Fama & French 3 et 5 Factors

Import de la table à 3 facteurs

Cette table est issue du https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html (https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html) . Celui-ci recense les diiférents facteurs tant pour le modèle à 3 qu'à 5 facteurs du continent Américain à l'Europe.

Formatage de la table

```
FFF$'...1'=NULL
FFF$`Mkt-RF`=gsub(",", '.', FFF$`Mkt-RF`, fixed = T)
FFF$`SMB`=gsub(",", '.', FFF$`SMB`, fixed = T)
FFF$`HML`=gsub(",", '.', FFF$`HML`, fixed = T)
FFF$`RF`=gsub(",", '.', FFF$`RF`, fixed = T)
FFF$SMB= as.numeric(FFF$SMB)
FFF$HML= as.numeric(FFF$HML)
FFF$RF= as.numeric(FFF$RF)
FFF$`Mkt-RF`= as.numeric(FFF$`Mkt-RF`)
FFF$date=parse_date_time(FFF$date, "%Y%m")
FFF$date = lubridate::rollback(FFF$date)

FFF$`Mkt-RF`= FFF$`Mkt-RF`/100
FFF$SMB= FFF$SMB/100
FFF$HML= FFF$HML/100
FFF$RF= FFF$RF/100
```

Calcul des rendements

Modélisation

```
reg=lm(R_excess ~ `Mkt-RF` + SMB + HML,
   data = FFF)
summary(reg)
```

```
##
## Call:
## lm(formula = R_excess ~ `Mkt-RF` + SMB + HML, data = FFF)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -0.088390 -0.017723 -0.000132  0.016295  0.073082
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  7.259e-05  1.847e-03   0.039    0.969
## `Mkt-RF`     6.807e-01  3.627e-02  18.768   <2e-16 ***
## SMB         -2.529e-02  9.559e-02  -0.265    0.792
## HML         -1.113e-01  8.225e-02  -1.353    0.177
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02733 on 221 degrees of freedom
##   (1 observation deleted due to missingness)
## Multiple R-squared:  0.6276, Adjusted R-squared:  0.6226
## F-statistic: 124.2 on 3 and 221 DF,  p-value: < 2.2e-16
```

```
AIC(reg)
```

```
## [1] -975.4382
```

```
BIC(reg)
```

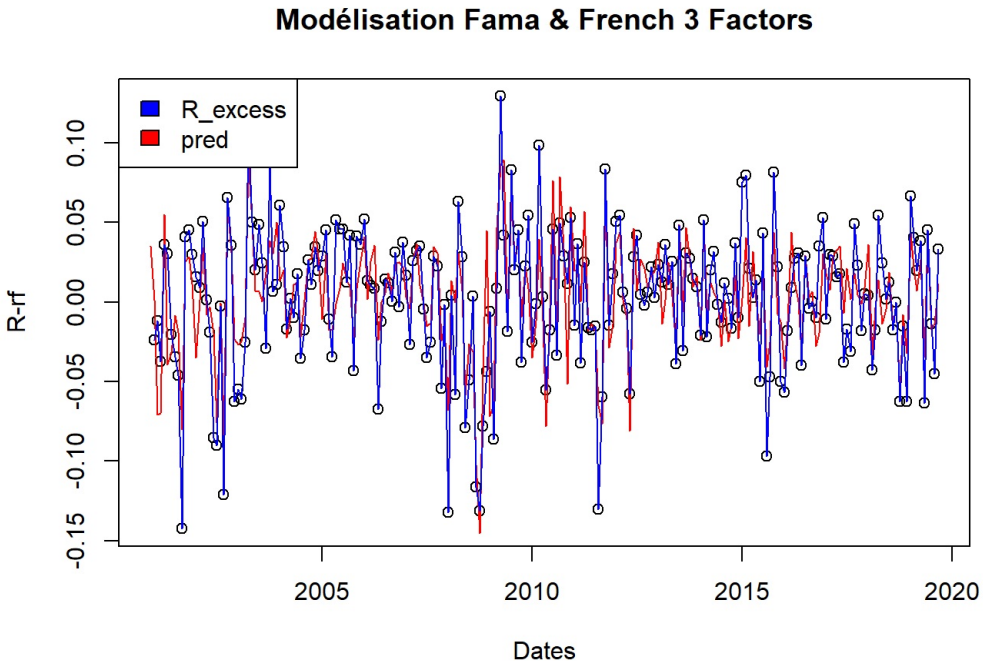
```
## [1] -958.3577
```

Estimation des rendements

```
FFF$pred=7.259e-05 + 6.807e-01* FFF$`Mkt-RF` + -2.529e-02 * FFF$SMB + -1.113e-01*FFF$HML
```

Representation graphique

```
plot(FFF$date, FFF$R_excess,main="Modélisation Fama & French 3 Factors", ylab = "R-rf", xlab = "Dates")
lines(FFF$date , FFF$pred, col = "red")
lines(FFF$date , FFF$R_excess, col = "blue")
legend("topleft",
       c("R_excess","pred"),
       fill=c("blue","red"))
```



Import Fama French 5 factors

```
FFF <- read_excel("D:/Documents/Cours M2 MoSEF/Projets M2 MoSEF/Finance Base/Europe_5_Factors.xlsx")
```

```
## New names:
## * `` -> ...1
```

```
FFF$'...1'=NULL
FFF$`Mkt-RF`=gsub(",", '.', FFF$`Mkt-RF`, fixed = T)
FFF$`SMB`=gsub(",", '.', FFF$`SMB`, fixed = T)
FFF$`HML`=gsub(",", '.', FFF$`HML`, fixed = T)
FFF$`RF`=gsub(",", '.', FFF$`RF`, fixed = T)
FFF$SMB= as.numeric(FFF$SMB)
FFF$HML= as.numeric(FFF$HML)
FFF$RF= as.numeric(FFF$RF)
FFF$RMW= as.numeric(FFF$RMW)
FFF$CMA= as.numeric(FFF$CMA)
FFF$`Mkt-RF`= as.numeric(FFF$`Mkt-RF`)
FFF$date=parse_date_time(FFF$date, "%Y%m")
FFF$date = lubridate::rollback(FFF$date)
FFF$`Mkt-RF`= FFF$`Mkt-RF`/100
FFF$SMB= FFF$SMB/100
FFF$HML= FFF$HML/100
FFF$RF= FFF$RF/100
FFF$RMW= FFF$RMW/100
FFF$CMA= FFF$CMA/100
```

```
FFF$Shift <- lag(FFF$Prix ,1,na.pad = TRUE)
FFF$Rendements = (FFF$Prix - FFF$Shift) /FFF$Shift
FFF$R_excess = round(FFF$Rendements - FFF$RF, 4)
```

Modélisation Farma&French 5 facteurs

```
reg=lm(R_excess ~ `Mkt-RF` + SMB + HML + RMW + CMA,
       data = FFF)
summary(reg)
```

```
##
## Call:
## lm(formula = R_excess ~ `Mkt-RF` + SMB + HML + RMW + CMA, data = FFF)
##
## Residuals:
##       Min        1Q    Median        3Q       Max
## -0.080196 -0.018213 -0.000801  0.016318  0.073161
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.0007383  0.0019887   0.371    0.711
## `Mkt-RF`     0.6439174  0.0438266  14.692   <2e-16 ***
## SMB         -0.0624098  0.0981636  -0.636    0.526
## HML         -0.0099926  0.1226407  -0.081    0.935
## RMW         -0.0225132  0.1451158  -0.155    0.877
## CMA         -0.2334534  0.1518956  -1.537    0.126
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.0273 on 219 degrees of freedom
##   (1 observation deleted due to missingness)
## Multiple R-squared:  0.6319, Adjusted R-squared:  0.6235
## F-statistic: 75.18 on 5 and 219 DF,  p-value: < 2.2e-16
```

```
AIC(reg)
```

```
## [1] -974.0206
```

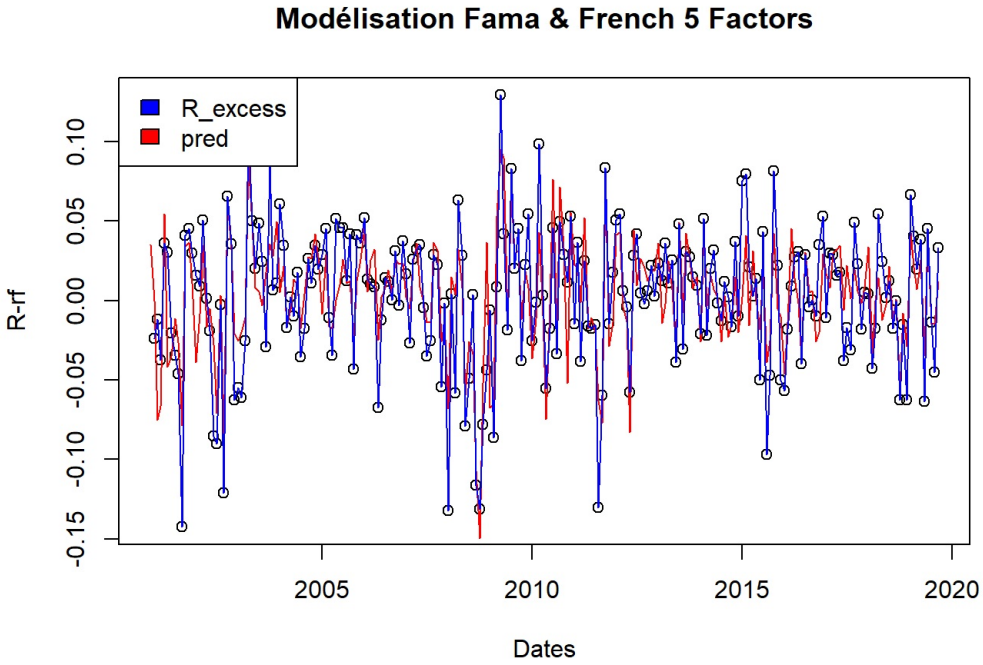
```
BIC(reg)
```

```
## [1] -950.1079
```

```
FFF$pred=0.0007383 + 0.6439174* FFF$`Mkt-RF` + -0.0624098 * FFF$SMB + -0.0099926 * FFF$HML + -0.0225132 *FFF$RMW +
-0.2334534 * FFF$CMA
```

Représentatioon graphique

```
plot(FFF$date, FFF$R_excess,main="Modélisation Fama & French 5 Factors", ylab = "R-rf", xlab = "Dates")
lines(FFF$date , FFF$pred, col = "red")
lines(FFF$date , FFF$R_excess, col = "blue")
legend("topleft",
       c("R_excess","pred"),
       fill=c("blue","red"))
```


Modélisation Fama & French 5 Factors
R_excess
pred
R-rf
0.10
0.05
0.00
-0.05
-0.10
-0.15
2005
2010
2015
2020
Dates