fix(da1)
> require(quantreg)
> m3=rq(nibm~vol+vix,data=da1,tau=0.95)
> summary(m3)
> ts.plot(nibm)
> lines(m3$fitted.values,col="red")
```

Command: Extreme Value Theory

```
> require(evir)
> m4=gev(nibn,block=21)
> m4
> source("evtVaR.R")
> evtVaR(0.2517,0.0103,0.0297)
```

Command: Peaks over Threshold

> m4a=pot(nibm,thres=0.01)

> plot(m4a)

> riskmeasures(m4a,c(0.95,0.99,0.999))

Command: Generalized Pareto Distribution

> m5=gpd(nibm,0.01)

> m5

> plot(m5)

> riskmeasures(m5,c(0.95,0.99,0.999))

Command: Simulation to Check on Limiting Distribution of Maximum

> source("EVTsim.R") **## The file has two functions: EVTsim and qgumble**

> m1 <- EVTsim(n=500,iter=5000)

> quantile(m1$stmax,prob=c(0.95,0.975,0.99))

> qgumble(prob=c(0.95,0.975,0.99)) **## Compute quantile of the standard Gumble distribution**