SEcondPart_a.R

endur

2024-01-04

```
library(tidyverse)
```

```
## Warning: il pacchetto 'forcats' è stato creato con R versione 4.3.1
```

```
## ── Attaching core tidyverse packages ──────────────────────── tidyverse 2.0.0 ──
## ✓ dplyr     1.1.2     ✓ readr     2.1.4
## ✓ forcats   1.0.0     ✓ stringr   1.5.0
## ✓ ggplot2   3.4.2     ✓ tibble    3.2.1
## ✓ lubridate 1.9.2     ✓ tidyr     1.3.0
## ✓ purrr     1.0.1
## ── Conflicts ────────────────────────────────────────── tidyverse_conflicts() ──
## ✖ dplyr::filter() masks stats::filter()
## ✖ dplyr::lag()    masks stats::lag()
## ℹ Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

```
library(tidytext)
library(readxl)
library(e1071)
library(ggplot2)
library(openxlsx)
```

```
## Warning: il pacchetto 'openxlsx' è stato creato con R versione 4.3.2
```

```
library(lubridate)
library(plm)
```

```
## Warning: il pacchetto 'plm' è stato creato con R versione 4.3.2
```

```
##
## Caricamento pacchetto: 'plm'
##
## I seguenti oggetti sono mascherati da 'package:dplyr':
##
##     between, lag, lead
```

```
library(robustbase)
```

```
## Warning: il pacchetto 'robustbase' è stato creato con R versione 4.3.2
```

```
library(DescTools)
```

```
## Warning: il pacchetto 'DescTools' è stato creato con R versione 4.3.2
```

```
library(dplyr)



setwd("C:\\Users\\endur\\Desktop\\laurea magistrale\\Financial\\First_Assignment\\Nuova cartella")

DB <- read_excel("DB2_a.xlsx")

DB <- DB %>% group_by(Name) %>%
  mutate(LEVERAGE_NATLOG_LAG = dplyr::lag(LEVERAGE_NATLOG))

DB <- DB %>% group_by(Name) %>%
  mutate(MRKT_VALUE_BOOK_RATIO_LAG = dplyr::lag(`MRKT_VALUE_TO_BOOK`))

lower_threshold <- 0.1
upper_threshold <- 0.90

columns_to_wins = c("PRICE_OR_TRADE","TOTAL_ASSETS","TOT_NATLOG","TOT_GRWTRATE","MRKT_VALUE_TO_BOOK","MARKET_VA
LUE",
                    "MRKT_VALUE_NATLOG","MKT_VALUE_GRWTRATE","TOT_ASSETS_CMN_EQUITY_RATIO","LEVERAGE_NATLOG","L
EVERAGE_GRWTRATE",
                    "LEVERAGE_NATLOG_LAG","MRKT_VALUE_BOOK_RATIO_LAG")

DB[columns_to_wins] <- lapply(DB[columns_to_wins], function(x) Winsorize(x, probs = c(lower_threshold, upper_th
reshold), na.rm = TRUE))




MOD1 <- plm(LEVERAGE_GRWTRATE ~ TOT_GRWTRATE + LEVERAGE_NATLOG_LAG + factor(Year)-1,
            data = DB, model = "within")
```

```
## Warning in pdata.frame(data, index): duplicate couples (id-time) in resulting pdata.frame
##  to find out which, use, e.g., table(index(your_pdataframe), useNA = "ifany")
```

```
summary(MOD1)
```

```
## Oneway (individual) effect Within Model
##
## Call:
## plm(formula = LEVERAGE_GRWTRATE ~ TOT_GRWTRATE + LEVERAGE_NATLOG_LAG +
##     factor(Year) - 1, data = DB, model = "within")
##
## Unbalanced Panel: n = 219, T = 65-210, N = 21823
##
## Residuals:
##        Min.     1st Qu.      Median     3rd Qu.        Max.
## -0.11932978 -0.01782258 -0.00061322  0.01726607  0.10566058
##
## Coefficients: (1 dropped because of singularities)
##                         Estimate  Std. Error  t-value  Pr(>|t|)
## TOT_GRWTRATE          0.53722160  0.00706132  76.0795 < 2.2e-16 ***
## LEVERAGE_NATLOG_LAG -0.00484232  0.00037253 -12.9984 < 2.2e-16 ***
## factor(Year)2005      0.04131639  0.03220243   1.2830 0.1994986
## factor(Year)2006     -0.00066634  0.00158110  -0.4214 0.6734361
## factor(Year)2007      0.00561598  0.00157814   3.5586 0.0003736 ***
## factor(Year)2008      0.01402028  0.00157778   8.8861 < 2.2e-16 ***
## factor(Year)2009      0.00463256  0.00157839   2.9350 0.0033391 **
## factor(Year)2010      0.00403380  0.00157945   2.5539 0.0106587 *
## factor(Year)2011      0.00167469  0.00157978   1.0601 0.2891199
## factor(Year)2012      0.00282301  0.00158086   1.7857 0.0741557 .
## factor(Year)2013      0.00480611  0.00158196   3.0381 0.0023838 **
## factor(Year)2014     -0.00149867  0.00158218  -0.9472 0.3435392
## factor(Year)2015      0.00388446  0.00158171   2.4559 0.0140625 *
## factor(Year)2016      0.00351875  0.00158461   2.2206 0.0263904 *
## factor(Year)2017     -0.00061309  0.00158422  -0.3870 0.6987638
## factor(Year)2018      0.00081065  0.00158334   0.5120 0.6086652
## factor(Year)2019     -0.00234051  0.00158459  -1.4771 0.1396768
## factor(Year)2020      0.00830108  0.00158768   5.2284 1.725e-07 ***
## factor(Year)2021      0.00697500  0.00158125   4.4111 1.034e-05 ***
## factor(Year)2022      0.02287466  0.00158281  14.4520 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Total Sum of Squares:    29.069
## Residual Sum of Squares: 22.184
## R-Squared:      0.23684
## Adj. R-Squared: 0.22842
## F-statistic: 334.913 on 20 and 21584 DF, p-value: < 2.22e-16
```

```
MOD2 =plm(LEVERAGE_GRWTRATE ~ TOT_GRWTRATE + MRKT_VALUE_BOOK_RATIO_LAG + LEVERAGE_NATLOG_LAG+  + factor(Year)-
1,
          data = DB, model = "within")
```

```
## Warning in pdata.frame(data, index): duplicate couples (id-time) in resulting pdata.frame
##  to find out which, use, e.g., table(index(your_pdataframe), useNA = "ifany")
```

```
summary(MOD2)
```

```
## Oneway (individual) effect Within Model
##
## Call:
## plm(formula = LEVERAGE_GRWTRATE ~ TOT_GRWTRATE + MRKT_VALUE_BOOK_RATIO_LAG +
##     LEVERAGE_NATLOG_LAG + +factor(Year) - 1, data = DB, model = "within")
##
## Unbalanced Panel: n = 219, T = 65-210, N = 21823
##
## Residuals:
##        Min.     1st Qu.      Median     3rd Qu.        Max.
## -0.12073034 -0.01785490 -0.00066935  0.01723381  0.10634561
##
## Coefficients: (1 dropped because of singularities)
##                              Estimate  Std. Error  t-value  Pr(>|t|)
## TOT_GRWTRATE               0.53665350  0.00706296  75.9814 < 2.2e-16 ***
## MRKT_VALUE_BOOK_RATIO_LAG  0.00123393  0.00043230   2.8543  0.004317 **
## LEVERAGE_NATLOG_LAG       -0.00454117  0.00038712 -11.7305 < 2.2e-16 ***
## factor(Year)2005           0.04149844  0.03219716   1.2889  0.197452
## factor(Year)2006          -0.00139505  0.00160132  -0.8712  0.383663
## factor(Year)2007           0.00499352  0.00159288   3.1349  0.001721 **
## factor(Year)2008           0.01379935  0.00157942   8.7370 < 2.2e-16 ***
## factor(Year)2009           0.00478978  0.00157909   3.0332  0.002422 **
## factor(Year)2010           0.00415557  0.00157977   2.6305  0.008532 **
## factor(Year)2011           0.00177587  0.00157992   1.1240  0.261013
## factor(Year)2012           0.00295357  0.00158126   1.8679  0.061796 .
## factor(Year)2013           0.00479774  0.00158170   3.0333  0.002422 **
## factor(Year)2014          -0.00161110  0.00158241  -1.0181  0.308629
## factor(Year)2015           0.00379797  0.00158174   2.4011  0.016353 *
## factor(Year)2016           0.00353831  0.00158437   2.2333  0.025542 *
## factor(Year)2017          -0.00089077  0.00158694  -0.5613  0.574589
## factor(Year)2018           0.00052171  0.00158631   0.3289  0.742249
## factor(Year)2019          -0.00233202  0.00158433  -1.4719  0.141055
## factor(Year)2020           0.00858979  0.00159063   5.4002 6.726e-08 ***
## factor(Year)2021           0.00698220  0.00158100   4.4163 1.009e-05 ***
## factor(Year)2022           0.02278524  0.00158285  14.3950 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Total Sum of Squares:    29.069
## Residual Sum of Squares: 22.176
## R-Squared:      0.23712
## Adj. R-Squared: 0.22868
## F-statistic: 319.458 on 21 and 21583 DF, p-value: < 2.22e-16
```

```
MOD3 = plm(LEVERAGE_GRWTRATE ~ MKT_VALUE_GRWTRATE + LEVERAGE_NATLOG_LAG +  + factor(Year)-1,
           data = DB, model = "within")
```

```
## Warning in pdata.frame(data, index): duplicate couples (id-time) in resulting pdata.frame
##  to find out which, use, e.g., table(index(your_pdataframe), useNA = "ifany")
```

```
summary(MOD3)
```

```
## Oneway (individual) effect Within Model
##
## Call:
## plm(formula = LEVERAGE_GRWTRATE ~ MKT_VALUE_GRWTRATE + LEVERAGE_NATLOG_LAG +
##     +factor(Year) - 1, data = DB, model = "within")
##
## Unbalanced Panel: n = 219, T = 65-210, N = 21823
##
## Residuals:
##       Min.    1st Qu.     Median    3rd Qu.       Max.
## -0.0941568 -0.0238270 -0.0021458  0.0221344  0.0907288
##
## Coefficients: (1 dropped because of singularities)
##                         Estimate  Std. Error  t-value  Pr(>|t|)
## MKT_VALUE_GRWTRATE  -0.01996733  0.00201170  -9.9256 < 2.2e-16 ***
## LEVERAGE_NATLOG_LAG -0.00461112  0.00041853 -11.0173 < 2.2e-16 ***
## factor(Year)2005     0.08115272  0.03618224   2.2429 0.0249141 *
## factor(Year)2006     0.00518361  0.00178452   2.9048 0.0036789 **
## factor(Year)2007     0.00897858  0.00177276   5.0647 4.123e-07 ***
## factor(Year)2008     0.01538260  0.00177283   8.6769 < 2.2e-16 ***
## factor(Year)2009     0.00520025  0.00177977   2.9219 0.0034830 **
## factor(Year)2010     0.00315286  0.00178361   1.7677 0.0771277 .
## factor(Year)2011     0.00162354  0.00177790   0.9132 0.3611609
## factor(Year)2012     0.00397212  0.00178727   2.2225 0.0262628 *
## factor(Year)2013     0.00615256  0.00179491   3.4278 0.0006097 ***
## factor(Year)2014     0.00212913  0.00178353   1.1938 0.2325796
## factor(Year)2015     0.00687293  0.00178216   3.8565 0.0001154 ***
## factor(Year)2016     0.00785755  0.00179547   4.3763 1.213e-05 ***
## factor(Year)2017     0.00336753  0.00178760   1.8838 0.0596013 .
## factor(Year)2018     0.00295470  0.00178028   1.6597 0.0969935 .
## factor(Year)2019     0.00140807  0.00179148   0.7860 0.4318875
## factor(Year)2020     0.01708388  0.00178598   9.5655 < 2.2e-16 ***
## factor(Year)2021     0.01466485  0.00178928   8.1959 2.624e-16 ***
## factor(Year)2022     0.02080245  0.00177955  11.6898 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Total Sum of Squares:    29.068
## Residual Sum of Squares: 28.004
## R-Squared:      0.03659
## Adj. R-Squared: 0.025967
## F-statistic: 40.9881 on 20 and 21584 DF, p-value: < 2.22e-16
```

```
MOD4 = plm(LEVERAGE_GRWTRATE ~ MKT_VALUE_GRWTRATE + MRKT_VALUE_BOOK_RATIO_LAG +LEVERAGE_NATLOG_LAG  + factor(Ye
ar)-1,
           data = DB, model = "within")
```

```
## Warning in pdata.frame(data, index): duplicate couples (id-time) in resulting pdata.frame
##  to find out which, use, e.g., table(index(your_pdataframe), useNA = "ifany")
```

```
summary(MOD4)
```

```
## Oneway (individual) effect Within Model
##
## Call:
## plm(formula = LEVERAGE_GRWTRATE ~ MKT_VALUE_GRWTRATE + MRKT_VALUE_BOOK_RATIO_LAG +
##     LEVERAGE_NATLOG_LAG + factor(Year) - 1, data = DB, model = "within")
##
## Unbalanced Panel: n = 219, T = 65-210, N = 21823
##
## Residuals:
##       Min.    1st Qu.     Median    3rd Qu.       Max.
## -0.0956475 -0.0237691 -0.0020921  0.0220970  0.0906591
##
## Coefficients: (1 dropped because of singularities)
##                              Estimate  Std. Error t-value  Pr(>|t|)
## MKT_VALUE_GRWTRATE        -0.01909014  0.00203180 -9.3957 < 2.2e-16 ***
## MRKT_VALUE_BOOK_RATIO_LAG  0.00149533  0.00049056  3.0482 0.0023051 **
## LEVERAGE_NATLOG_LAG       -0.00424754  0.00043512 -9.7617 < 2.2e-16 ***
## factor(Year)2005           0.08106854  0.03617530  2.2410 0.0250368 *
## factor(Year)2006           0.00421534  0.00181223  2.3260 0.0200253 *
## factor(Year)2007           0.00820775  0.00179037  4.5844 4.579e-06 ***
## factor(Year)2008           0.01510195  0.00177488  8.5087 < 2.2e-16 ***
## factor(Year)2009           0.00532615  0.00177990  2.9924 0.0027712 **
## factor(Year)2010           0.00322393  0.00178342  1.8077 0.0706639 .
## factor(Year)2011           0.00170243  0.00177775  0.9576 0.3382595
## factor(Year)2012           0.00404482  0.00178708  2.2634 0.0236229 *
## factor(Year)2013           0.00603517  0.00179497  3.3623 0.0007744 ***
## factor(Year)2014           0.00192562  0.00178444  1.0791 0.2805477
## factor(Year)2015           0.00670663  0.00178266  3.7622 0.0001689 ***
## factor(Year)2016           0.00777666  0.00179533  4.3316 1.487e-05 ***
## factor(Year)2017           0.00295454  0.00179238  1.6484 0.0992881 .
## factor(Year)2018           0.00257133  0.00178438  1.4410 0.1495938
## factor(Year)2019           0.00132856  0.00179133  0.7417 0.4582993
## factor(Year)2020           0.01736328  0.00178799  9.7111 < 2.2e-16 ***
## factor(Year)2021           0.01456752  0.00178922  8.1418 4.103e-16 ***
## factor(Year)2022           0.02066388  0.00177978 11.6103 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Total Sum of Squares:    29.068
## Residual Sum of Squares: 27.992
## R-Squared:      0.037005
## Adj. R-Squared: 0.026341
## F-statistic: 39.4937 on 21 and 21583 DF, p-value: < 2.22e-16
```