Risk modeling

Kaharou Bawa Bouakri

9/12/2021

This study is about assessing the risk involved on investing in some virtual currencies suck as: bitcoin, etherium and dogecoin

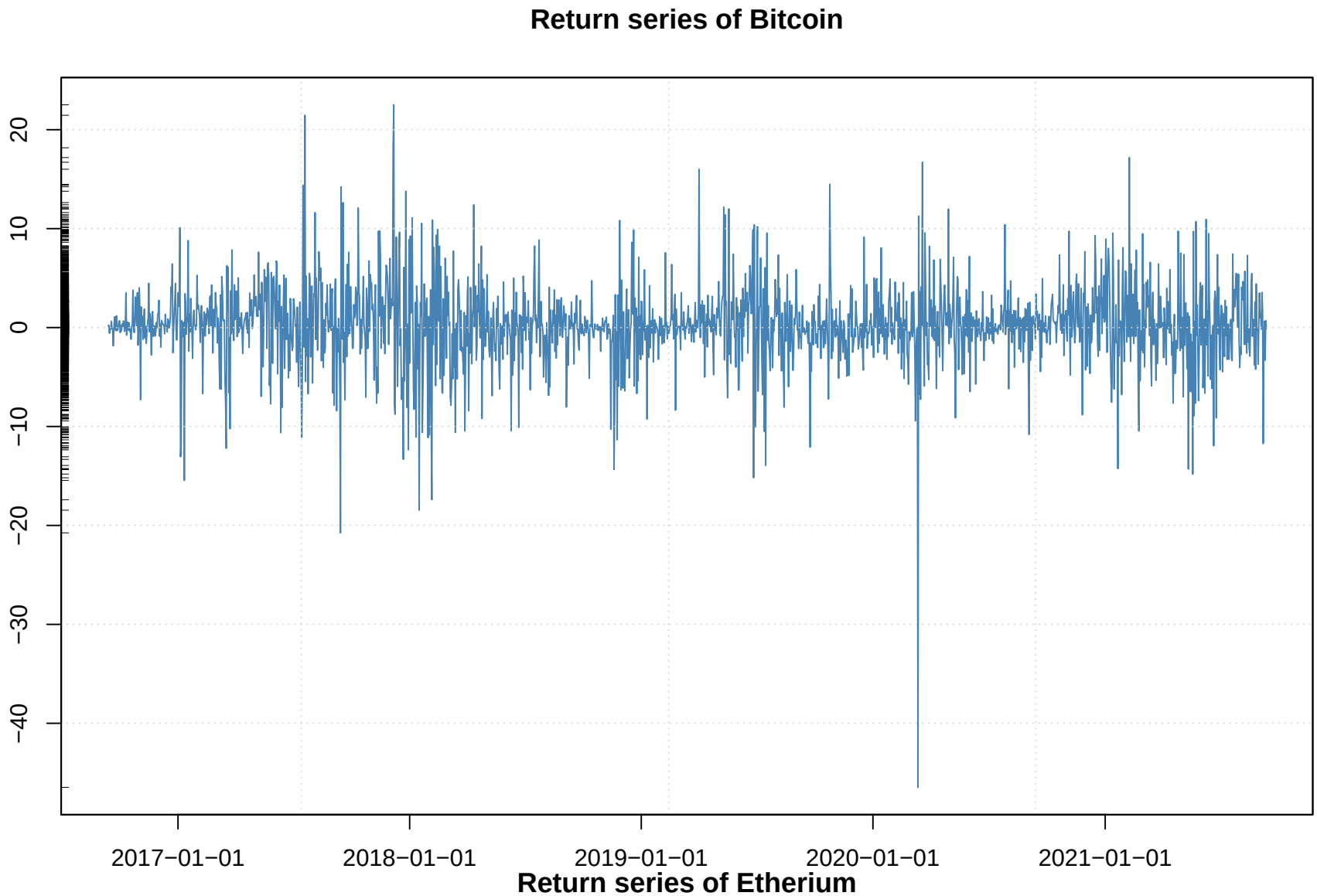
Loading data into R

EDA

```
## Loading required package: cccp

## Loading required package: Rglpk

## Loading required package: slam

## Using the GLPK callable library version 4.65

## Loading required package: timeSeries

## Loading required package: timeDate

## Financial Risk Modelling and Portfolio Optimisation with

## spec_tbl_df [1,827 x 7] (S3: spec_tbl_df/tbl_df/tbl/data
##  $ Date     : Date[1:1827], format: "2016-09-12" "2016-0
```

Return series

```
##  num [1:1823] 608 609 611 607 607 ...
##  - attr(*, "time")= Date[1:1823], format: "2016-09-12" "
```



Average rate of return of all three coins

```
## [1] 0.2364199 0.3826031 0.3094141
```

Dogecoin has a higher return over bitcoin and etherium.

Risk of each Coin Measured as Standard Deviation & return per risk

```
## [1] 4.165947 8.104087 5.622477
```

```
## [1] 0.05675058 0.04721114 0.05503164
```

It's more risky to invest on dodgecoin than etherium and bitcoin.

So bitcoin is better assets to invest on based on return over risk.

Risk of a portfolio of 3 assets made up of Bitcoin, Etherium, Dogecoin.

Proportion (%) to invest on each asset for a Global Minimum Variance Portfolio (PGMV)

```
##     BTCRet     ETHRet     DOGRet
## 89.382127  8.069529  2.548345
```

```
## [1] 0.2500763 4.1666150 6.8540816
```

For a portfolio of the 3 currencies with global minimum variance, the Expected return would be (ERp=0.25) and the Risk would be (Risk=4.167) and a value at risk of (VaR=6.85)

Proportion (%) to invest on each asset for an equal risk contributed portfolio (PERC)

```
## Iteration: 0
## pobj: 0
## dobj: 24.2054
## pinf: 1
## dinf: 1
## dgap: 4
##
## Iteration: 1
## pobj: -18.2382
## dobj: 3.51905
## pinf: 0.803575
## dinf: 0.164305
## dgap: 0.268368
##
## Iteration: 2
## pobj: 2.35171
## dobj: 3.46613
```