

FAMA-regression.R

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```
library(readxl)
```

```
## Warning: package 'readxl' was built under R version 4.0.5
```

```
#### FAMA ####
```

```
library(readxl)
```

```
FAMA <- read_excel("~/Documents/Master/4 Semester/Master Thesis/DATA.xlsx",  
                  sheet = "Fama", skip = 3)
```

```
## New names:
```

```
## * Date -> Date...1
```

```
## * 'Mkt-RF' -> 'Mkt-RF...2'
```

```
## * SMB -> SMB...3
```

```
## * HML -> HML...4
```

```
## * RMW -> RMW...5
```

```
## * ...
```

```
FAMA <- subset (FAMA, select = -c(34:36))
```

```
FAMA <- subset (FAMA, select = -c(26:28))
```

```
FAMA <- subset (FAMA, select = -c(1:11))
```

```
colnames(FAMA) <- c("Date", "MRRF", "SMB", "HML", "RMW", "CMA", "MOM", "RF")
```

```
EW <- read_excel("~/Documents/Master/4 Semester/Master Thesis/DATA.xlsx",  
                 sheet = "EW", skip = 1)
```

```
## New names:
```

```
## * Low -> Low...1
```

```
## * High -> High...3
```

```
## * Low -> Low...5
```

```
## * High -> High...6
```

```
colnames(EW) <- c("ML_EW", "MM_EW", "MH_EW", "TR_Fail_EW", "TR_Low_EW", "TR_High_EW", "HTR_LM_EW", "HTR_HM_EW")
```

```
VW <- read_excel("~/Documents/Master/4 Semester/Master Thesis/DATA.xlsx",  
                 sheet = "VW", skip = 1)
```

```

## New names:
## * Low -> Low...1
## * High -> High...3
## * Low -> Low...5
## * High -> High...6
## * ' ' -> ...12
## * ...

colnames(VW) <- c("ML_VW", "MM_VW", "MH_VW", "TR_Fail_VW", "TR_Low_VW", "TR_High_VW", "HTR_LM_VW", "HTR_HM_VW")

#### SASB Portfolios ####

#### EW MAT - Low #####

ML_EW <- as.numeric(EW$ML_EW) - as.numeric(FAMA$RF)

#Regression

ML_EW_ff5reg <- lm(formula="ML_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(ML_EW_ff5reg))

```

```

##
## Call:
## lm(formula = "ML_EW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.049070 -0.012516 -0.003121  0.014582  0.049527
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.0004746  0.0019525  -0.243  0.8084
## MRRF         0.7964493  0.0514416  15.483 <2e-16 ***
## SMB          0.3017812  0.1163887   2.593  0.0108 *
## HML          0.0302742  0.1525279   0.198  0.8430
## RMW          0.4858386  0.1951315   2.490  0.0142 *
## CMA         -0.1440150  0.2104940  -0.684  0.4953
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02008 on 114 degrees of freedom
## Multiple R-squared:  0.7662, Adjusted R-squared:  0.7559
## F-statistic: 74.71 on 5 and 114 DF,  p-value: < 2.2e-16

```

```

ML_EW_ff5_MOM_reg <- lm(formula="ML_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(ML_EW_ff5_MOM_reg))

```

```

##
## Call:
## lm(formula = "ML_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM", data = FAMA)
##
## Residuals:

```

```

##           Min           1Q           Median           3Q           Max
## -0.048460 -0.010946 -0.003742  0.014041  0.049973
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.0001903  0.0020450   0.093  0.92604
## MRRF         0.7860000  0.0522968  15.030 < 2e-16 ***
## SMB          0.3173142  0.1171771   2.708  0.00782 **
## HML          -0.0515288  0.1700486  -0.303  0.76243
## RMW          0.4847344  0.1949833   2.486  0.01438 *
## CMA          -0.0737681  0.2200761  -0.335  0.73810
## MOM          -0.0854868  0.0788133  -1.085  0.28037
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02006 on 113 degrees of freedom
## Multiple R-squared:  0.7686, Adjusted R-squared:  0.7563
## F-statistic: 62.55 on 6 and 113 DF,  p-value: < 2.2e-16

```

```
##### VW MAT - Low #####
```

```
ML_VW <- as.numeric(VW$ML_VW) - as.numeric(FAMA$RF)
```

```
#Regression
```

```
ML_VW_ff5reg <- lm(formula="ML_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(ML_VW_ff5reg))
```

```

##
## Call:
## lm(formula = "ML_VW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##           Min           1Q           Median           3Q           Max
## -0.045532 -0.011962  0.002139  0.010207  0.050255
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.001676  0.001777   0.944  0.3474
## MRRF         0.650253  0.046814  13.890 <2e-16 ***
## SMB          -0.150554  0.105919  -1.421  0.1579
## HML          -0.063659  0.138807  -0.459  0.6474
## RMW          0.391760  0.177578   2.206  0.0294 *
## CMA          -0.093983  0.191559  -0.491  0.6246
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01827 on 114 degrees of freedom
## Multiple R-squared:  0.703, Adjusted R-squared:  0.69
## F-statistic: 53.97 on 5 and 114 DF,  p-value: < 2.2e-16

```

```
ML_VW_ff5_MOM_reg <- lm(formula="ML_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(ML_VW_ff5_MOM_reg))
```

```
##
## Call:
## lm(formula = "ML_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.045130 -0.011855  0.002139  0.010439  0.049848
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.001789   0.001870   0.956  0.3409
## MRRF         0.648488   0.047831  13.558 <2e-16 ***
## SMB        -0.147930   0.107171  -1.380  0.1702
## HML        -0.077475   0.155527  -0.498  0.6194
## RMW         0.391573   0.178333   2.196  0.0302 *
## CMA        -0.082119   0.201283  -0.408  0.6841
## MOM        -0.014438   0.072083  -0.200  0.8416
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01835 on 113 degrees of freedom
## Multiple R-squared:  0.7031, Adjusted R-squared:  0.6873
## F-statistic: 44.6 on 6 and 113 DF, p-value: < 2.2e-16
```

EW MAT - Med

```
MM_EW <- as.numeric(EW$MM_EW) - as.numeric(FAMA$RF)

#Regression
MM_EW_ff5reg <- lm(formula="MM_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(MM_EW_ff5reg))
```

```
##
## Call:
## lm(formula = "MM_EW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.044892 -0.015471 -0.000665  0.017330  0.052081
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.004559   0.002090  -2.181  0.031247 *
## MRRF         0.807446   0.055073  14.661 < 2e-16 ***
## SMB         0.243445   0.124604   1.954  0.053180 .
## HML         0.289966   0.163294   1.776  0.078445 .
## RMW         0.783974   0.208905   3.753  0.000277 ***
## CMA        -0.069716   0.225351  -0.309  0.757609
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02149 on 114 degrees of freedom
## Multiple R-squared:  0.7605, Adjusted R-squared:  0.75
## F-statistic: 72.4 on 5 and 114 DF, p-value: < 2.2e-16
```

```
MM_EW_ff5_MOM_reg <- lm(formula="MM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(MM_EW_ff5_MOM_reg))
```

```
##
## Call:
## lm(formula = "MM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.042568 -0.013413 -0.000809  0.015508  0.053077
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.003074   0.002151  -1.429 0.155708
## MRRF         0.784112   0.055003  14.256 < 2e-16 ***
## SMB         0.278131   0.123240   2.257 0.025942 *
## HML         0.107293   0.178847   0.600 0.549764
## RMW         0.781508   0.205072   3.811 0.000226 ***
## CMA         0.087151   0.231463   0.377 0.707234
## MOM        -0.190899   0.082891  -2.303 0.023108 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.0211 on 113 degrees of freedom
## Multiple R-squared:  0.7712, Adjusted R-squared:  0.7591
## F-statistic: 63.49 on 6 and 113 DF,  p-value: < 2.2e-16
```

VW MAT - Med

```
MM_VW <- as.numeric(VW$MM_VW) - as.numeric(FAMA$RF)

#Regression
MM_VW_ff5reg <- lm(formula="MM_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(MM_VW_ff5reg))
```

```
##
## Call:
## lm(formula = "MM_VW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.04440 -0.01451 -0.00097  0.01514  0.07849
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.001377   0.002110  -0.652 0.515516
## MRRF         0.717135   0.055602  12.898 < 2e-16 ***
## SMB        -0.276151   0.125803  -2.195 0.030182 *
## HML         0.132527   0.164865   0.804 0.423157
## RMW         0.735058   0.210915   3.485 0.000699 ***
## CMA        -0.072708   0.227520  -0.320 0.749879
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.0217 on 114 degrees of freedom
## Multiple R-squared:  0.6884, Adjusted R-squared:  0.6748
## F-statistic: 50.38 on 5 and 114 DF,  p-value: < 2.2e-16

MM_VW_ff5_MOM_reg <- lm(formula="MM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(MM_VW_ff5_MOM_reg))
```

```
##
## Call:
## lm(formula = "MM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.045269 -0.013678 -0.001139  0.015019  0.078818
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.000885   0.002217  -0.399  0.690439
## MRRF         0.709409   0.056683  12.515 < 2e-16 ***
## SMB         -0.264666   0.127005  -2.084  0.039424 *
## HML          0.072041   0.184311   0.391  0.696630
## RMW          0.734241   0.211337   3.474  0.000727 ***
## CMA         -0.020768   0.238535  -0.087  0.930774
## MOM         -0.063209   0.085424  -0.740  0.460868
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02174 on 113 degrees of freedom
## Multiple R-squared:  0.6899, Adjusted R-squared:  0.6735
## F-statistic: 41.91 on 6 and 113 DF,  p-value: < 2.2e-16
```

EW MAT - High

```
MH_EW <- as.numeric(EW$MH_EW) - as.numeric(FAMA$RF)

#Regression
MH_EW_ff5reg <- lm(formula="MH_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(MH_EW_ff5reg))
```

```
##
## Call:
## lm(formula = "MH_EW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.044054 -0.015405 -0.000099  0.015602  0.070273
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.002632   0.002054  -1.281   0.2027
## MRRF         0.821291   0.054116  15.176 <2e-16 ***
```

```
## SMB      -0.020453   0.122440  -0.167   0.8676
## HML      0.307535   0.160458   1.917   0.0578 .
## RMW      0.480330   0.205277   2.340   0.0210 *
## CMA      -0.140040   0.221438  -0.632   0.5284
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02112 on 114 degrees of freedom
## Multiple R-squared:  0.7751, Adjusted R-squared:  0.7652
## F-statistic: 78.57 on 5 and 114 DF,  p-value: < 2.2e-16
```

```
MH_EW_ff5_MOM_reg <- lm(formula="MH_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(MH_EW_ff5_MOM_reg))
```

```
##
## Call:
## lm(formula = "MH_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.040127 -0.015032 -0.001137  0.015523  0.070232
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.001541   0.002135  -0.722   0.4719
## MRRF         0.804147   0.054604  14.727 <2e-16 ***
## SMB          0.005031   0.122347   0.041   0.9673
## HML          0.173323   0.177551   0.976   0.3311
## RMW          0.478518   0.203585   2.350   0.0205 *
## CMA         -0.024787   0.229785  -0.108   0.9143
## MOM         -0.140256   0.082290  -1.704   0.0911 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02094 on 113 degrees of freedom
## Multiple R-squared:  0.7807, Adjusted R-squared:  0.7691
## F-statistic: 67.05 on 6 and 113 DF,  p-value: < 2.2e-16
```

```
##### VW MAT - High #####
```

```
MH_VW <- as.numeric(VW$MH_VW) - as.numeric(FAMA$RF)
```

```
#Regression
```

```
MH_VW_ff5reg <- lm(formula="MH_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(MH_VW_ff5reg))
```

```
##
## Call:
## lm(formula = "MH_VW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.044401 -0.012654 -0.001835  0.013362  0.052559
```

```
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.0002482  0.0018160   0.137  0.89152
## MRRF         0.7392577  0.0478453  15.451 < 2e-16 ***
## SMB          -0.4048289  0.1082520  -3.740  0.00029 ***
## HML          -0.0519179  0.1418646  -0.366  0.71507
## RMW          0.3596371  0.1814898   1.982  0.04993 *
## CMA          0.1552587  0.1957783   0.793  0.42941
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01867 on 114 degrees of freedom
## Multiple R-squared:  0.7466, Adjusted R-squared:  0.7355
## F-statistic: 67.17 on 5 and 114 DF,  p-value: < 2.2e-16

MH_VW_ff5_MOM_reg <- lm(formula="MH_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(MH_VW_ff5_MOM_reg))
```

```
##
## Call:
## lm(formula = "MH_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.04285 -0.01290 -0.00224  0.01282  0.05254
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.0006619  0.0019075   0.347  0.729226
## MRRF         0.7327560  0.0487804  15.022 < 2e-16 ***
## SMB          -0.3951640  0.1092982  -3.615  0.000449 ***
## HML          -0.1028169  0.1586147  -0.648  0.518159
## RMW          0.3589500  0.1818728   1.974  0.050864 .
## CMA          0.1989672  0.2052784   0.969  0.334488
## MOM          -0.0531911  0.0735140  -0.724  0.470837
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01871 on 113 degrees of freedom
## Multiple R-squared:  0.7478, Adjusted R-squared:  0.7344
## F-statistic: 55.83 on 6 and 113 DF,  p-value: < 2.2e-16
```

```
#### Difference SASB Material Portfolios ####
# EW
ML_MH_EW_diff <- lm(formula="ML_EW-MH_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(ML_MH_EW_diff))
```

```
##
## Call:
## lm(formula = "ML_EW-MH_EW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
```



```
##           Min           1Q           Median           3Q           Max
## -0.037099 -0.008420  0.000622  0.008449  0.038880
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.002157  0.001269  1.700  0.09179 .
## MRRF        -0.024841  0.033428 -0.743  0.45893
## SMB         0.322234  0.075632  4.261 4.22e-05 ***
## HML        -0.277261  0.099116 -2.797  0.00605 **
## RMW         0.005509  0.126801  0.043  0.96542
## CMA        -0.003975  0.136784 -0.029  0.97686
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01305 on 114 degrees of freedom
## Multiple R-squared:  0.3603, Adjusted R-squared:  0.3323
## F-statistic: 12.84 on 5 and 114 DF,  p-value: 6.599e-10
```

```
MM_MH_EW_diff <- lm(formula="MM_EW-MH_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(MM_MH_EW_diff))
```

```
##
## Call:
## lm(formula = "MM_EW-MH_EW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##           Min           1Q           Median           3Q           Max
## -0.0298405 -0.0057930  0.0000873  0.0058813  0.0302954
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.001927  0.001087 -1.773  0.07893 .
## MRRF        -0.013845  0.028633 -0.484  0.62966
## SMB         0.263898  0.064784  4.073 8.59e-05 ***
## HML        -0.017569  0.084900 -0.207  0.83643
## RMW         0.303644  0.108614  2.796  0.00608 **
## CMA         0.070324  0.117165  0.600  0.54956
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01117 on 114 degrees of freedom
## Multiple R-squared:  0.2378, Adjusted R-squared:  0.2043
## F-statistic: 7.112 on 5 and 114 DF,  p-value: 7.996e-06
```

```
# WV
ML_MH_VW_diff <- lm(formula="ML_VW-MH_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(ML_MH_VW_diff))
```

```
##
## Call:
## lm(formula = "ML_VW-MH_VW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
```

```

##           Min           1Q       Median           3Q           Max
## -0.052469 -0.010004  0.000521  0.009737  0.035430
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.001428  0.001466  0.974  0.33213
## MRRF        -0.089005  0.038635 -2.304  0.02305 *
## SMB         0.254275  0.087414  2.909  0.00436 **
## HML        -0.011742  0.114556 -0.102  0.91854
## RMW         0.032123  0.146554  0.219  0.82690
## CMA        -0.249241  0.158092 -1.577  0.11767
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01508 on 114 degrees of freedom
## Multiple R-squared:  0.1989, Adjusted R-squared:  0.1638
## F-statistic: 5.662 on 5 and 114 DF,  p-value: 0.0001062

```

```

MM_MH_VW_diff <- lm(formula="MM_VW-MH_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(MM_MH_VW_diff))

```

```

##
## Call:
## lm(formula = "MM_VW-MH_VW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##           Min           1Q       Median           3Q           Max
## -0.025845 -0.007942 -0.000852  0.007633  0.049835
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.001625  0.001277 -1.272  0.20597
## MRRF        -0.022123  0.033657 -0.657  0.51231
## SMB         0.128678  0.076149  1.690  0.09380 .
## HML         0.184444  0.099794  1.848  0.06716 .
## RMW         0.375421  0.127668  2.941  0.00397 **
## CMA        -0.227967  0.137719 -1.655  0.10061
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01313 on 114 degrees of freedom
## Multiple R-squared:  0.1374, Adjusted R-squared:  0.09961
## F-statistic: 3.633 on 5 and 114 DF,  p-value: 0.004363

```

```

## Difference with MOM ##

```

```

# EW
ML_MH_EW_MOM_diff <- lm(formula="ML_EW-MH_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(ML_MH_EW_MOM_diff))

```

```

##
## Call:
## lm(formula = "ML_EW-MH_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##      data = FAMA)

```

```

##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.038344 -0.008015  0.001522  0.007558  0.037724
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.001731   0.001329   1.303   0.1953
## MRRF        -0.018147   0.033989  -0.534   0.5945
## SMB          0.312283   0.076156   4.101 7.8e-05 ***
## HML         -0.224852   0.110518  -2.035   0.0442 *
## RMW          0.006216   0.126723   0.049   0.9610
## CMA         -0.048981   0.143032  -0.342   0.7327
## MOM          0.054769   0.051222   1.069   0.2872
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01304 on 113 degrees of freedom
## Multiple R-squared:  0.3667, Adjusted R-squared:  0.3331
## F-statistic: 10.91 on 6 and 113 DF,  p-value: 1.482e-09

MM_MH_EW_MOM_diff <- lm(formula="MM_EW-MH_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(MM_MH_EW_MOM_diff))

##
## Call:
## lm(formula = "MM_EW-MH_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.0296913 -0.0063593  0.0002074  0.0061632  0.0299923
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.001533   0.001137  -1.348   0.18051
## MRRF        -0.020035   0.029089  -0.689   0.49240
## SMB          0.273100   0.065178   4.190 5.56e-05 ***
## HML         -0.066030   0.094587  -0.698   0.48656
## RMW          0.302990   0.108456   2.794   0.00612 **
## CMA          0.111939   0.122414   0.914   0.36244
## MOM         -0.050643   0.043839  -1.155   0.25044
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01116 on 113 degrees of freedom
## Multiple R-squared:  0.2467, Adjusted R-squared:  0.2067
## F-statistic: 6.167 on 6 and 113 DF,  p-value: 1.276e-05

# VW
ML_MH_VW_MOM_diff <- lm(formula="ML_VW-MH_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(ML_MH_VW_MOM_diff))

##

```

```
## Call:
## lm(formula = "ML_VW-MH_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.052241 -0.009957  0.000078  0.010163  0.034666
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.001127   0.001541   0.731  0.46614
## MRRF        -0.084268   0.039407  -2.138  0.03464 *
## SMB         0.247234   0.088297   2.800  0.00601 **
## HML         0.025342   0.128137   0.198  0.84358
## RMW         0.032623   0.146926   0.222  0.82469
## CMA        -0.281086   0.165835  -1.695  0.09283 .
## MOM         0.038753   0.059388   0.653  0.51538
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01512 on 113 degrees of freedom
## Multiple R-squared:  0.2019, Adjusted R-squared:  0.1596
## F-statistic: 4.765 on 6 and 113 DF,  p-value: 0.0002296
```

```
MM_MH_VW_MOM_diff <- lm(formula="MM_VW-MH_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(MM_MH_VW_MOM_diff))
```

```
##
## Call:
## lm(formula = "MM_VW-MH_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.025663 -0.008181 -0.001005  0.007610  0.049887
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.001547   0.001345  -1.150  0.25241
## MRRF        -0.023347   0.034388  -0.679  0.49857
## SMB         0.130498   0.077051   1.694  0.09308 .
## HML         0.174858   0.111817   1.564  0.12066
## RMW         0.375291   0.128212   2.927  0.00414 **
## CMA        -0.219735   0.144712  -1.518  0.13170
## MOM        -0.010018   0.051824  -0.193  0.84707
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01319 on 113 degrees of freedom
## Multiple R-squared:  0.1377, Adjusted R-squared:  0.09195
## F-statistic: 3.008 on 6 and 113 DF,  p-value: 0.009152
```

```
#### TR Portfolios ####
```

```
#### EW TR - Fail ####
```

```
TR_Fail_EW <- as.numeric(EW$TR_Fail_EW) - as.numeric(FAMA$RF)
```

```
#Regression
```

```
TR_Fail_EW_ff5reg <- lm(formula="TR_Fail_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)  
print(summary(TR_Fail_EW_ff5reg))
```

```
##
```

```
## Call:
```

```
## lm(formula = "TR_Fail_EW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
```

```
##
```

```
## Residuals:
```

```
##      Min       1Q   Median       3Q      Max  
## -0.04603 -0.01420 -0.00211  0.01622  0.04501
```

```
##
```

```
## Coefficients:
```

```
##              Estimate Std. Error t value Pr(>|t|)  
## (Intercept) -0.001645  0.001996  -0.824  0.41142  
## MRRF         0.816280  0.052578  15.525 < 2e-16 ***  
## SMB         0.342977  0.118960   2.883  0.00471 **  
## HML         0.061193  0.155898   0.393  0.69540  
## RMW         0.436678  0.199442   2.189  0.03060 *  
## CMA        -0.170458  0.215144  -0.792  0.42983
```

```
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
```

```
## Residual standard error: 0.02052 on 114 degrees of freedom
```

```
## Multiple R-squared:  0.772, Adjusted R-squared:  0.762
```

```
## F-statistic: 77.21 on 5 and 114 DF, p-value: < 2.2e-16
```

```
TR_Fail_EW_ff5_MOM_reg <- lm(formula="TR_Fail_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)  
print(summary(TR_Fail_EW_ff5_MOM_reg))
```

```
##
```

```
## Call:
```

```
## lm(formula = "TR_Fail_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",  
##     data = FAMA)
```

```
##
```

```
## Residuals:
```

```
##      Min       1Q   Median       3Q      Max  
## -0.047441 -0.014095 -0.002113  0.015061  0.047364
```

```
##
```

```
## Coefficients:
```

```
##              Estimate Std. Error t value Pr(>|t|)  
## (Intercept) -0.0004343  0.0020664  -0.210  0.83390  
## MRRF         0.7972496  0.0528435  15.087 < 2e-16 ***  
## SMB         0.3712656  0.1184020   3.136  0.00219 **  
## HML        -0.0877874  0.1718262  -0.511  0.61041
```

```
## RMW          0.4346667  0.1970216  2.206  0.02939 *
## CMA          -0.0425234  0.2223767  -0.191  0.84869
## MOM          -0.1556898  0.0796372  -1.955  0.05305 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02027 on 113 degrees of freedom
## Multiple R-squared:  0.7795, Adjusted R-squared:  0.7678
## F-statistic: 66.57 on 6 and 113 DF,  p-value: < 2.2e-16
```

```
##### VW TR - Fail #####
```

```
TR_Fail_VW <- as.numeric(VW$TR_Fail_VW) - as.numeric(FAMA$RF)
```

```
#Regression
```

```
TR_Fail_VW_ff5reg <- lm(formula="TR_Fail_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(TR_Fail_VW_ff5reg))
```

```
##
## Call:
## lm(formula = "TR_Fail_VW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.032849 -0.011758 -0.001775  0.011816  0.039296
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.001035   0.001660   0.623   0.534
## MRRF         0.631737   0.043724  14.448 <2e-16 ***
## SMB          0.015222   0.098927   0.154   0.878
## HML         -0.164362   0.129644  -1.268   0.207
## RMW          0.151531   0.165856   0.914   0.363
## CMA         -0.138859   0.178914  -0.776   0.439
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01706 on 114 degrees of freedom
## Multiple R-squared:  0.7174, Adjusted R-squared:  0.705
## F-statistic: 57.89 on 5 and 114 DF,  p-value: < 2.2e-16
```

```
TR_Fail_VW_ff5_MOM_reg <- lm(formula="TR_Fail_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(TR_Fail_VW_ff5_MOM_reg))
```

```
##
## Call:
## lm(formula = "TR_Fail_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.033146 -0.011712 -0.001947  0.011951  0.039409
##
```

```
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.001203  0.001746  0.689  0.492
## MRRF         0.629084  0.044661 14.086 <2e-16 ***
## SMB          0.019165  0.100068  0.192  0.848
## HML         -0.185127  0.145220 -1.275  0.205
## RMW          0.151251  0.166514  0.908  0.366
## CMA         -0.121027  0.187943 -0.644  0.521
## MOM         -0.021700  0.067306 -0.322  0.748
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01713 on 113 degrees of freedom
## Multiple R-squared:  0.7177, Adjusted R-squared:  0.7027
## F-statistic: 47.88 on 6 and 113 DF,  p-value: < 2.2e-16
```

```
#### EW TR - Low ####
```

```
TR_Low_EW <- as.numeric(EW$TR_Low_EW) - as.numeric(FAMA$RF)
```

```
#Regression
```

```
TR_Low_EW_ff5reg <- lm(formula="TR_Low_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(TR_Low_EW_ff5reg))
```

```
##
## Call:
## lm(formula = "TR_Low_EW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.043845 -0.014853 -0.001368  0.016821  0.066776
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.004331  0.002140  -2.024 0.045275 *
## MRRF         0.843994  0.056372 14.972 < 2e-16 ***
## SMB          0.076542  0.127543  0.600 0.549614
## HML          0.416798  0.167145  2.494 0.014080 *
## RMW          0.727995  0.213832  3.405 0.000916 ***
## CMA         -0.061196  0.230667 -0.265 0.791259
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.022 on 114 degrees of freedom
## Multiple R-squared:  0.7765, Adjusted R-squared:  0.7667
## F-statistic: 79.23 on 5 and 114 DF,  p-value: < 2.2e-16
```

```
TR_Low_EW_ff5_MOM_reg <- lm(formula="TR_Low_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(TR_Low_EW_ff5_MOM_reg))
```

```
##
## Call:
## lm(formula = "TR_Low_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
```

```
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.04424 -0.01531 -0.00143  0.01587  0.06673
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.003093   0.002219  -1.394  0.16606
## MRRF         0.824534   0.056743  14.531 < 2e-16 ***
## SMB          0.105470   0.127138   0.830  0.40853
## HML          0.264453   0.184504   1.433  0.15453
## RMW          0.725939   0.211559   3.431  0.00084 ***
## CMA          0.069628   0.238785   0.292  0.77113
## MOM         -0.159206   0.085513  -1.862  0.06523 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02176 on 113 degrees of freedom
## Multiple R-squared:  0.7832, Adjusted R-squared:  0.7717
## F-statistic: 68.03 on 6 and 113 DF,  p-value: < 2.2e-16
```

```
##### VW TR - Low #####
```

```
TR_Low_VW <- as.numeric(VW$TR_Low_VW) - as.numeric(FAMA$RF)
```

```
#Regression
```

```
TR_Low_VW_ff5reg <- lm(formula="TR_Low_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(TR_Low_VW_ff5reg))
```

```
##
## Call:
## lm(formula = "TR_Low_VW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.041554 -0.013007 -0.002911  0.013737  0.055703
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.001755   0.001966  -0.893  0.37391
## MRRF         0.747679   0.051792  14.436 < 2e-16 ***
## SMB         -0.360231   0.117182  -3.074  0.00264 **
## HML          0.052336   0.153567   0.341  0.73388
## RMW          0.622563   0.196461   3.169  0.00196 **
## CMA          0.167309   0.211928   0.789  0.43148
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02021 on 114 degrees of freedom
## Multiple R-squared:  0.7263, Adjusted R-squared:  0.7143
## F-statistic: 60.5 on 5 and 114 DF,  p-value: < 2.2e-16
```



```
TR_Low_VW_ff5_MOM_reg <- lm(formula="TR_Low_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(TR_Low_VW_ff5_MOM_reg))
```

```
##
## Call:
## lm(formula = "TR_Low_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.041874 -0.013229 -0.003972  0.013102  0.055693
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.001481   0.002068  -0.716  0.47545
## MRRF         0.743370   0.052881  14.057 < 2e-16 ***
## SMB         -0.353825   0.118485  -2.986  0.00346 **
## HML          0.018602   0.171947   0.108  0.91404
## RMW          0.622108   0.197160   3.155  0.00205 **
## CMA          0.196277   0.222533   0.882  0.37964
## MOM         -0.035253   0.079693  -0.442  0.65908
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02028 on 113 degrees of freedom
## Multiple R-squared:  0.7268, Adjusted R-squared:  0.7123
## F-statistic:  50.1 on 6 and 113 DF,  p-value: < 2.2e-16
```

```
#### EW TR - High ####
```

```
TR_High_EW <- as.numeric(EW$TR_High_EW) - as.numeric(FAMA$RF)
```

```
#Regression
```

```
TR_High_EW_ff5reg <- lm(formula="TR_High_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(TR_High_EW_ff5reg))
```

```
##
## Call:
## lm(formula = "TR_High_EW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.043024 -0.013743  0.000849  0.013312  0.053459
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.002375   0.001912  -1.243  0.21656
## MRRF         0.782581   0.050365  15.538 < 2e-16 ***
## SMB          0.046113   0.113952   0.405  0.68648
## HML          0.178208   0.149335   1.193  0.23521
## RMW          0.601901   0.191046   3.151  0.00208 **
## CMA         -0.123480   0.206087  -0.599  0.55025
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01965 on 114 degrees of freedom
## Multiple R-squared:  0.7693, Adjusted R-squared:  0.7592
## F-statistic: 76.04 on 5 and 114 DF,  p-value: < 2.2e-16

TR_High_EW_ff5_MOM_reg <- lm(formula="TR_High_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(TR_High_EW_ff5_MOM_reg))
```

```
##
## Call:
## lm(formula = "TR_High_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.03982 -0.01374  0.00050  0.01213  0.05403
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.001520   0.001995  -0.762  0.44751
## MRRF         0.769143   0.051008  15.079 < 2e-16 ***
## SMB          0.066089   0.114290   0.578  0.56424
## HML          0.073010   0.165859   0.440  0.66064
## RMW          0.600481   0.190179   3.157  0.00204 **
## CMA         -0.033143   0.214654  -0.154  0.87757
## MOM         -0.109936   0.076871  -1.430  0.15544
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01957 on 113 degrees of freedom
## Multiple R-squared:  0.7734, Adjusted R-squared:  0.7614
## F-statistic: 64.29 on 6 and 113 DF,  p-value: < 2.2e-16
```

```
##### VW TR - High #####
TR_High_VW <- as.numeric(VW$TR_High_VW) - as.numeric(FAMA$RF)

#Regression
TR_High_VW_ff5reg <- lm(formula="TR_High_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(TR_High_VW_ff5reg))
```

```
##
## Call:
## lm(formula = "TR_High_VW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.041735 -0.011334  0.000289  0.011482  0.044796
##
## Coefficients:
```

```
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.001218  0.001806   0.674 0.501411
## MRRF         0.724589  0.047591  15.225 < 2e-16 ***
## SMB         -0.400892  0.107676  -3.723 0.000307 ***
## HML         0.027890  0.141109   0.198 0.843670
## RMW         0.481146  0.180523   2.665 0.008809 **
## CMA         0.001271  0.194736   0.007 0.994804
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01857 on 114 degrees of freedom
## Multiple R-squared:  0.7476, Adjusted R-squared:  0.7366
## F-statistic: 67.55 on 5 and 114 DF,  p-value: < 2.2e-16

TR_High_VW_ff5_MOM_reg <- lm(formula="TR_High_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(TR_High_VW_ff5_MOM_reg))
```

```
##
## Call:
## lm(formula = "TR_High_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.041296 -0.010713  0.000311  0.011674  0.045183
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.001796  0.001893   0.949 0.344798
## MRRF         0.715509  0.048411  14.780 < 2e-16 ***
## SMB        -0.387395  0.108471  -3.571 0.000523 ***
## HML        -0.043191  0.157415  -0.274 0.784294
## RMW         0.480186  0.180497   2.660 0.008941 **
## CMA         0.062311  0.203725   0.306 0.760275
## MOM        -0.074283  0.072958  -1.018 0.310777
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01857 on 113 degrees of freedom
## Multiple R-squared:  0.7499, Adjusted R-squared:  0.7367
## F-statistic: 56.48 on 6 and 113 DF,  p-value: < 2.2e-16
```

```
#### Difference TR Portfolios ####
# EW
TRF_TRH_EW_diff <- lm(formula="TR_Fail_EW-TR_High_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(TRF_TRH_EW_diff))
```

```
##
## Call:
## lm(formula = "TR_Fail_EW-TR_High_EW ~ MRRF + SMB + HML+ RMW + CMA",
##     data = FAMA)
##
## Residuals:
```

```
##           Min           1Q       Median           3Q           Max
## -0.024137 -0.007199 -0.001002  0.006359  0.037142
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.0007302  0.0010439   0.699   0.486
## MRRF         0.0336992  0.0275040   1.225   0.223
## SMB          0.2968634  0.0622289   4.771 5.49e-06 ***
## HML         -0.1170148  0.0815512  -1.435   0.154
## RMW         -0.1652233  0.1043299  -1.584   0.116
## CMA         -0.0469776  0.1125437  -0.417   0.677
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01073 on 114 degrees of freedom
## Multiple R-squared:  0.2384, Adjusted R-squared:  0.205
## F-statistic: 7.136 on 5 and 114 DF,  p-value: 7.666e-06
```

```
TRL_TRH_EW_diff <- lm(formula="TR_Low_EW-TR_High_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(TRL_TRH_EW_diff))
```

```
##
## Call:
## lm(formula = "TR_Low_EW-TR_High_EW ~ MRRF + SMB + HML+ RMW + CMA",
##     data = FAMA)
##
## Residuals:
##           Min           1Q       Median           3Q           Max
## -0.022172 -0.006586 -0.001465  0.007444  0.025278
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.0019558  0.0009265  -2.111  0.03696 *
## MRRF         0.0614133  0.0244112   2.516  0.01327 *
## SMB          0.0304285  0.0552313   0.551  0.58276
## HML          0.2385902  0.0723808   3.296  0.00131 **
## RMW          0.1260940  0.0925980   1.362  0.17597
## CMA          0.0622848  0.0998881   0.624  0.53417
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.009526 on 114 degrees of freedom
## Multiple R-squared:  0.3769, Adjusted R-squared:  0.3495
## F-statistic: 13.79 on 5 and 114 DF,  p-value: 1.579e-10
```

```
# VW
TRF_TRH_VW_diff <- lm(formula="TR_Fail_VW-TR_High_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(TRF_TRH_VW_diff))
```

```
##
## Call:
## lm(formula = "TR_Fail_VW-TR_High_VW ~ MRRF + SMB + HML+ RMW + CMA",
##     data = FAMA)
```

```

##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.041039 -0.006788 -0.001199  0.006615  0.025904
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.0001837  0.0011160  -0.165  0.86955
## MRRF        -0.0928526  0.0294021  -3.158  0.00203 **
## SMB         0.4161139  0.0665235   6.255 7.15e-09 ***
## HML        -0.1922519  0.0871792  -2.205  0.02944 *
## RMW        -0.3296146  0.1115299  -2.955  0.00380 **
## CMA        -0.1401303  0.1203105  -1.165  0.24656
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01147 on 114 degrees of freedom
## Multiple R-squared:  0.4275, Adjusted R-squared:  0.4024
## F-statistic: 17.02 on 5 and 114 DF,  p-value: 1.513e-12

TRL_TRH_VW_diff <- lm(formula="TR_Low_VW-TR_High_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(TRL_TRH_VW_diff))

```

```

##
## Call:
## lm(formula = "TR_Low_VW-TR_High_VW ~ MRRF + SMB + HML+ RMW + CMA",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.0251223 -0.0081913 -0.0001185  0.0067374  0.0260658
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.002973  0.001063  -2.796  0.00607 **
## MRRF         0.023090  0.028014   0.824  0.41153
## SMB         0.040661  0.063382   0.642  0.52247
## HML         0.024446  0.083063   0.294  0.76906
## RMW         0.141418  0.106264   1.331  0.18591
## CMA         0.166038  0.114630   1.448  0.15023
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01093 on 114 degrees of freedom
## Multiple R-squared:  0.04412, Adjusted R-squared:  0.0022
## F-statistic: 1.052 on 5 and 114 DF,  p-value: 0.3906

```

```
## Difference with MOM ##
```

```
# EW
```

```
TRF_TRH_EW_MOM_diff <- lm(formula="TR_Fail_EW-TR_High_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(TRF_TRH_EW_MOM_diff))
```

```
##
```

```

## Call:
## lm(formula = "TR_Fail_EW-TR_High_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.023558 -0.007975 -0.000408  0.006006  0.034629
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.001086   0.001093   0.993  0.3227
## MRRF         0.028107   0.027961   1.005  0.3169
## SMB          0.305177   0.062650   4.871 3.64e-06 ***
## HML         -0.160797   0.090918  -1.769  0.0797 .
## RMW         -0.165814   0.104250  -1.591  0.1145
## CMA         -0.009380   0.117666  -0.080  0.9366
## MOM         -0.045754   0.042138  -1.086  0.2799
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01073 on 113 degrees of freedom
## Multiple R-squared:  0.2462, Adjusted R-squared:  0.2062
## F-statistic: 6.153 on 6 and 113 DF,  p-value: 1.313e-05

```

```

TRL_TRH_EW_MOM_diff <- lm(formula="TR_Low_EW-TR_High_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(TRL_TRH_EW_MOM_diff))

```

```

##
## Call:
## lm(formula = "TR_Low_EW-TR_High_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.022921 -0.006842 -0.001169  0.007301  0.022572
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.001573   0.000968  -1.625  0.1070
## MRRF         0.055391   0.024756   2.238  0.0272 *
## SMB          0.039381   0.055468   0.710  0.4792
## HML          0.191443   0.080495   2.378  0.0191 *
## RMW          0.125458   0.092299   1.359  0.1768
## CMA          0.102771   0.104177   0.987  0.3260
## MOM         -0.049270   0.037308  -1.321  0.1893
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.009496 on 113 degrees of freedom
## Multiple R-squared:  0.3863, Adjusted R-squared:  0.3537
## F-statistic: 11.86 on 6 and 113 DF,  p-value: 2.766e-10

```

```
# VW
TRF_TRH_VW_MOM_diff <- lm(formula="TR_Fail_VW-TR_High_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(TRF_TRH_VW_MOM_diff))
```

```
##
## Call:
## lm(formula = "TR_Fail_VW-TR_High_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.039803 -0.006659 -0.001174  0.006475  0.026309
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.0005927  0.0011679  -0.507  0.61282
## MRRF         -0.0864253  0.0298663  -2.894  0.00457 **
## SMB           0.4065596  0.0669189   6.075 1.71e-08 ***
## HML          -0.1419355  0.0971134  -1.462  0.14664
## RMW          -0.3289354  0.1113534  -2.954  0.00382 **
## CMA          -0.1833385  0.1256837  -1.459  0.14741
## MOM           0.0525822  0.0450097   1.168  0.24517
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01146 on 113 degrees of freedom
## Multiple R-squared:  0.4343, Adjusted R-squared:  0.4043
## F-statistic: 14.46 on 6 and 113 DF,  p-value: 3.482e-12
```

```
TRL_TRH_VW_MOM_diff <- lm(formula="TR_Low_VW-TR_High_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(TRL_TRH_VW_MOM_diff))
```

```
##
## Call:
## lm(formula = "TR_Low_VW-TR_High_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.0241550 -0.0079694 -0.0001713  0.0062193  0.0270450
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.003277  0.001115  -2.938  0.00401 **
## MRRF         0.027860  0.028524   0.977  0.33078
## SMB           0.033569  0.063910   0.525  0.60043
## HML           0.061794  0.092747   0.666  0.50660
## RMW           0.141922  0.106347   1.335  0.18472
## CMA           0.133966  0.120033   1.116  0.26676
## MOM           0.039030  0.042986   0.908  0.36583
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
## Residual standard error: 0.01094 on 113 degrees of freedom
## Multiple R-squared: 0.05105, Adjusted R-squared: 0.0006603
## F-statistic: 1.013 on 6 and 113 DF, p-value: 0.4205
```

```
#### Combined Portfolios ####
```

```
#### EW High TR - Low Mat ####
```

```
HTR_LM_EW <- as.numeric(EW$HTR_LM_EW) - as.numeric(FAMA$RF)
```

```
#Regression
```

```
HTR_LM_EW_ff5reg <- lm(formula="HTR_LM_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(HTR_LM_EW_ff5reg))
```

```
##
## Call:
## lm(formula = "HTR_LM_EW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.055247 -0.015581 -0.001264  0.015413  0.070886
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.001863   0.002359  -0.790  0.43134
## MRRF         0.786558   0.062156  12.655 < 2e-16 ***
## SMB         0.192998   0.140631   1.372  0.17264
## HML         0.032542   0.184297   0.177  0.86016
## RMW         0.787479   0.235774   3.340  0.00113 **
## CMA         0.070199   0.254336   0.276  0.78304
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02426 on 114 degrees of freedom
## Multiple R-squared: 0.6749, Adjusted R-squared: 0.6607
## F-statistic: 47.34 on 5 and 114 DF, p-value: < 2.2e-16
```

```
HTR_LM_EW_ff5_MOM_reg <- lm(formula="HTR_LM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(HTR_LM_EW_ff5_MOM_reg))
```

```
##
## Call:
## lm(formula = "HTR_LM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.055888 -0.015177 -0.000857  0.015122  0.069566
##
## Coefficients:
```



```
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.001499  0.002481  -0.604  0.54686
## MRRF        0.780843  0.063450  12.306 < 2e-16 ***
## SMB         0.201494  0.142168   1.417  0.15915
## HML        -0.012200  0.206316  -0.059  0.95295
## RMW         0.786875  0.236568   3.326  0.00119 **
## CMA         0.108621  0.267013   0.407  0.68492
## MOM        -0.046758  0.095622  -0.489  0.62580
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02434 on 113 degrees of freedom
## Multiple R-squared:  0.6756, Adjusted R-squared:  0.6584
## F-statistic: 39.22 on 6 and 113 DF,  p-value: < 2.2e-16
```

VW High TR - Low Mat

```
HTR_LM_VW <- as.numeric(VW$HTR_LM_VW) - as.numeric(FAMA$RF)
```

#Regression

```
HTR_LM_VW_ff5reg <- lm(formula="HTR_LM_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(HTR_LM_VW_ff5reg))
```

```
##
## Call:
## lm(formula = "HTR_LM_VW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.063670 -0.019512  0.000973  0.017811  0.067577
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.0012365  0.0025807   0.479  0.63277
## MRRF         0.7524385  0.0679951  11.066 < 2e-16 ***
## SMB         -0.4639639  0.1538415  -3.016  0.00316 **
## HML          0.0255599  0.2016098   0.127  0.89934
## RMW          0.7568780  0.2579229   2.935  0.00404 **
## CMA          0.0004701  0.2782289   0.002  0.99865
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02654 on 114 degrees of freedom
## Multiple R-squared:  0.6122, Adjusted R-squared:  0.5952
## F-statistic: 35.99 on 5 and 114 DF,  p-value: < 2.2e-16
```

```
HTR_LM_VW_ff5_MOM_reg <- lm(formula="HTR_LM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(HTR_LM_VW_ff5_MOM_reg))
```

```
##
## Call:
## lm(formula = "HTR_LM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
```

```

##      data = FAMA)
##
## Residuals:
##      Min        1Q      Median        3Q        Max
## -0.063810 -0.020711  0.001321  0.017609  0.065479
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.001814   0.002711   0.669  0.50470
## MRRF         0.743357   0.069329  10.722 < 2e-16 ***
## SMB         -0.450464   0.155341  -2.900  0.00449 **
## HML         -0.045533   0.225432  -0.202  0.84029
## RMW         0.755918   0.258488   2.924  0.00417 **
## CMA         0.061520   0.291753   0.211  0.83337
## MOM        -0.074295   0.104482  -0.711  0.47850
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02659 on 113 degrees of freedom
## Multiple R-squared:  0.6139, Adjusted R-squared:  0.5934
## F-statistic: 29.95 on 6 and 113 DF,  p-value: < 2.2e-16

```

EW High TR - High Mat

```
HTR_HM_EW <- as.numeric(EW$HTR_HM_EW) - as.numeric(FAMA$RF)
```

#Regression

```
HTR_HM_EW_ff5reg <- lm(formula="HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(HTR_HM_EW_ff5reg))
```

```

##
## Call:
## lm(formula = "HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min        1Q      Median        3Q        Max
## -0.046502 -0.012644 -0.000045  0.014939  0.049485
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.001125   0.001875  -0.600  0.5496
## MRRF         0.748286   0.049398  15.148 <2e-16 ***
## SMB         -0.111296   0.111764  -0.996  0.3215
## HML         0.061730   0.146468   0.421  0.6742
## RMW         0.318648   0.187379   1.701  0.0918 .
## CMA        -0.145757   0.202131  -0.721  0.4723
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01928 on 114 degrees of freedom
## Multiple R-squared:  0.752, Adjusted R-squared:  0.7411
## F-statistic: 69.12 on 5 and 114 DF,  p-value: < 2.2e-16

```

```
HTR_HM_EW_ff5_MOM_reg <- lm(formula="HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(HTR_HM_EW_ff5_MOM_reg))
```

```
##
## Call:
## lm(formula = "HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.050158 -0.012489 -0.001338  0.015189  0.049466
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.0006075  0.0019672  -0.309   0.758
## MRRF         0.7401504  0.0503085  14.712 <2e-16 ***
## SMB         -0.0992014  0.1127220  -0.880   0.381
## HML         -0.0019619  0.1635833  -0.012   0.990
## RMW         0.3177882  0.1875699   1.694   0.093 .
## CMA         -0.0910626  0.2117087  -0.430   0.668
## MOM         -0.0665605  0.0758168  -0.878   0.382
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.0193 on 113 degrees of freedom
## Multiple R-squared:  0.7536, Adjusted R-squared:  0.7406
## F-statistic: 57.62 on 6 and 113 DF,  p-value: < 2.2e-16
```

```
##### VW High TR - High Mat #####
```

```
HTR_HM_VW <- as.numeric(VW$HTR_HM_VW) - as.numeric(FAMA$RF)
```

```
#Regression
```

```
HTR_HM_VW_ff5reg <- lm(formula="HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(HTR_HM_VW_ff5reg))
```

```
##
## Call:
## lm(formula = "HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.047343 -0.013277 -0.000161  0.010841  0.046851
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.001800  0.001872   0.962   0.338
## MRRF         0.695648  0.049320  14.105 < 2e-16 ***
## SMB         -0.470916  0.111589  -4.220 4.93e-05 ***
```

```

## HML          -0.122164   0.146238  -0.835   0.405
## RMW          0.245006   0.187085   1.310   0.193
## CMA          0.132180   0.201814   0.655   0.514
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01925 on 114 degrees of freedom
## Multiple R-squared:  0.7073, Adjusted R-squared:  0.6944
## F-statistic: 55.09 on 5 and 114 DF,  p-value: < 2.2e-16

HTR_HM_VW_ff5_MOM_reg <- lm(formula="HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(HTR_HM_VW_ff5_MOM_reg))

```

```

##
## Call:
## lm(formula = "HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.045225 -0.013014  0.000532  0.011576  0.047357
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.002366   0.001963   1.205   0.231
## MRRF         0.686764   0.050196  13.682 < 2e-16 ***
## SMB         -0.457711   0.112470  -4.070 8.76e-05 ***
## HML         -0.191707   0.163218  -1.175   0.243
## RMW         0.244067   0.187151   1.304   0.195
## CMA         0.191900   0.211235   0.908   0.366
## MOM        -0.072675   0.075647  -0.961   0.339
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01925 on 113 degrees of freedom
## Multiple R-squared:  0.7096, Adjusted R-squared:  0.6942
## F-statistic: 46.03 on 6 and 113 DF,  p-value: < 2.2e-16

```

```

#### EW Low TR - Medium Mat ####
LTR_MM_EW <- as.numeric(EW$LTR_MM_EW) - as.numeric(FAMA$RF)

#Regression

LTR_MM_EW_ff5reg <- lm(formula="LTR_MM_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(LTR_MM_EW_ff5reg))

```

```

##
## Call:
## lm(formula = "LTR_MM_EW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max

```

```
## -0.044498 -0.015212 0.000038 0.015670 0.070420
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.005640  0.002258  -2.498 0.013918 *
## MRRF        0.814797  0.059491  13.696 < 2e-16 ***
## SMB         0.189673  0.134600   1.409 0.161511
## HML         0.422734  0.176394   2.397 0.018178 *
## RMW         0.887592  0.225664   3.933 0.000144 ***
## CMA        -0.029746  0.243430  -0.122 0.902959
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02322 on 114 degrees of freedom
## Multiple R-squared:  0.7448, Adjusted R-squared:  0.7336
## F-statistic: 66.54 on 5 and 114 DF,  p-value: < 2.2e-16

LTR_MM_EW_ff5_MOM_reg <- lm(formula="LTR_MM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(LTR_MM_EW_ff5_MOM_reg))
```

```
##
## Call:
## lm(formula = "LTR_MM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.044078 -0.015734 -0.001803  0.016097  0.071299
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.004331  0.002341  -1.850 0.066994 .
## MRRF        0.794213  0.059878  13.264 < 2e-16 ***
## SMB         0.220271  0.134164   1.642 0.103410
## HML         0.261589  0.194700   1.344 0.181786
## RMW         0.885417  0.223249   3.966 0.000129 ***
## CMA         0.108634  0.251980   0.431 0.667201
## MOM        -0.168401  0.090239  -1.866 0.064609 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02297 on 113 degrees of freedom
## Multiple R-squared:  0.7524, Adjusted R-squared:  0.7393
## F-statistic: 57.24 on 6 and 113 DF,  p-value: < 2.2e-16
```

```
##### VW Low TR - Medium Mat #####
```

```
LTR_MM_VW <- as.numeric(VW$LTR_MM_VW) - as.numeric(FAMA$RF)
```

```
#Regression
```

```
LTR_MM_VW_ff5reg <- lm(formula="LTR_MM_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(LTR_MM_VW_ff5reg))
```

```
##
## Call:
## lm(formula = "LTR_MM_VW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.065197 -0.013445 -0.000659  0.013313  0.087582
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.002039   0.002313  -0.882  0.37986
## MRRF         0.649912   0.060951  10.663 < 2e-16 ***
## SMB         -0.451388   0.137903  -3.273  0.00141 **
## HML          0.236970   0.180723   1.311  0.19241
## RMW          0.971859   0.231202   4.204 5.25e-05 ***
## CMA          0.062127   0.249404   0.249  0.80373
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02379 on 114 degrees of freedom
## Multiple R-squared:  0.6226, Adjusted R-squared:  0.6061
## F-statistic: 37.62 on 5 and 114 DF,  p-value: < 2.2e-16
```

```
LTR_MM_VW_ff5_MOM_reg <- lm(formula="LTR_MM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(LTR_MM_VW_ff5_MOM_reg))
```

```
##
## Call:
## lm(formula = "LTR_MM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.065289 -0.013592 -0.000794  0.013712  0.087635
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.001961   0.002435  -0.805  0.42249
## MRRF         0.648673   0.062283  10.415 < 2e-16 ***
## SMB         -0.449547   0.139551  -3.221  0.00167 **
## HML          0.227275   0.202518   1.122  0.26414
## RMW          0.971729   0.232214   4.185 5.67e-05 ***
## CMA          0.070453   0.262098   0.269  0.78857
## MOM         -0.010132   0.093862  -0.108  0.91423
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02389 on 113 degrees of freedom
## Multiple R-squared:  0.6227, Adjusted R-squared:  0.6026
## F-statistic: 31.08 on 6 and 113 DF,  p-value: < 2.2e-16
```

```
#### EW Fail TR - Low Mat ####
```

```
FTR_LM_EW <- as.numeric(EW$FTR_LM_EW) - as.numeric(FAMA$RF)
```

```
#Regression
```

```
FTR_LM_EW_ff5reg <- lm(formula="FTR_LM_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)  
print(summary(FTR_LM_EW_ff5reg))
```

```
##  
## Call:  
## lm(formula = "FTR_LM_EW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)  
##  
## Residuals:  
##      Min       1Q   Median       3Q      Max   
## -0.05100 -0.01529 -0.00264  0.01497  0.05557   
##  
## Coefficients:  
##              Estimate Std. Error t value Pr(>|t|)      
## (Intercept)  0.0003387  0.0020768   0.163  0.87075      
## MRRF         0.8335333  0.0547173  15.233 < 2e-16 ***   
## SMB          0.3427260  0.1238000   2.768  0.00658 **    
## HML         -0.1681590  0.1622403  -1.036  0.30217      
## RMW          0.3156524  0.2075569   1.521  0.13108      
## CMA         -0.0745747  0.2238976  -0.333  0.73969      
## ---  
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
##  
## Residual standard error: 0.02135 on 114 degrees of freedom  
## Multiple R-squared:  0.7487, Adjusted R-squared:  0.7376   
## F-statistic: 67.91 on 5 and 114 DF,  p-value: < 2.2e-16
```

```
FTR_LM_EW_ff5_MOM_reg <- lm(formula="FTR_LM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)  
print(summary(FTR_LM_EW_ff5_MOM_reg))
```

```
##  
## Call:  
## lm(formula = "FTR_LM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",  
##      data = FAMA)  
##  
## Residuals:  
##      Min       1Q   Median       3Q      Max   
## -0.051927 -0.014940 -0.002809  0.014480  0.057115   
##  
## Coefficients:  
##              Estimate Std. Error t value Pr(>|t|)      
## (Intercept)  0.001131  0.002172   0.521  0.60353      
## MRRF         0.821076  0.055553  14.780 < 2e-16 ***   
## SMB          0.361244  0.124472   2.902  0.00446 **    
## HML         -0.265680  0.180635  -1.471  0.14412      
## RMW          0.314336  0.207122   1.518  0.13190
```

```
## CMA          0.009170  0.233777  0.039  0.96878
## MOM          -0.101913  0.083720  -1.217  0.22603
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02131 on 113 degrees of freedom
## Multiple R-squared:  0.7519, Adjusted R-squared:  0.7387
## F-statistic: 57.08 on 6 and 113 DF,  p-value: < 2.2e-16
```

```
##### VW Fail TR - Low Mat #####
```

```
FTR_LM_VW <- as.numeric(VW$FTR_LM_VW) - as.numeric(FAMA$RF)
```

```
#Regression
```

```
FTR_LM_VW_ff5reg <- lm(formula="FTR_LM_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(FTR_LM_VW_ff5reg))
```

```
##
## Call:
## lm(formula = "FTR_LM_VW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.036417 -0.011398 -0.002484  0.008215  0.050406
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.001982   0.001728   1.147  0.2539
## MRRF         0.571425   0.045541  12.548 <2e-16 ***
## SMB          0.113465   0.103037   1.101  0.2731
## HML         -0.312631   0.135031  -2.315  0.0224 *
## RMW         -0.039642   0.172747  -0.229  0.8189
## CMA          0.011541   0.186347   0.062  0.9507
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01777 on 114 degrees of freedom
## Multiple R-squared:  0.6429, Adjusted R-squared:  0.6273
## F-statistic: 41.05 on 5 and 114 DF,  p-value: < 2.2e-16
```

```
FTR_LM_VW_ff5_MOM_reg <- lm(formula="FTR_LM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(FTR_LM_VW_ff5_MOM_reg))
```

```
##
## Call:
## lm(formula = "FTR_LM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.036526 -0.011323 -0.002292  0.008156  0.050143
```



```
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.002075   0.001820   1.141  0.2564
## MRRF         0.569961   0.046532  12.249 <2e-16 ***
## SMB          0.115641   0.104260   1.109  0.2697
## HML         -0.324094   0.151304  -2.142  0.0343 *
## RMW         -0.039797   0.173490  -0.229  0.8190
## CMA          0.021384   0.195817   0.109  0.9132
## MOM         -0.011979   0.070126  -0.171  0.8647
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01785 on 113 degrees of freedom
## Multiple R-squared:  0.643, Adjusted R-squared:  0.6241
## F-statistic: 33.92 on 6 and 113 DF, p-value: < 2.2e-16
```

EW Fail TR - High Mat

```
FTR_HM_EW <- as.numeric(EW$FTR_HM_EW) - as.numeric(FAMA$RF)
```

#Regression

```
FTR_HM_EW_ff5reg <- lm(formula="FTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(FTR_HM_EW_ff5reg))
```

```
##
## Call:
## lm(formula = "FTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.062117 -0.018166  0.001706  0.016957  0.073088
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.000635   0.002644  -0.240  0.8106
## MRRF         0.796211   0.069660  11.430 <2e-16 ***
## SMB          0.002972   0.157608   0.019  0.9850
## HML          0.382643   0.206545   1.853  0.0665 .
## RMW          0.282448   0.264237   1.069  0.2874
## CMA         -0.411500   0.285040  -1.444  0.1516
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02718 on 114 degrees of freedom
## Multiple R-squared:  0.6824, Adjusted R-squared:  0.6685
## F-statistic: 48.99 on 5 and 114 DF, p-value: < 2.2e-16
```

```
FTR_HM_EW_ff5_MOM_reg <- lm(formula="FTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
print(summary(FTR_HM_EW_ff5_MOM_reg))
```

```
##
```

```

## Call:
## lm(formula = "FTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.059973 -0.018436  0.000889  0.017675  0.073053
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.0002843  0.0027686   0.103   0.918
## MRRF         0.7817634  0.0708020  11.042 <2e-16 ***
## SMB         0.0244488  0.1586401   0.154   0.878
## HML         0.2695384  0.2302201   1.171   0.244
## RMW         0.2809209  0.2639778   1.064   0.290
## CMA        -0.3143728  0.2979497  -1.055   0.294
## MOM        -0.1181982  0.1067013  -1.108   0.270
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02716 on 113 degrees of freedom
## Multiple R-squared:  0.6858, Adjusted R-squared:  0.6691
## F-statistic: 41.11 on 6 and 113 DF,  p-value: < 2.2e-16

```

```
##### VW Fail TR - High Mat #####
```

```
FTR_HM_VW <- as.numeric(VW$FTR_HM_VW) - as.numeric(FAMA$RF)
```

```
#Regression
```

```
FTR_HM_VW_ff5reg <- lm(formula="FTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(FTR_HM_VW_ff5reg))
```

```

##
## Call:
## lm(formula = "FTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA", data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.072576 -0.019674 -0.002173  0.018264  0.087056
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.001718  0.002765   0.621   0.5357
## MRRF         0.797815  0.072840  10.953 <2e-16 ***
## SMB        -0.376491  0.164802  -2.284   0.0242 *
## HML         0.088911  0.215974   0.412   0.6814
## RMW         0.399565  0.276299   1.446   0.1509
## CMA        -0.181478  0.298052  -0.609   0.5438
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02843 on 114 degrees of freedom

```

```
## Multiple R-squared: 0.6146, Adjusted R-squared: 0.5977
## F-statistic: 36.35 on 5 and 114 DF, p-value: < 2.2e-16
```

```
FTR_HM_VW_ff5_MOM_reg <- lm(formula="FTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=FAMA)
summary(FTR_HM_VW_ff5_MOM_reg)
```

```
##
## Call:
## lm(formula = "FTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.073371 -0.020275 -0.000713  0.017827  0.081621
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.002335   0.002904   0.804   0.4231
## MRRF         0.788109   0.074270  10.611 <2e-16 ***
## SMB         -0.362064   0.166410  -2.176  0.0317 *
## HML         0.012933   0.241496   0.054  0.9574
## RMW         0.398540   0.276907   1.439  0.1528
## CMA        -0.116234   0.312543  -0.372  0.7107
## MOM        -0.079399   0.111927  -0.709  0.4796
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02849 on 113 degrees of freedom
## Multiple R-squared: 0.6163, Adjusted R-squared: 0.5959
## F-statistic: 30.25 on 6 and 113 DF, p-value: < 2.2e-16
```

```
#### Difference Combined Portfolios ####
```

```
# EW
```

```
HTR_LM_HTR_HM_EW_diff <- lm(formula="HTR_LM_EW-HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(HTR_LM_HTR_HM_EW_diff))
```

```
##
## Call:
## lm(formula = "HTR_LM_EW-HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.045612 -0.009791 -0.000679  0.010683  0.063601
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.0007378  0.0019156  -0.385  0.70082
## MRRF         0.0382720  0.0504698   0.758  0.44983
## SMB         0.3042937  0.1141899   2.665  0.00882 **
## HML        -0.0291881  0.1496463  -0.195  0.84570
## RMW         0.4688307  0.1914451   2.449  0.01585 *
## CMA         0.2159564  0.2065174   1.046  0.29791
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.0197 on 114 degrees of freedom
## Multiple R-squared:  0.131, Adjusted R-squared:  0.09285
## F-statistic: 3.436 on 5 and 114 DF,  p-value: 0.006272

FTR_LM_HTR_HM_EW_diff <- lm(formula="FTR_LM_EW-HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(FTR_LM_HTR_HM_EW_diff))
```

```
##
## Call:
## lm(formula = "FTR_LM_EW-HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.041157 -0.009948 -0.000906  0.009418  0.059151
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.001464   0.001660   0.882   0.3797
## MRRF         0.085247   0.043736   1.949   0.0537 .
## SMB         0.454022   0.098953   4.588 1.16e-05 ***
## HML        -0.229889   0.129679  -1.773   0.0789 .
## RMW        -0.002996   0.165900  -0.018   0.9856
## CMA         0.071182   0.178961   0.398   0.6916
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01707 on 114 degrees of freedom
## Multiple R-squared:  0.2306, Adjusted R-squared:  0.1968
## F-statistic: 6.832 on 5 and 114 DF,  p-value: 1.309e-05
```

```
FTR_HM_HTR_HM_EW_diff <- lm(formula="FTR_HM_EW-HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(FTR_HM_HTR_HM_EW_diff))
```

```
##
## Call:
## lm(formula = "FTR_HM_EW-HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.066160 -0.013581  0.000243  0.013523  0.055650
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.0004901  0.0020338   0.241   0.8100
## MRRF         0.0479249  0.0535839   0.894   0.3730
## SMB         0.1142676  0.1212357   0.943   0.3479
## HML         0.3209129  0.1588799   2.020   0.0457 *
## RMW        -0.0362003  0.2032577  -0.178   0.8590
```

```

## CMA          -0.2657423  0.2192600  -1.212   0.2280
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02091 on 114 degrees of freedom
## Multiple R-squared:  0.1626, Adjusted R-squared:  0.1259
## F-statistic: 4.429 on 5 and 114 DF,  p-value: 0.001008

LTR_MM_HTR_HM_EW_diff <- lm(formula="LTR_MM_EW-HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(LTR_MM_HTR_HM_EW_diff))

##
## Call:
## lm(formula = "LTR_MM_EW-HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.030578 -0.008805 -0.001155  0.009690  0.060250
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.004515   0.001539  -2.934 0.004049 **
## MRRF         0.066511   0.040548   1.640 0.103700
## SMB         0.300968   0.091742   3.281 0.001375 **
## HML         0.361004   0.120228   3.003 0.003290 **
## RMW         0.568944   0.153809   3.699 0.000335 ***
## CMA         0.116011   0.165919   0.699 0.485849
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01582 on 114 degrees of freedom
## Multiple R-squared:  0.2672, Adjusted R-squared:  0.2351
## F-statistic: 8.314 on 5 and 114 DF,  p-value: 9.968e-07

# VW
HTR_LM_HTR_HM_VW_diff <- lm(formula="HTR_LM_VW-HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(HTR_LM_HTR_HM_VW_diff))

##
## Call:
## lm(formula = "HTR_LM_VW-HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.068300 -0.017080  0.001253  0.017374  0.060577
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.0005638  0.0024206  -0.233  0.8162
## MRRF         0.0567907  0.0637760   0.890  0.3751
## SMB         0.0069520  0.1442958   0.048  0.9617

```

```
## HML          0.1477236  0.1891002  0.781  0.4363
## RMW          0.5118718  0.2419191  2.116  0.0365 *
## CMA         -0.1317103  0.2609652 -0.505  0.6147
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02489 on 114 degrees of freedom
## Multiple R-squared:  0.06554, Adjusted R-squared:  0.02456
## F-statistic: 1.599 on 5 and 114 DF, p-value: 0.1659
```

```
FTR_LM_HTR_HM_VW_diff <- lm(formula="FTR_LM_VW-HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(FTR_LM_HTR_HM_VW_diff))
```

```
##
## Call:
## lm(formula = "FTR_LM_VW-HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.044247 -0.010196 -0.001737  0.011941  0.050158
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.000182   0.001797   0.101  0.91952
## MRRF        -0.124223   0.047343  -2.624  0.00988 **
## SMB         0.584381   0.107115   5.456 2.88e-07 ***
## HML        -0.190467   0.140375  -1.357  0.17751
## RMW        -0.284648   0.179584  -1.585  0.11573
## CMA        -0.120639   0.193722  -0.623  0.53470
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01848 on 114 degrees of freedom
## Multiple R-squared:  0.3194, Adjusted R-squared:  0.2896
## F-statistic: 10.7 on 5 and 114 DF, p-value: 1.901e-08
```

```
FTR_HM_HTR_HM_VW_diff <- lm(formula="FTR_HM_VW-HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(FTR_HM_HTR_HM_VW_diff))
```

```
##
## Call:
## lm(formula = "FTR_HM_VW-HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.069553 -0.015113 -0.001535  0.016011  0.086946
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -8.283e-05  2.455e-03  -0.034  0.973
## MRRF        1.022e-01  6.469e-02   1.579  0.117
```

```
## SMB          9.443e-02  1.464e-01  0.645  0.520
## HML          2.111e-01  1.918e-01  1.100  0.273
## RMW          1.546e-01  2.454e-01  0.630  0.530
## CMA          -3.137e-01  2.647e-01  -1.185  0.238
##
## Residual standard error: 0.02524 on 114 degrees of freedom
## Multiple R-squared:  0.08497,    Adjusted R-squared:  0.04484
## F-statistic: 2.117 on 5 and 114 DF,  p-value: 0.06833

LTR_MM_HTR_HM_VW_diff <- lm(formula="LTR_MM_VW-HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA",data=FAMA)
print(summary(LTR_MM_HTR_HM_VW_diff))
```

```
##
## Call:
## lm(formula = "LTR_MM_VW-HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.050926 -0.013467  0.001635  0.012481  0.063992
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.003840   0.002049  -1.874 0.063497 .
## MRRF         -0.045736   0.053986  -0.847 0.398665
## SMB           0.019528   0.122144   0.160 0.873260
## HML           0.359134   0.160071   2.244 0.026790 *
## RMW           0.726853   0.204781   3.549 0.000562 ***
## CMA          -0.070053   0.220903  -0.317 0.751732
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02107 on 114 degrees of freedom
## Multiple R-squared:  0.1014, Adjusted R-squared:  0.06204
## F-statistic: 2.574 on 5 and 114 DF,  p-value: 0.03026
```

```
## Difference with MOM ##
# EW
HTR_LM_HTR_HM_EW_MOM_diff <- lm(formula="HTR_LM_EW-HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=
print(summary(HTR_LM_HTR_HM_EW_MOM_diff))
```

```
##
## Call:
## lm(formula = "HTR_LM_EW-HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.044828 -0.010206 -0.000926  0.010528  0.062761
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.0008919  0.0020162  -0.442  0.6591
```

```

## MRRF      0.0406926  0.0515604  0.789  0.4316
## SMB       0.3006955  0.1155271  2.603  0.0105 *
## HML      -0.0102384  0.1676541 -0.061  0.9514
## RMW       0.4690865  0.1922377  2.440  0.0162 *
## CMA       0.1996838  0.2169772  0.920  0.3594
## MOM       0.0198029  0.0777035  0.255  0.7993
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01978 on 113 degrees of freedom
## Multiple R-squared:  0.1315, Adjusted R-squared:  0.08534
## F-statistic: 2.851 on 6 and 113 DF,  p-value: 0.0127

```

```

FTR_LM_HTR_HM_EW_MOM_diff <- lm(formula="FTR_LM_EW-HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=
print(summary(FTR_LM_HTR_HM_EW_MOM_diff))

```

```

##
## Call:
## lm(formula = "FTR_LM_EW-HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.041009 -0.010559 -0.000236  0.009771  0.057209
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.001739   0.001746   0.996   0.3213
## MRRF         0.080926   0.044639   1.813   0.0725 .
## SMB          0.460445   0.100019   4.604 1.09e-05 ***
## HML         -0.263718   0.145148  -1.817   0.0719 .
## RMW         -0.003452   0.166432  -0.021   0.9835
## CMA          0.100232   0.187850   0.534   0.5947
## MOM         -0.035352   0.067273  -0.526   0.6003
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01712 on 113 degrees of freedom
## Multiple R-squared:  0.2324, Adjusted R-squared:  0.1917
## F-statistic: 5.704 on 6 and 113 DF,  p-value: 3.287e-05

```

```

FTR_HM_HTR_HM_EW_MOM_diff <- lm(formula="FTR_HM_EW-HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=
print(summary(FTR_HM_HTR_HM_EW_MOM_diff))

```

```

##
## Call:
## lm(formula = "FTR_HM_EW-HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.065224 -0.012578  0.000563  0.013096  0.055978
##

```



```
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.0008918  0.0021375   0.417   0.677
## MRRF         0.0416131  0.0546626   0.761   0.448
## SMB          0.1236502  0.1224779   1.010   0.315
## HML          0.2715003  0.1777412   1.528   0.129
## RMW         -0.0368673  0.2038039  -0.181   0.857
## CMA         -0.2233102  0.2300319  -0.971   0.334
## MOM         -0.0516377  0.0823787  -0.627   0.532
##
## Residual standard error: 0.02097 on 113 degrees of freedom
## Multiple R-squared:  0.1655, Adjusted R-squared:  0.1212
## F-statistic: 3.736 on 6 and 113 DF,  p-value: 0.001989
```

```
LTR_MM_HTR_HM_EW_MOM_diff <- lm(formula="LTR_MM_EW-HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=
print(summary(LTR_MM_HTR_HM_EW_MOM_diff))
```

```
##
## Call:
## lm(formula = "LTR_MM_EW-HTR_HM_EW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.031441 -0.009121 -0.001568  0.009432  0.054655
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.003723   0.001601  -2.325 0.021840 *
## MRRF         0.054062   0.040946   1.320 0.189387
## SMB          0.319473   0.091743   3.482 0.000708 ***
## HML          0.263551   0.133139   1.980 0.050189 .
## RMW         0.567629   0.152661   3.718 0.000314 ***
## CMA          0.199697   0.172308   1.159 0.248919
## MOM         -0.101841   0.061707  -1.650 0.101637
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01571 on 113 degrees of freedom
## Multiple R-squared:  0.2845, Adjusted R-squared:  0.2465
## F-statistic: 7.487 on 6 and 113 DF,  p-value: 9.087e-07
```

```
# VW
HTR_LM_HTR_HM_VW_MOM_diff <- lm(formula="HTR_LM_VW-HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=
print(summary(HTR_LM_HTR_HM_VW_MOM_diff))
```

```
##
## Call:
## lm(formula = "HTR_LM_VW-HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
```

```
## -0.068310 -0.017051 0.001248 0.017421 0.060614
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.0005512 0.0025485 -0.216 0.8291
## MRRF        0.0565928 0.0651729 0.868 0.3870
## SMB         0.0072463 0.1460273 0.050 0.9605
## HML         0.1461739 0.2119164 0.690 0.4918
## RMW         0.5118509 0.2429902 2.106 0.0374 *
## CMA        -0.1303795 0.2742612 -0.475 0.6354
## MOM        -0.0016195 0.0982180 -0.016 0.9869
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.025 on 113 degrees of freedom
## Multiple R-squared: 0.06554, Adjusted R-squared: 0.01593
## F-statistic: 1.321 on 6 and 113 DF, p-value: 0.2535
```

```
FTR_LM_HTR_HM_VW_MOM_diff <- lm(formula="FTR_LM_VW-HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=
print(summary(FTR_LM_HTR_HM_VW_MOM_diff))
```

```
##
## Call:
## lm(formula = "FTR_LM_VW-HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.043890 -0.009424 -0.002175 0.011527 0.051102
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.0002901 0.0018860 -0.154 0.878
## MRRF        -0.1168035 0.0482312 -2.422 0.017 *
## SMB         0.5733520 0.1080675 5.305 5.66e-07 ***
## HML        -0.1323864 0.1568287 -0.844 0.400
## RMW        -0.2838639 0.1798249 -1.579 0.117
## CMA        -0.1705153 0.2029669 -0.840 0.403
## MOM         0.0606964 0.0726862 0.835 0.405
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.0185 on 113 degrees of freedom
## Multiple R-squared: 0.3236, Adjusted R-squared: 0.2877
## F-statistic: 9.009 on 6 and 113 DF, p-value: 4.835e-08
```

```
FTR_HM_HTR_HM_VW_MOM_diff <- lm(formula="FTR_HM_VW-HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=
print(summary(FTR_HM_HTR_HM_VW_MOM_diff))
```

```
##
## Call:
## lm(formula = "FTR_HM_VW-HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
```

```
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.069621 -0.015030 -0.001455  0.015982  0.086486
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -3.053e-05  2.585e-03  -0.012  0.991
## MRRF         1.013e-01  6.610e-02   1.533  0.128
## SMB          9.565e-02  1.481e-01   0.646  0.520
## HML          2.046e-01  2.149e-01   0.952  0.343
## RMW          1.545e-01  2.465e-01   0.627  0.532
## CMA         -3.081e-01  2.782e-01  -1.108  0.270
## MOM         -6.723e-03  9.962e-02  -0.067  0.946
##
## Residual standard error: 0.02536 on 113 degrees of freedom
## Multiple R-squared:  0.08501, Adjusted R-squared:  0.03642
## F-statistic:  1.75 on 6 and 113 DF, p-value: 0.1159

LTR_MM_HTR_HM_VW_MOM_diff <- lm(formula="LTR_MM_VW-HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",data=)
print(summary(LTR_MM_HTR_HM_VW_MOM_diff))
```

```
##
## Call:
## lm(formula = "LTR_MM_VW-HTR_HM_VW ~ MRRF + SMB + HML+ RMW + CMA + MOM",
##     data = FAMA)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.051205 -0.012329  0.000664  0.011628  0.063666
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.004326  0.002152  -2.010 0.046764 *
## MRRF         -0.038091  0.055030  -0.692 0.490236
## SMB          0.008164  0.123300   0.066 0.947326
## HML          0.418982  0.178935   2.342 0.020957 *
## RMW          0.727661  0.205172   3.547 0.000569 ***
## CMA         -0.121446  0.231576  -0.524 0.601005
## MOM          0.062543  0.082932   0.754 0.452328
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.02111 on 113 degrees of freedom
## Multiple R-squared:  0.1059, Adjusted R-squared:  0.05847
## F-statistic:  2.232 on 6 and 113 DF, p-value: 0.04506
```