
title: "Dynamic Model"
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output:
pdf_document: default
html_document: default

Exploración de los paneles

Importemos los paneles donde un panel corresponde a los bateadores y, el otro, a los fielderos.

```
setwd("~/Documentos/Github/Proyectos/MLB_HN/")  
hitters_panel <- read.csv('ETL_Data/Panel/General/Dynamic_model/dynamic_model_hitter_pca.csv')  
fielders_panel <- read.csv('ETL_Data/Panel/General/Dynamic_model/dynamic_model_fielder_pca.csv')
```

Por otro lado, se mostrarán las dimensiones de cada panel

```
print("Bateadores: ")
```

```
## [1] "Bateadores: "
```

```
print(dim(hitters_panel))
```

```
## [1] 570 207
```

```
print("")
```

```
## [1] ""
```

```
print("Fildeadores: ")
```

```
## [1] "Fildeadores: "
```

```
print(dim(fielders_panel))
```

```
## [1] 542 226
```

Debido a que en las estadísticas descriptivas se observó un shock en el año de la pandemia COVID-19, se obtendrán las estimaciones quitando el año 2020.

Segmentación por grupo

Lo que haremos es dividir los paneles en ciertas categorías. Primero, veamos todas las posiciones en los paneles

```
print("Bateadores:")
```

```
## [1] "Bateadores:"
```

```
print(unique(hitters_panel$Posicion_t))
```

```
## [1] SP C CF RF DH 1B 2B SS 3B LF RP OF  
## Levels: 1B 2B 3B C CF DH LF OF RF RP SP SS
```

```
print("")
```

```
## [1] ""
```

```
print("Fildeadores:")
```

```
## [1] "Fildeadores:"
```

```
print(unique(fielders_panel$Posicion_t))
```

```
## [1] SP RP RP/CL RF SS  
## Levels: RF RP RP/CL SP SS
```

Arriba se muestran las posiciones de los jugadores en nuestras bases de datos. A pesar de que en los bateadores aparezcan posiciones defensivas se debe a que estos juegan tanto como ofensivos como defensivos. Estando en la ofensiva se juega en la misma posición que todos por lo que no es necesario especificar que ocupala posición de bateador (**H**). Sin embargo, cuando se dice que es un bateador designado (**DH**) ya que este solo juega en la ofensiva para sustituir a un lanzador/pitcher.

Por otro lado, veamos cuantas observaciones hay por posición.

```
hitters_panel %>% count(Posicion_t, sort = TRUE)
```

```
##   Posicion_t    n  
## 1         SP 112  
## 2          C   76  
## 3         LF   60  
## 4         RF   59  
## 5         2B   53  
## 6         RP   47  
## 7         1B   45  
## 8         3B   31  
## 9         DH   31  
## 10        CF   28  
## 11        SS   27  
## 12        OF    1
```

```
fielders_panel %>% count(Posicion_t, sort = TRUE)
```

```
## Posicion_t n
## 1 RP 299
## 2 SP 206
## 3 RP/CL 22
## 4 SS 12
## 5 RF 3
```

Continuemos con la segmentación de acuerdo a categorías. Primero, obtendremos el split de todas las posiciones y luego concatenaremos de acuerdo a los grupos de interés:

Ofensivos:

- **Bateador designado (DH).**
- **No bateador designado (H).**

Debido a la falta de observaciones para los *outfielders* es que se omitirá su estimación. Por otro lado, debido a que la mayoría de los datos para los fildeadores son de los lanzadores, podemos agruparlos de la siguiente manera

Defensivos:

- **Starting pitcher:** Lanzador inicial (SP).
- **Relief pitcher:** Lanzador de relevo (RP) y lanzador de cierre (RP/CL)
- **Campo corto (SS).**

Segundo, crearemos las categorías de acuerdo a la especificación mencionada arriba

Tercero, concatenaremos estas bases de datos de acuerdo a los grupos señalados anteriormente

Veamos las dimensiones de cada una de los paneles sin el shock de la COVID-19:

```
print("Regular hitter: ")
```

```
## [1] "Regular hitter: "
```

```
print(dim(hitter_cov_data))
```

```
## [1] 501 207
```

```
print("")
```

```
## [1] ""
```

```
print("Designated hitter: ")
```

```
## [1] "Designated hitter: "
```

```
print(dim(d_hitter_cov_data))
```

```
## [1] 30 207
```

```

print("")

## [1] ""

print("Relief pitchers: ")

## [1] "Relief pitchers: "

print(dim(relief_pitcher_cov_data))

## [1] 296 226

print("")

## [1] ""

print("Starting pitchers: ")

## [1] "Starting pitchers: "

print(dim(starting_cov_data))

## [1] 185 226

print("")

## [1] ""

print("Short stops: ")

## [1] "Short stops: "

print(dim(shorts_cov_data))

## [1] 12 226

```

Estimaciones y regresiones

Lo que resta hacer es implementar un algoritmo donde se pueda hacer el siguiente modelo para todas las estadísticas deportiva de acuerdo a si el jugador es defensivo u ofensivo:

$$Y_t(\cdot) = \alpha + \beta_0 X_t + \beta_1 \text{Controles}_t + u_t$$

donde

- $Controles_t$:
 - Equipo.
 - Edad.
 - Año.
- α : Heterogeneidad del jugador.

Creemos la lista de variables sobre las cuáles se va a iterar el clico

Variables para los fildeadores

Las variables base para ambos tipos de jugadores son los controles

```
# Constroles:
vars <- 'Y_Sueldo_regular_norm_t ~ Edad_t + Anios_de_contrato_t'
```

Estimaciones directas

Pooling

Bateadores

Se obtendrán las estimaciones de las variables referentes a estadísticas deportivas sin controles

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_hitter_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_h <- paste(vars, stat_hitter_t[[i]],
    sep = '+')
  formula <- paste(base_vars_h,
    stat_hitter_t_1[[i]],
    sep = " + ")

  h_m_pooled <- plm(formula, data = hitter_data,
    model = "pooling",
    index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(h_m_pooled,
    vcov = vcovHC(h_m_pooled,
      type = "HC1",
      cluster = "group"))

  print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.17506249  0.08159997  2.1454  0.03237 *
## Edad_t         -0.00607442  0.00263103 -2.3088  0.02134 *
## Anios_de_contrato_t 0.00077098  0.00395381  0.1950  0.84547
```

```

## X_At_bats_t          -0.00052021  0.00053726 -0.9683  0.33335
## X_At_bats_t_1        -0.00054049  0.00060519 -0.8931  0.37221
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.7035e-01  7.8066e-02  2.1822  0.02953 *
## Edad_t         -5.9158e-03  2.5030e-03 -2.3635  0.01846 *
## Anios_de_contrato_t -5.9087e-04  3.8955e-03 -0.1517  0.87950
## X_At_bats_2_t    -1.7545e-05  3.6711e-05 -0.4779  0.63289
## X_At_bats_2_t_1  -1.8594e-07  2.5508e-05 -0.0073  0.99419
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.16262850  0.07741223  2.1008  0.03613 *
## Edad_t         -0.00570391  0.00248738 -2.2931  0.02223 *
## Anios_de_contrato_t 0.00052200  0.00381441  0.1369  0.89120
## X_Bateos_t     -0.00187878  0.00112728 -1.6666  0.09617 .
## X_Bateos_t_1    0.00027483  0.00095519  0.2877  0.77367
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.6547e-01  8.2673e-02  2.0015  0.04584 *
## Edad_t         -5.7390e-03  2.6108e-03 -2.1982  0.02836 *
## Anios_de_contrato_t -8.1601e-04  3.9925e-03 -0.2044  0.83813
## X_Bateos_2_t    -1.0566e-04  1.0926e-04 -0.9670  0.33398
## X_Bateos_2_t_1    7.3416e-05  1.0238e-04  0.7171  0.47363
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.1666991  0.0805298  2.0700  0.03893 *
## Edad_t         -0.0058036  0.0025715 -2.2568  0.02442 *
## Anios_de_contrato_t -0.0004196  0.0034322 -0.1223  0.90274
## X_Bateos_promedio_t -0.0295967  0.0194351 -1.5229  0.12839
## X_Bateos_promedio_t_1 0.0182852  0.0171475  1.0663  0.28675
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##

```

```

## t test of coefficients:
##
##
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.16175193  0.08092788  1.9987  0.04615 *
## Edad_t           -0.00563590  0.00258788 -2.1778  0.02986 *
## Anios_de_contrato_t -0.00058467  0.00341609 -0.1712  0.86417
## X_Bateos_promedio_2_t -0.04689009  0.02966361 -1.5807  0.11453
## X_Bateos_promedio_2_t_1 0.00401993  0.01656292  0.2427  0.80833
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1625249  0.0763610  2.1284  0.03376 *
## Edad_t           -0.0057736  0.0024722 -2.3354  0.01989 *
## Anios_de_contrato_t 0.0014016  0.0042347  0.3310  0.74080
## X_Dobles_t        -0.0042300  0.0029807 -1.4191  0.15645
## X_Dobles_t_1       -0.0014913  0.0026672 -0.5591  0.57633
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.16751493  0.07995843  2.0950  0.03664 *
## Edad_t           -0.00578710  0.00253255 -2.2851  0.02270 *
## Anios_de_contrato_t -0.00074820  0.00386561 -0.1936  0.84660
## X_Dobles_2_t       -0.00037951  0.00051739 -0.7335  0.46357
## X_Dobles_2_t_1      0.00051767  0.00050140  1.0324  0.30233
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.17122163  0.07945177  2.1550  0.03161 *
## Edad_t           -0.00584548  0.00255767 -2.2855  0.02268 *
## Anios_de_contrato_t -0.00176630  0.00346518 -0.5097  0.61045
## X_Home_runs_t      -0.00069982  0.00373284 -0.1875  0.85136
## X_Home_runs_t_1     0.00334561  0.00228557  1.4638  0.14384
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.7304e-01  7.9907e-02  2.1655  0.03079 *
## Edad_t           -6.0232e-03  2.5470e-03 -2.3648  0.01840 *
## Anios_de_contrato_t -7.6909e-04  3.3860e-03 -0.2271  0.82041

```

```

## X_Home_runs_2_t      -5.6990e-04  9.0919e-04 -0.6268  0.53104
## X_Home_runs_2_t_1    -9.0476e-05  3.5709e-04 -0.2534  0.80008
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.17364033  0.08035038  2.1610  0.03114 *
## Edad_t           -0.00607501  0.00260391 -2.3330  0.02002 *
## Anios_de_contrato_t  0.00094682  0.00387064  0.2446  0.80685
## X_Juegos_iniciados_t -0.00150065  0.00098047 -1.5305  0.12647
## X_Juegos_iniciados_t_1 -0.00093686  0.00114608 -0.8174  0.41404
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.7070e-01  7.7922e-02  2.1907  0.02890 *
## Edad_t           -5.8814e-03  2.5018e-03 -2.3509  0.01909 *
## Anios_de_contrato_t -1.1947e-03  3.8620e-03 -0.3093  0.75719
## X_Juegos_iniciados_2_t -6.2725e-05  1.5383e-04 -0.4078  0.68361
## X_Juegos_iniciados_2_t_1 4.8943e-05  1.0409e-04  0.4702  0.63841
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.17447496  0.08082362  2.1587  0.03132
## Edad_t           -0.00584991  0.00257021 -2.2760  0.02324
## Anios_de_contrato_t -0.00048109  0.00344364 -0.1397  0.88895
## X_Porcentaje_On_base_plus_slugging_t -0.02049357  0.01394736 -1.4694  0.14233
## X_Porcentaje_On_base_plus_slugging_t_1 -0.00107382  0.01334344 -0.0805  0.93589
##
## (Intercept)      *
## Edad_t           *
## Anios_de_contrato_t
## X_Porcentaje_On_base_plus_slugging_t
## X_Porcentaje_On_base_plus_slugging_t_1
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value
## (Intercept)      1.5451e-01  8.2649e-02  1.8695
## Edad_t           -5.4260e-03  2.6420e-03 -2.0537
## Anios_de_contrato_t 2.5406e-05  3.6014e-03  0.0071

```



```

## X_Porcentaje_On_base_plus_slugging_2_t    -2.5876e-02  1.2715e-02 -2.0350
## X_Porcentaje_On_base_plus_slugging_2_t_1    8.0592e-03  1.1269e-02  0.7152
##                                             Pr(>|t|)
## (Intercept)                                0.06210 .
## Edad_t                                     0.04049 *
## Anios_de_contrato_t                       0.99437
## X_Porcentaje_On_base_plus_slugging_2_t      0.04235 *
## X_Porcentaje_On_base_plus_slugging_2_t_1    0.47483
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.17110136  0.07876120  2.1724  0.03026 *
## Edad_t           -0.00582636  0.00251837 -2.3135  0.02107 *
## Anios_de_contrato_t -0.00079028  0.00339408 -0.2328  0.81597
## X_Porcentaje_on_base_t -0.04139053  0.02142304 -1.9321  0.05388 .
## X_Porcentaje_on_base_t_1 0.02044418  0.01931141  1.0587  0.29024
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.15795871  0.07881236  2.0042  0.04555 *
## Edad_t           -0.00551201  0.00252045 -2.1869  0.02918 *
## Anios_de_contrato_t -0.00026721  0.00337337 -0.0792  0.93689
## X_Porcentaje_on_base_2_t -0.04864873  0.02830530 -1.7187  0.08625 .
## X_Porcentaje_on_base_2_t_1 0.00650491  0.01989979  0.3269  0.74388
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.18028464  0.07794454  2.3130  0.02110 *
## Edad_t           -0.00598177  0.00248973 -2.4026  0.01662 *
## Anios_de_contrato_t 0.00016595  0.00351414  0.0472  0.96235
## X_Porcentaje_slugging_t -0.01642854  0.01853165 -0.8865  0.37574
## X_Porcentaje_slugging_t_1 -0.02386609  0.01663173 -1.4350  0.15188
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.6244e-01  8.1895e-02  1.9835  0.04783 *
## Edad_t           -5.7174e-03  2.6194e-03 -2.1827  0.02949 *
## Anios_de_contrato_t 8.3828e-05  3.6014e-03  0.0233  0.98144

```

```

## X_Porcentaje_slugging_2_t   -3.8919e-02  2.1751e-02 -1.7893  0.07414 .
## X_Porcentaje_slugging_2_t_1  1.3622e-02  1.8396e-02  0.7405  0.45933
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.16338094  0.07859207  2.0788  0.03811 *
## Edad_t           -0.00570575  0.00255583 -2.2324  0.02600 *
## Anios_de_contrato_t  0.00023163  0.00396518  0.0584  0.95344
## X_Runs_batted_in_t -0.00283866  0.00147509 -1.9244  0.05484 .
## X_Runs_batted_in_t_1  0.00076588  0.00167162  0.4582  0.64702
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.7747e-01  8.0716e-02  2.1987  0.02833 *
## Edad_t           -6.0471e-03  2.5652e-03 -2.3574  0.01876 *
## Anios_de_contrato_t -1.7855e-03  3.6403e-03 -0.4905  0.62399
## X_Runs_batted_in_2_t  6.1630e-05  2.3305e-04  0.2645  0.79153
## X_Runs_batted_in_2_t_1  7.4061e-05  1.8457e-04  0.4013  0.68839
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1662153  0.0800800  2.0756  0.03841 *
## Edad_t           -0.0057431  0.0025589 -2.2444  0.02522 *
## Anios_de_contrato_t -0.0015196  0.0034254 -0.4436  0.65748
## X_Triples_t       -0.0107549  0.0078532 -1.3695  0.17142
## X_Triples_t_1      0.0118538  0.0049589  2.3904  0.01718 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1682025  0.0807652  2.0826  0.03776 *
## Edad_t           -0.0058227  0.0025761 -2.2603  0.02421 *
## Anios_de_contrato_t -0.0011920  0.0034005 -0.3505  0.72607
## X_Triples_2_t     -0.0024690  0.0039307 -0.6281  0.53019
## X_Triples_2_t_1    0.0011627  0.0008251  1.4092  0.15935
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##

```

```
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.2189162  0.0777537   2.8155 0.005050 **
## Edad_t         -0.0069237  0.0024811  -2.7905 0.005451 **
## Anios_de_contrato_t -0.0055170  0.0038817  -1.4213 0.155812
## X_WAR_t         0.0162617  0.0070144   2.3183 0.020808 *
## X_WAR_t_1       0.0133309  0.0057966   2.2998 0.021847 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.1917980  0.0755130   2.5399 0.01137 *
## Edad_t         -0.0063351  0.0024359  -2.6008 0.00956 **
## Anios_de_contrato_t -0.0022161  0.0034576  -0.6409 0.52185
## X_WAR_2_t       0.0056404  0.0037659   1.4978 0.13479
## X_WAR_2_t_1     0.0048634  0.0020585   2.3625 0.01851 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Starting pitcher

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_fielder_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_s <- paste(vars, stat_fielder_t[[i]],
                        sep = '+')
  formula <- paste(base_vars_s,
                   stat_fielder_t_1[[i]],
                   sep = " + ")

  s_m_pooled <- plm(formula, data = starting_data,
                    model = "pooling",
                    index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(s_m_pooled,
                           vcov = vcovHC(s_m_pooled,
                                           type = "HC1",
                                           cluster = "group"))

  print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.3544e-01  1.2030e-01  1.9572 0.05171 .
## Edad_t        -6.9175e-03  3.7159e-03  -1.8616 0.06412 .
```

```

## Anios_de_contrato_t -5.8938e-03  7.8082e-03 -0.7548  0.45124
## X_Bateos_2_t        -1.6702e-04  1.0825e-04 -1.5429  0.12442
## X_Bateos_2_t_1      -3.8189e-05  7.5718e-05 -0.5044  0.61456
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.26108490  0.12118897  2.1544  0.03240 *
## Edad_t         -0.00755204  0.00375731 -2.0100  0.04577 *
## Anios_de_contrato_t -0.00952293  0.00778937 -1.2226  0.22293
## X_Bateos_t      -0.00064186  0.00193488 -0.3317  0.74044
## X_Bateos_t_1     -0.00010861  0.00124775 -0.0870  0.93072
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.6858e-01  1.2420e-01  2.1625  0.03176 *
## Edad_t         -7.8024e-03  3.8290e-03 -2.0377  0.04289 *
## Anios_de_contrato_t -1.0478e-02  7.6013e-03 -1.3785  0.16959
## X_Carreras_2_t   -3.2619e-06  2.0271e-04 -0.0161  0.98718
## X_Carreras_2_t_1 -1.2199e-04  1.1428e-04 -1.0674  0.28706
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.27542070  0.13042455  2.1117  0.03595 *
## Edad_t         -0.00801860  0.00402464 -1.9924  0.04768 *
## Anios_de_contrato_t -0.01092414  0.00776853 -1.4062  0.16121
## X_Carreras_ganadas_2_t  0.00012850  0.00025140  0.5111  0.60983
## X_Carreras_ganadas_2_t_1 -0.00015285  0.00012930 -1.1822  0.23853
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.2539673  0.1248745  2.0338  0.04329 *
## Edad_t         -0.0072380  0.0038603 -1.8750  0.06224 .
## Anios_de_contrato_t -0.0087839  0.0078973 -1.1123  0.26735
## X_Carreras_ganadas_t -0.0017414  0.0021078 -0.8262  0.40967
## X_Carreras_ganadas_t_1 -0.0012250  0.0013982 -0.8761  0.38201
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##

```

```

##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2588500  0.1247027  2.0757  0.03919 *
## Edad_t           -0.0074038  0.0038576 -1.9193  0.05637 .
## Anios_de_contrato_t -0.0094011  0.0079860 -1.1772  0.24051
## X_Carreras_t      -0.0010833  0.0021719 -0.4988  0.61849
## X_Carreras_t_1     -0.0010669  0.0013582 -0.7855  0.43310
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.5467e-01  1.1740e-01  2.1693  0.03124 *
## Edad_t           -7.4676e-03  3.6554e-03 -2.0429  0.04237 *
## Anios_de_contrato_t -9.9363e-03  7.1577e-03 -1.3882  0.16661
## X_Comando_2_t      -4.4967e-04  6.3017e-03 -0.0714  0.94318
## X_Comando_2_t_1     -8.8985e-06  5.4821e-06 -1.6232  0.10612
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.26008074  0.11788070  2.2063  0.02850 *
## Edad_t           -0.00756483  0.00365494 -2.0698  0.03975 *
## Anios_de_contrato_t -0.01068452  0.00766689 -1.3936  0.16498
## X_Comando_t        0.00197374  0.01215885  0.1623  0.87121
## X_Comando_t_1      -0.00091687  0.00074075 -1.2378  0.21725
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2563217  0.1191035  2.1521 0.0325823 *
## Edad_t           -0.0080600  0.0036713 -2.1954 0.0292797 *
## Anios_de_contrato_t -0.0098298  0.0077283 -1.2719 0.2048705
## X_Control_2_t      -0.0437028  0.0419650 -1.0414 0.2989366
## X_Control_2_t_1     -0.1171189  0.0310585 -3.7709 0.0002138 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2319650  0.1168355  1.9854  0.04846 *
## Edad_t           -0.0068950  0.0035938 -1.9186  0.05646 .

```

```

## Anios_de_contrato_t -0.0104710  0.0074080 -1.4135  0.15906
## X_Control_t         0.0519428  0.0293971  1.7669  0.07876 .
## X_Control_t_1       -0.0754652  0.0298191 -2.5308  0.01215 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.20634163  0.12738030  1.6199  0.1068
## Edad_t           -0.00555109  0.00382413 -1.4516  0.1482
## Anios_de_contrato_t -0.01081058  0.00759007 -1.4243  0.1559
## X_Dominio_2_t     -0.00020277  0.02239861 -0.0091  0.9928
## X_Dominio_2_t_1     0.04706752  0.02094237  2.2475  0.0257 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1990236  0.1291490  1.5410  0.12488
## Edad_t           -0.0053098  0.0039165 -1.3558  0.17670
## Anios_de_contrato_t -0.0110402  0.0076784 -1.4378  0.15204
## X_Dominio_t       -0.0101916  0.0196314 -0.5191  0.60423
## X_Dominio_t_1      0.0526430  0.0181246  2.9045  0.00409 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2435061  0.1246060  1.9542  0.05206 .
## Edad_t           -0.0074306  0.0038085 -1.9511  0.05244 .
## Anios_de_contrato_t -0.0094828  0.0084769 -1.1187  0.26462
## X_ERA_2_t         -0.0005705  0.0025494 -0.2238  0.82316
## X_ERA_2_t_1       -0.0066096  0.0026257 -2.5173  0.01261 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2453025  0.1145417  2.1416 0.0334293 *
## Edad_t           -0.0072087  0.0034789 -2.0721 0.0395321 *
## Anios_de_contrato_t -0.0112352  0.0081688 -1.3754 0.1705450
## X_ERA_t           -0.0099491  0.0062475 -1.5925 0.1128449
## X_ERA_t_1         -0.0214214  0.0063727 -3.3614 0.0009281 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##

```

```

##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.4355e-01  1.1794e-01  2.0650  0.04021 *
## Edad_t           -7.2086e-03  3.6576e-03 -1.9708  0.05012 .
## Anios_de_contrato_t -6.4694e-03  7.6751e-03 -0.8429  0.40028
## X_Inning_pitched_2_t -1.3430e-04  1.1207e-04 -1.1984  0.23218
## X_Inning_pitched_2_t_1 3.8482e-06  7.3197e-05  0.0526  0.95812
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.25786688  0.12849327  2.0069  0.04611 *
## Edad_t           -0.00747116  0.00393949 -1.8965  0.05933 .
## Anios_de_contrato_t -0.00928800  0.00813218 -1.1421  0.25476
## X_Inning_pitched_t -0.00054833  0.00144095 -0.3805  0.70395
## X_Inning_pitched_t_1 -0.00026570  0.00116142 -0.2288  0.81928
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.25117468  0.12813602  1.9602  0.05135 .
## Edad_t           -0.00728362  0.00395321 -1.8425  0.06688 .
## Anios_de_contrato_t -0.01026310  0.00732795 -1.4005  0.16289
## X_Losses_2_t      -0.00183998  0.00181725 -1.0125  0.31251
## X_Losses_2_t_1    -0.00080825  0.00104680 -0.7721  0.44096
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2587681  0.1253630  2.0641  0.04029 *
## Edad_t           -0.0074287  0.0038533 -1.9279  0.05528 .
## Anios_de_contrato_t -0.0098483  0.0075175 -1.3101  0.19167
## X_Losses_t        -0.0054604  0.0061953 -0.8814  0.37917
## X_Losses_t_1      -0.0039126  0.0040348 -0.9697  0.33334
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3059566  0.1427032  2.1440  0.033233 *
## Edad_t           -0.0088646  0.0043073 -2.0580  0.040877 *

```

```

## Anios_de_contrato_t -0.0116344  0.0080472 -1.4458 0.149796
## X_Saves_2_t          0.1099373  0.0807513  1.3614 0.174902
## X_Saves_2_t_1        0.0181382  0.0067968  2.6686 0.008238 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3180413  0.1439217  2.2098 0.02825 *
## Edad_t           -0.0091733  0.0043233 -2.1218 0.03508 *
## Anios_de_contrato_t -0.0120727  0.0081042 -1.4897 0.13787
## X_Saves_t         0.0635158  0.0504189  1.2598 0.20922
## X_Saves_t_1       0.0565259  0.0288934  1.9564 0.05181 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.6924e-01  1.1915e-01  2.2596 0.02492 *
## Edad_t           -7.9781e-03  3.6545e-03 -2.1831 0.03019 *
## Anios_de_contrato_t -8.3357e-03  8.1063e-03 -1.0283 0.30505
## X_Strike_outs_2_t -8.5259e-05  1.0359e-04 -0.8231 0.41144
## X_Strike_outs_2_t_1 1.1304e-04  1.0505e-04  1.0761 0.28319
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.27451549  0.12614714  2.1762 0.03071 *
## Edad_t           -0.00797433  0.00388232 -2.0540 0.04127 *
## Anios_de_contrato_t -0.01140295  0.00789121 -1.4450 0.15001
## X_Strike_outs_t     0.00036804  0.00136597  0.2694 0.78787
## X_Strike_outs_t_1  -0.00017561  0.00119684 -0.1467 0.88350
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.27356806  0.11887088  2.3014 0.02239 *
## Edad_t           -0.00792896  0.00367063 -2.1601 0.03195 *
## Anios_de_contrato_t -0.01092035  0.00746015 -1.4638 0.14480
## X_WAR_2_t         0.00221814  0.00432208  0.5132 0.60837
## X_WAR_2_t_1       -0.00059811  0.00537679 -0.1112 0.91154
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##

```



```

##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3015254  0.1246743   2.4185  0.01648 *
## Edad_t           -0.0085468  0.0038561  -2.2165  0.02778 *
## Anios_de_contrato_t -0.0143125  0.0077162  -1.8549  0.06508 .
## X_WAR_t           0.0120416  0.0095286   1.2637  0.20779
## X_WAR_t_1         0.0076555  0.0121188   0.6317  0.52830
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1878250  0.1121191   1.6752  0.09544 .
## Edad_t           -0.0057394  0.0033914  -1.6923  0.09214 .
## Anios_de_contrato_t -0.0122532  0.0083559  -1.4664  0.14410
## X_WHIP_2_t        -0.0069118  0.0107870  -0.6408  0.52241
## X_WHIP_2_t_1      -0.0425507  0.0105468  -4.0345 7.773e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2815852  0.1157767   2.4321  0.01589 *
## Edad_t           -0.0081903  0.0035433  -2.3115  0.02182 *
## Anios_de_contrato_t -0.0127539  0.0081598  -1.5630  0.11962
## X_WHIP_t          -0.0030496  0.0105784  -0.2883  0.77343
## X_WHIP_t_1        -0.0349602  0.0115478  -3.0274  0.00279 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.6928e-01  1.2238e-01   2.2003  0.02893 *
## Edad_t           -7.8474e-03  3.7523e-03  -2.0913  0.03776 *
## Anios_de_contrato_t -1.0191e-02  7.7287e-03  -1.3186  0.18881
## X_Walks_2_t       -1.6692e-04  3.5797e-04  -0.4663  0.64150
## X_Walks_2_t_1      4.7151e-05  2.6979e-04   0.1748  0.86144
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2808068  0.1310234   2.1432  0.03330 *
## Edad_t           -0.0081002  0.0040547  -1.9977  0.04709 *

```

```
## Anios_de_contrato_t -0.0121487 0.0078681 -1.5441 0.12415
## X_Walks_t          0.0014017 0.0025825 0.5428 0.58790
## X_Walks_t_1        -0.0024884 0.0023674 -1.0511 0.29447
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.7348e-01 1.2156e-01  2.2498 0.02555 *
## Edad_t         -7.9182e-03 3.7468e-03 -2.1133 0.03580 *
## Anios_de_contrato_t -1.1319e-02 7.8220e-03 -1.4470 0.14945
## X_Wins_2_t      3.6003e-04 1.2147e-03  0.2964 0.76724
## X_Wins_2_t_1    4.3973e-05 1.3400e-03  0.0328 0.97385
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.2469076 0.1285293  1.9210 0.05614 .
## Edad_t         -0.0072390 0.0039521 -1.8317 0.06848 .
## Anios_de_contrato_t -0.0079873 0.0076150 -1.0489 0.29549
## X_Wins_t       -0.0050115 0.0056267 -0.8907 0.37417
## X_Wins_t_1      0.0007595 0.0046310  0.1640 0.86989
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Efectos fijos

Bateadores

Se obtendrán las estimaciones de las variables referentes a estadísticas deportivas sin controles

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_hitter_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_h <- paste(vars, stat_hitter_t[[i]],
                        sep = '+')
  formula <- paste(base_vars_h,
                   stat_hitter_t_1[[i]],
                   sep = " + ")

  h_m_fix_ef <- plm(formula, data = hitter_data,
                    model = "within",
                    index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(h_m_fix_ef,
                           vcov = vcovHC(h_m_fix_ef,
                                           type = "HC1",
                                           cluster = "group"))
```

```
print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.00282253  0.00617010 -0.4575  0.64779
## Anios_de_contrato_t -0.03262326  0.01257720 -2.5938  0.01013 *
## X_At_bats_t      0.00080400  0.00086358  0.9310  0.35287
## X_At_bats_t_1     0.00031969  0.00090917  0.3516  0.72545
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -3.6564e-03  5.5960e-03 -0.6534  0.51418
## Anios_de_contrato_t -3.1958e-02  1.2747e-02 -2.5072  0.01289 *
## X_At_bats_2_t      5.7183e-06  3.9145e-05  0.1461  0.88399
## X_At_bats_2_t_1     2.8160e-06  3.8987e-05  0.0722  0.94249
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.00385755  0.00563707 -0.6843  0.49449
## Anios_de_contrato_t -0.03176958  0.01256725 -2.5280  0.01217 *
## X_Bateos_t       -0.00024164  0.00169224 -0.1428  0.88658
## X_Bateos_t_1     -0.00018235  0.00167100 -0.1091  0.91320
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.00389306  0.00522153 -0.7456  0.45671
## Anios_de_contrato_t -0.03101865  0.01241733 -2.4980  0.01322 *
## X_Bateos_2_t     -0.00013657  0.00019982 -0.6835  0.49503
## X_Bateos_2_t_1   -0.00010511  0.00017124 -0.6138  0.53995
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0038253  0.0053050 -0.7211  0.47163
## Anios_de_contrato_t -0.0308669  0.0122750 -2.5146  0.01263 *
```

```

## X_Bateos_promedio_t    -0.0060976  0.0294032 -0.2074  0.83590
## X_Bateos_promedio_t_1  0.0307148  0.0278445  1.1031  0.27119
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.0036710  0.0051412 -0.7140  0.47597
## Anios_de_contrato_t -0.0317337  0.0123376 -2.5721  0.01076 *
## X_Bateos_promedio_2_t -0.0030552  0.0465350 -0.0657  0.94771
## X_Bateos_promedio_2_t_1  0.0058181  0.0243392  0.2390  0.81129
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.00386045  0.00524013 -0.7367  0.46208
## Anios_de_contrato_t -0.03176529  0.01236961 -2.5680  0.01089 *
## X_Dobles_t        0.00069127  0.00476932  0.1449  0.88489
## X_Dobles_t_1      -0.00140625  0.00317378 -0.4431  0.65814
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          -3.7364e-03  5.2388e-03 -0.7132  0.47646
## Anios_de_contrato_t -3.1996e-02  1.2536e-02 -2.5524  0.01137 *
## X_Dobles_2_t       4.0808e-05  8.6846e-04  0.0470  0.96256
## X_Dobles_2_t_1     -3.7432e-04  5.7181e-04 -0.6546  0.51339
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.0036561  0.0053501 -0.6834  0.495083
## Anios_de_contrato_t -0.0340427  0.0127583 -2.6683  0.008189 **
## X_Home_runs_t      0.0056910  0.0051121  1.1132  0.266821
## X_Home_runs_t_1     0.0014058  0.0038775  0.3626  0.717285
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.00413877  0.00512771 -0.8071  0.420455

```

```

## Anios_de_contrato_t -0.03448575  0.01295013 -2.6630 0.008315 **
## X_Home_runs_2_t      0.00103379  0.00094131  1.0982 0.273296
## X_Home_runs_2_t_1    -0.00022749  0.00060568 -0.3756 0.707583
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.00323591  0.00588313 -0.5500  0.5829
## Anios_de_contrato_t -0.03242663  0.01254749 -2.5843  0.0104 *
## X_Juegos_iniciados_t  0.00102636  0.00179604  0.5715  0.5683
## X_Juegos_iniciados_t_1 0.00019984  0.00167513  0.1193  0.9051
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -3.5429e-03  5.7059e-03 -0.6209  0.53529
## Anios_de_contrato_t -3.1617e-02  1.2604e-02 -2.5085  0.01284 *
## X_Juegos_iniciados_2_t  1.2599e-04  1.6465e-04  0.7652  0.44497
## X_Juegos_iniciados_2_t_1 1.6114e-05  1.5189e-04  0.1061  0.91561
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.0038868  0.0054834 -0.7088  0.47917
## Anios_de_contrato_t -0.0312576  0.0124607 -2.5085  0.01284 *
## X_Porcentaje_On_base_plus_slugging_t -0.0131157  0.0191512 -0.6849  0.49416
## X_Porcentaje_On_base_plus_slugging_t_1 -0.0026892  0.0184392 -0.1458  0.88418
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.0037245  0.0051087 -0.7291  0.46674
## Anios_de_contrato_t -0.0318574  0.0125725 -2.5339  0.01197
## X_Porcentaje_On_base_plus_slugging_2_t -0.0017226  0.0190741 -0.0903  0.92812
## X_Porcentaje_On_base_plus_slugging_2_t_1 -0.0054140  0.0158322 -0.3420  0.73270
##
## Edad_t
## Anios_de_contrato_t *
## X_Porcentaje_On_base_plus_slugging_2_t
## X_Porcentaje_On_base_plus_slugging_2_t_1
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```

##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.0037240  0.0054824 -0.6793  0.49768
## Anios_de_contrato_t -0.0314263  0.0124296 -2.5283  0.01216 *
## X_Porcentaje_on_base_t -0.0033352  0.0401610 -0.0830  0.93389
## X_Porcentaje_on_base_t_1 0.0274391  0.0321149  0.8544  0.39381
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.0041872  0.0051506 -0.8129  0.41712
## Anios_de_contrato_t -0.0330630  0.0127392 -2.5954  0.01008 *
## X_Porcentaje_on_base_2_t  0.0472019  0.0469128  1.0062  0.31544
## X_Porcentaje_on_base_2_t_1 0.0213773  0.0268406  0.7965  0.42662
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.0039672  0.0051090 -0.7765  0.43828
## Anios_de_contrato_t -0.0303238  0.0128473 -2.3603  0.01913 *
## X_Porcentaje_slugging_t -0.0131800  0.0251764 -0.5235  0.60115
## X_Porcentaje_slugging_t_1 -0.0282677  0.0306289 -0.9229  0.35706
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.0038213  0.0051922 -0.7360  0.462527
## Anios_de_contrato_t -0.0329162  0.0125274 -2.6275  0.009203 **
## X_Porcentaje_slugging_2_t  0.0172435  0.0289002  0.5967  0.551346
## X_Porcentaje_slugging_2_t_1 -0.0187568  0.0288888 -0.6493  0.516834
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.0032871  0.0057061 -0.5761  0.5652
## Anios_de_contrato_t -0.0335850  0.0129778 -2.5879  0.0103 *
## X_Runs_batted_in_t  0.0014477  0.0022682  0.6382  0.5240
## X_Runs_batted_in_t_1 0.0013102  0.0023104  0.5671  0.5712
## ---

```

```

## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.00416783  0.00517496 -0.8054 0.421463
## Anios_de_contrato_t -0.03241534  0.01240084 -2.6140 0.009565 **
## X_Runs_batted_in_2_t  0.00016399  0.00036630  0.4477 0.654805
## X_Runs_batted_in_2_t_1 -0.00015000  0.00024970 -0.6007 0.548641
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0023333  0.0052097 -0.4479 0.654686
## Anios_de_contrato_t -0.0338272  0.0127969 -2.6434 0.008796 **
## X_Triples_t     -0.0212018  0.0137730 -1.5394 0.125144
## X_Triples_t_1    0.0016130  0.0142970  0.1128 0.910278
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0034891  0.0055849 -0.6247 0.53279
## Anios_de_contrato_t -0.0320435  0.0128195 -2.4996 0.01316 *
## X_Triples_2_t    -0.0017197  0.0049111 -0.3502 0.72654
## X_Triples_2_t_1   0.0011302  0.0035453  0.3188 0.75019
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0063846  0.0046309 -1.3787 0.1693807
## Anios_de_contrato_t -0.0390338  0.0126008 -3.0977 0.0022030 **
## X_WAR_t        0.0353942  0.0094984  3.7263 0.0002468 ***
## X_WAR_t_1      0.0027886  0.0083087  0.3356 0.7374754
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.00448813  0.00457891 -0.9802 0.328071
## Anios_de_contrato_t -0.03550346  0.01334912 -2.6596 0.008396 **
## X_WAR_2_t      0.01103007  0.00824395  1.3380 0.182284
## X_WAR_2_t_1    -0.00035452  0.00338266 -0.1048 0.916625

```

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

Starting pitcher

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_field_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_s <- paste(vars, stat_field_t_1[[i]],
                        sep = '+')
  formula <- paste(base_vars_s,
                    stat_field_t_1[[i]],
                    sep = " + ")

  s_m_fix_ef <- plm(formula, data = starting_data,
                    model = "within",
                    index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(s_m_fix_ef,
                           vcov = vcovHC(s_m_fix_ef,
                                           type = "HC1",
                                           cluster = "group"))

  print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.02835323  0.01526274 -1.8577  0.06672 .
## Anios_de_contrato_t -0.01759156  0.01865445 -0.9430  0.34837
## X_Bateos_2_t     -0.00020080  0.00017418 -1.1528  0.25225
## X_Bateos_2_t_1   -0.00011333  0.00010995 -1.0307  0.30564
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0275851  0.0145979 -1.8897  0.06225 .
## Anios_de_contrato_t -0.0352421  0.0208092 -1.6936  0.09405 .
## X_Bateos_t      0.0028865  0.0025127  1.1488  0.25391
## X_Bateos_t_1    -0.0016864  0.0017456 -0.9661  0.33677
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
```



```

## Edad_t          -2.8555e-02  1.5881e-02 -1.7980  0.07576 .
## Anios_de_contrato_t -2.7518e-02  1.8866e-02 -1.4586  0.14841
## X_Carreras_2_t      7.3181e-05  3.2396e-04  0.2259  0.82183
## X_Carreras_2_t_1    -2.9346e-04  2.2935e-04 -1.2795  0.20424
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.02876330  0.01588822 -1.8104  0.07382 .
## Anios_de_contrato_t -0.02433888  0.01685714 -1.4438  0.15251
## X_Carreras_ganadas_2_t -0.00019540  0.00038437 -0.5084  0.61253
## X_Carreras_ganadas_2_t_1 -0.00039563  0.00027372 -1.4454  0.15207
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.02577889  0.01490877 -1.7291  0.08746 .
## Anios_de_contrato_t -0.03083684  0.02023605 -1.5239  0.13130
## X_Carreras_ganadas_t  0.00234282  0.00231323  1.0128  0.31407
## X_Carreras_ganadas_t_1 -0.00012964  0.00210259 -0.0617  0.95098
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.0249612  0.0148895 -1.6764  0.09737 .
## Anios_de_contrato_t -0.0324485  0.0207801 -1.5615  0.12216
## X_Carreras_t      0.0029448  0.0022567  1.3049  0.19549
## X_Carreras_t_1    0.0010638  0.0017795  0.5978  0.55157
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -2.6624e-02  1.4487e-02 -1.8377  0.06964 .
## Anios_de_contrato_t -2.5165e-02  2.1507e-02 -1.1701  0.24527
## X_Comando_2_t     -1.1557e-02  8.2523e-03 -1.4004  0.16507
## X_Comando_2_t_1    5.2440e-06  3.3117e-06  1.5835  0.11707
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##

```

```

##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.02649071  0.01425725 -1.8581  0.06666 .
## Anios_de_contrato_t -0.02831779  0.02316659 -1.2224  0.22499
## X_Comando_t      0.00289010  0.02225204  0.1299  0.89697
## X_Comando_t_1     0.00039192  0.00065476  0.5986  0.55107
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.024976  0.016168 -1.5448  0.1261
## Anios_de_contrato_t -0.026153  0.021394 -1.2224  0.2250
## X_Control_2_t     0.025893  0.085289  0.3036  0.7622
## X_Control_2_t_1   -0.017229  0.050521 -0.3410  0.7339
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.024372  0.015203 -1.6031  0.1127
## Anios_de_contrato_t -0.026620  0.019895 -1.3380  0.1845
## X_Control_t       0.054838  0.070781  0.7748  0.4407
## X_Control_t_1     -0.049245  0.053014 -0.9289  0.3556
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0260298  0.0150210 -1.7329  0.08678 .
## Anios_de_contrato_t -0.0256619  0.0209001 -1.2278  0.22294
## X_Dominio_2_t     -0.0116437  0.0247037 -0.4713  0.63862
## X_Dominio_2_t_1    0.0070104  0.0293426  0.2389  0.81175
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0248305  0.0146666 -1.6930  0.09416 .
## Anios_de_contrato_t -0.0309122  0.0203680 -1.5177  0.13285
## X_Dominio_t        0.0297765  0.0289403  1.0289  0.30648
## X_Dominio_t_1      0.0095241  0.0306963  0.3103  0.75713
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0204264  0.0149531 -1.3660  0.1756
## Anios_de_contrato_t -0.0167126  0.0196305 -0.8514  0.3970

```

```

## X_ERA_2_t          0.0078469  0.0060004  1.3077  0.1945
## X_ERA_2_t_1        -0.0024092  0.0060949 -0.3953  0.6936
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0195687  0.0136044 -1.4384  0.15403
## Anios_de_contrato_t -0.0229607  0.0200875 -1.1430  0.25627
## X_ERA_t         0.0036492  0.0135136  0.2700  0.78779
## X_ERA_t_1       -0.0253767  0.0120976 -2.0977  0.03894 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t        -2.7091e-02  1.5342e-02 -1.7658  0.08106 .
## Anios_de_contrato_t -2.1297e-02  1.8652e-02 -1.1418  0.25676
## X_Inning_pitched_2_t -7.6656e-05  1.5650e-04 -0.4898  0.62554
## X_Inning_pitched_2_t_1 -8.1454e-05  1.1619e-04 -0.7011  0.48521
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.02804828  0.01573463 -1.7826  0.07827 .
## Anios_de_contrato_t -0.02926516  0.02196667 -1.3323  0.18638
## X_Inning_pitched_t  0.00061567  0.00182192  0.3379  0.73626
## X_Inning_pitched_t_1 -0.00127737  0.00186089 -0.6864  0.49433
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0278156  0.0147992 -1.8795  0.06364 .
## Anios_de_contrato_t -0.0257988  0.0183072 -1.4092  0.16246
## X_Losses_2_t     -0.0017497  0.0034822 -0.5025  0.61665
## X_Losses_2_t_1   -0.0015326  0.0013594 -1.1274  0.26277
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0266363  0.0146437 -1.8190  0.07248 .
## Anios_de_contrato_t -0.0271043  0.0186428 -1.4539  0.14971
## X_Losses_t       0.0016144  0.0099041  0.1630  0.87090

```

```

## X_Losses_t_1      -0.0089014  0.0066917 -1.3302  0.18704
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t      -0.02638136  0.01504267  -1.7538  0.08312 .
## Anios_de_contrato_t -0.02695004  0.02029300  -1.3280  0.18776
## X_Saves_2_t      0.09563766  0.00087128 109.7672 < 2e-16 ***
## X_Saves_2_t_1     0.01770259  0.01506733   1.1749  0.24335
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t      -0.0263794  0.0151136  -1.7454  0.08457 .
## Anios_de_contrato_t -0.0270585  0.0202994  -1.3330  0.18615
## X_Saves_t      0.0633998  0.0020886  30.3546 < 2e-16 ***
## X_Saves_t_1     0.0242456  0.0403167   0.6014  0.54921
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t      -2.5340e-02  1.4546e-02  -1.7420  0.08517 .
## Anios_de_contrato_t -2.8948e-02  2.0777e-02  -1.3933  0.16720
## X_Strike_outs_2_t   -3.4876e-05  1.0721e-04  -0.3253  0.74577
## X_Strike_outs_2_t_1  2.2926e-04  1.6267e-04   1.4094  0.16241
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t      -2.7110e-02  1.5233e-02  -1.7796  0.07875 .
## Anios_de_contrato_t -3.4607e-02  2.1662e-02  -1.5976  0.11388
## X_Strike_outs_t      2.1158e-03  1.4752e-03   1.4342  0.15521
## X_Strike_outs_t_1    -6.2378e-05  1.5992e-03  -0.0390  0.96898
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t      -0.0247583  0.0140244  -1.7654  0.08113 .
## Anios_de_contrato_t -0.0216533  0.0235010  -0.9214  0.35949

```

```

## X_WAR_2_t          -0.0017630  0.0034842 -0.5060  0.61418
## X_WAR_2_t_1        -0.0063217  0.0038312 -1.6501  0.10267
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.02630051  0.01528067 -1.7212  0.0889 .
## Anios_de_contrato_t -0.02618054  0.02401952 -1.0900  0.2788
## X_WAR_t           0.00053268  0.01227979  0.0434  0.9655
## X_WAR_t_1         -0.00481315  0.01883085 -0.2556  0.7989
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.020023  0.014736 -1.3588  0.1779
## Anios_de_contrato_t -0.017491  0.019238 -0.9092  0.3658
## X_WHIP_2_t        0.026072  0.019906  1.3097  0.1939
## X_WHIP_2_t_1      -0.015202  0.016537 -0.9193  0.3606
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.023677  0.015726 -1.5055  0.1359
## Anios_de_contrato_t -0.020548  0.018818 -1.0919  0.2780
## X_WHIP_t          0.023460  0.021597  1.0863  0.2805
## X_WHIP_t_1        -0.012851  0.021240 -0.6050  0.5468
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.02525390  0.01419557 -1.7790  0.07886 .
## Anios_de_contrato_t -0.02797916  0.01829302 -1.5295  0.12990
## X_Walks_2_t        0.00013305  0.00061426  0.2166  0.82904
## X_Walks_2_t_1      0.00018289  0.00041789  0.4376  0.66277
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.02562928  0.01447792 -1.7702  0.08032 .
## Anios_de_contrato_t -0.02800851  0.01915466 -1.4622  0.14741
## X_Walks_t          0.00058211  0.00321943  0.1808  0.85695
## X_Walks_t_1        0.00068769  0.00331314  0.2076  0.83607
## ---

```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.0284886   0.0160199  -1.7783  0.07897 .
## Anios_de_contrato_t -0.0293592   0.0212953  -1.3787  0.17166
## X_Wins_2_t         0.0010692   0.0016502   0.6479  0.51879
## X_Wins_2_t_1       -0.0011755   0.0014101  -0.8336  0.40685
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.0265902   0.0154038  -1.7262  0.08799 .
## Anios_de_contrato_t -0.0238769   0.0189239  -1.2617  0.21054
## X_Wins_t         -0.0016806   0.0063837  -0.2633  0.79299
## X_Wins_t_1       -0.0031054   0.0054248  -0.5724  0.56855
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Efectos aleatorios

Bateadores

Se obtendrán las estimaciones de las variables referentes a estadísticas deportivas sin controles

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_hitter_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_h <- paste(vars, stat_hitter_t[[i]],
                        sep = '+')
  formula <- paste(base_vars_h,
                    stat_hitter_t_1[[i]],
                    sep = " + ")

  h_m_random <- plm(formula, data = hitter_data,
                     model = "random",
                     index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(h_m_random,
                            vcov = vcovHC(h_m_random,
                                           type = "HC1",
                                           cluster = "group"))

  print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
```

```

##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.16725295  0.08361522  2.0003  0.04598 *
## Edad_t          -0.00564779  0.00269514 -2.0955  0.03659 *
## Anios_de_contrato_t -0.00205510  0.00402889 -0.5101  0.61020
## X_At_bats_t      -0.00022683  0.00052412 -0.4328  0.66534
## X_At_bats_t_1    -0.00044128  0.00055075 -0.8012  0.42335
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.6054e-01  8.0416e-02  1.9964  0.0464 *
## Edad_t          -5.4158e-03  2.5776e-03 -2.1011  0.0361 *
## Anios_de_contrato_t -3.0963e-03  3.8875e-03 -0.7965  0.4261
## X_At_bats_2_t     -6.8462e-06  3.0591e-05 -0.2238  0.8230
## X_At_bats_2_t_1   -8.8556e-07  2.2263e-05 -0.0398  0.9683
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.15787981  0.08059192  1.9590  0.05063 .
## Edad_t          -0.00535737  0.00258822 -2.0699  0.03894 *
## Anios_de_contrato_t -0.00206051  0.00390780 -0.5273  0.59822
## X_Bateos_t       -0.00145268  0.00100355 -1.4475  0.14833
## X_Bateos_t_1      0.00018488  0.00087392  0.2115  0.83254
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.5433e-01  8.2277e-02  1.8757  0.06124 .
## Edad_t          -5.2280e-03  2.6115e-03 -2.0019  0.04580 *
## Anios_de_contrato_t -2.8440e-03  3.9951e-03 -0.7119  0.47686
## X_Bateos_2_t     -1.0277e-04  9.8373e-05 -1.0447  0.29664
## X_Bateos_2_t_1    5.0666e-05  9.3455e-05  0.5421  0.58794
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1555953  0.0823366  1.8897  0.05933 .
## Edad_t          -0.0052931  0.0026147 -2.0244  0.04343 *
## Anios_de_contrato_t -0.0027275  0.0035218 -0.7745  0.43900
## X_Bateos_promedio_t -0.0236783  0.0176268 -1.3433  0.17974

```

```

## X_Bateos_promedio_t_1 0.0176122 0.0159722 1.1027 0.27066
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1512916  0.0813107  1.8607  0.06334 .
## Edad_t           -0.0051308  0.0025984 -1.9746  0.04883 *
## Anios_de_contrato_t -0.0027488  0.0035064 -0.7839  0.43342
## X_Bateos_promedio_2_t -0.0378649  0.0278748 -1.3584  0.17491
## X_Bateos_promedio_2_t_1 0.0034542  0.0157721  0.2190  0.82673
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1549607  0.0774181  2.0016  0.04583 *
## Edad_t           -0.0053274  0.0025047 -2.1270  0.03388 *
## Anios_de_contrato_t -0.0014844  0.0041842 -0.3548  0.72292
## X_Dobles_t        -0.0026677  0.0029153 -0.9151  0.36056
## X_Dobles_t_1      -0.0012990  0.0023723 -0.5476  0.58422
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.15804896  0.08167620  1.9351  0.05351 .
## Edad_t           -0.00532346  0.00259492 -2.0515  0.04071 *
## Anios_de_contrato_t -0.00299338  0.00389006 -0.7695  0.44194
## X_Dobles_2_t      -0.00026364  0.00047624 -0.5536  0.58009
## X_Dobles_2_t_1     0.00032612  0.00042986  0.7587  0.44839
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.15750071  0.08161708  1.9298  0.05417 .
## Edad_t           -0.00525186  0.00262078 -2.0039  0.04558 *
## Anios_de_contrato_t -0.00390299  0.00363880 -1.0726  0.28393
## X_Home_runs_t      0.00041905  0.00343230  0.1221  0.90287
## X_Home_runs_t_1     0.00239846  0.00211751  1.1327  0.25786
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:

```



```

##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.5914e-01  8.1306e-02  1.9572  0.05084 .
## Edad_t           -5.3907e-03  2.5949e-03 -2.0774  0.03824 *
## Anios_de_contrato_t -3.0702e-03  3.5832e-03 -0.8568  0.39193
## X_Home_runs_2_t    -3.7952e-04  6.9545e-04 -0.5457  0.58548
## X_Home_runs_2_t_1   2.0734e-06  3.0892e-04  0.0067  0.99465
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.16748998  0.08243796  2.0317  0.04268 *
## Edad_t           -0.00569099  0.00266666 -2.1341  0.03329 *
## Anios_de_contrato_t -0.00162675  0.00395332 -0.4115  0.68088
## X_Juegos_iniciados_t -0.00104203  0.00095621 -1.0898  0.27631
## X_Juegos_iniciados_t_1 -0.00083684  0.00104889 -0.7978  0.42532
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.5979e-01  8.0679e-02  1.9806  0.04815 *
## Edad_t           -5.3487e-03  2.5887e-03 -2.0662  0.03929 *
## Anios_de_contrato_t -3.7208e-03  3.8735e-03 -0.9606  0.33720
## X_Juegos_iniciados_2_t -3.9693e-06  1.3196e-04 -0.0301  0.97602
## X_Juegos_iniciados_2_t_1 3.9830e-05  9.2350e-05  0.4313  0.66643
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1656997  0.0828533  1.9999  0.04602 *
## Edad_t           -0.0054074  0.0026197 -2.0641  0.03949 *
## Anios_de_contrato_t -0.0026087  0.0035891 -0.7268  0.46765
## X_Porcentaje_On_base_plus_slugging_t -0.0186144  0.0124728 -1.4924  0.13619
## X_Porcentaje_On_base_plus_slugging_t_1 -0.0023574  0.0115030 -0.2049  0.83770
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1466292  0.0830340  1.7659  0.07799
## Edad_t           -0.0050084  0.0026532 -1.8877  0.05961
## Anios_de_contrato_t -0.0021648  0.0037380 -0.5791  0.56274
## X_Porcentaje_On_base_plus_slugging_2_t -0.0197173  0.0112901 -1.7464  0.08131

```

```

## X_Porcentaje_On_base_plus_slugging_2_t_1 0.0054894 0.0102648 0.5348 0.59302
##
## (Intercept) .
## Edad_t .
## Anios_de_contrato_t
## X_Porcentaje_On_base_plus_slugging_2_t .
## X_Porcentaje_On_base_plus_slugging_2_t_1
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.1616775 0.0816157 1.9810 0.04811 *
## Edad_t -0.0053914 0.0025838 -2.0866 0.03740 *
## Anios_de_contrato_t -0.0029615 0.0035101 -0.8437 0.39921
## X_Porcentaje_on_base_t -0.0331752 0.0208108 -1.5941 0.11150
## X_Porcentaje_on_base_t_1 0.0178704 0.0179059 0.9980 0.31872
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.1528109 0.0795651 1.9206 0.05532 .
## Edad_t -0.0051769 0.0025403 -2.0379 0.04205 *
## Anios_de_contrato_t -0.0026991 0.0035554 -0.7591 0.44810
## X_Porcentaje_on_base_2_t -0.0295746 0.0267191 -1.1069 0.26885
## X_Porcentaje_on_base_2_t_1 0.0065481 0.0180640 0.3625 0.71713
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.1713160 0.0794708 2.1557 0.03155 *
## Edad_t -0.0055415 0.0025265 -2.1934 0.02871 *
## Anios_de_contrato_t -0.0019798 0.0036943 -0.5359 0.59225
## X_Porcentaje_slugging_t -0.0133956 0.0158032 -0.8476 0.39701
## X_Porcentaje_slugging_t_1 -0.0251948 0.0151256 -1.6657 0.09636 .
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.1561831 0.0835758 1.8688 0.06220 .
## Edad_t -0.0053243 0.0026741 -1.9910 0.04699 *
## Anios_de_contrato_t -0.0023567 0.0037691 -0.6253 0.53206
## X_Porcentaje_slugging_2_t -0.0255255 0.0184593 -1.3828 0.16731

```

```

## X_Porcentaje_slugging_2_t_1 0.0068615 0.0174750 0.3926 0.69474
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.15838218 0.08182885  1.9355 0.05345 .
## Edad_t         -0.00534981 0.00265153 -2.0176 0.04413 *
## Anios_de_contrato_t -0.00245212 0.00407486 -0.6018 0.54758
## X_Runs_batted_in_t -0.00199101 0.00134067 -1.4851 0.13811
## X_Runs_batted_in_t_1 0.00069176 0.00150326  0.4602 0.64558
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.6391e-01 8.0893e-02  2.0262 0.04324 *
## Edad_t         -5.4532e-03 2.5792e-03 -2.1142 0.03496 *
## Anios_de_contrato_t -3.9073e-03 3.7464e-03 -1.0429 0.29744
## X_Runs_batted_in_2_t 9.4128e-05 2.1395e-04  0.4400 0.66015
## X_Runs_batted_in_2_t_1 5.0008e-05 1.6253e-04  0.3077 0.75845
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.1544175 0.0815637  1.8932 0.05887 .
## Edad_t         -0.0052046 0.0026069 -1.9965 0.04639 *
## Anios_de_contrato_t -0.0035723 0.0036050 -0.9909 0.32217
## X_Triples_t     -0.0098760 0.0078792 -1.2534 0.21060
## X_Triples_t_1    0.0108671 0.0052954  2.0522 0.04064 *
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.15680838 0.08226242  1.9062 0.05716 .
## Edad_t         -0.00528348 0.00262318 -2.0141 0.04450 *
## Anios_de_contrato_t -0.00331205 0.00352741 -0.9389 0.34818
## X_Triples_2_t   -0.00146546 0.00314633 -0.4658 0.64157
## X_Triples_2_t_1  0.00113895 0.00092729  1.2283 0.21989
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:

```

```
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2103006  0.0819246  2.5670  0.01053 *
## Edad_t           -0.0064743  0.0025978 -2.4922  0.01300 *
## Anios_de_contrato_t -0.0080432  0.0041206 -1.9519  0.05147 .
## X_WAR_t           0.0186101  0.0062267  2.9888  0.00293 **
## X_WAR_t_1         0.0096149  0.0052290  1.8388  0.06651 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1771279  0.0768953  2.3035  0.02163 *
## Edad_t           -0.0057263  0.0024744 -2.3142  0.02104 *
## Anios_de_contrato_t -0.0044097  0.0037964 -1.1615  0.24594
## X_WAR_2_t         0.0054581  0.0034090  1.6011  0.10996
## X_WAR_2_t_1       0.0034900  0.0019102  1.8270  0.06825 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Starting pitcher

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_fielder_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_s <- paste(vars, stat_fielder_t[[i]],
                        sep = '+')
  formula <- paste(base_vars_s,
                   stat_fielder_t_1[[i]],
                   sep = " + ")

  s_m_random <- plm(formula, data = starting_data,
                    model = "random",
                    index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(s_m_random,
                           vcov = vcovHC(s_m_random,
                                           type = "HC1",
                                           cluster = "group"))

  print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.9999e-01  1.5034e-01  1.9954  0.04735 *
## Edad_t           -8.9049e-03  4.6026e-03 -1.9348  0.05442 .
## Anios_de_contrato_t -5.8924e-03  7.4929e-03 -0.7864  0.43256
```

```

## X_Bateos_2_t      -1.6948e-04  1.0509e-04 -1.6126  0.10839
## X_Bateos_2_t_1    -2.2314e-05  7.2848e-05 -0.3063  0.75968
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.33762203  0.15041056  2.2447  0.02588 *
## Edad_t         -0.00989510  0.00462699 -2.1386  0.03368 *
## Anios_de_contrato_t -0.01099017  0.00761516 -1.4432  0.15052
## X_Bateos_t      0.00016107  0.00183610  0.0877  0.93018
## X_Bateos_t_1    -0.00023175  0.00113073 -0.2050  0.83782
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.3847e-01  1.5341e-01  2.2063  0.02850 *
## Edad_t         -9.9280e-03  4.6973e-03 -2.1135  0.03579 *
## Anios_de_contrato_t -1.0773e-02  7.2114e-03 -1.4940  0.13676
## X_Carreras_2_t   3.6095e-05  2.0439e-04  0.1766  0.86000
## X_Carreras_2_t_1 -1.3095e-04  1.0319e-04 -1.2691  0.20589
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.4491e-01  1.6083e-01  2.1445  0.03319 *
## Edad_t         -1.0127e-02  4.9310e-03 -2.0537  0.04130 *
## Anios_de_contrato_t -1.0884e-02  7.3617e-03 -1.4785  0.14083
## X_Carreras_ganadas_2_t  8.1694e-05  2.4924e-04  0.3278  0.74342
## X_Carreras_ganadas_2_t_1 -1.6069e-04  1.2232e-04 -1.3137  0.19046
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.3231248  0.1544134  2.0926  0.03764 *
## Edad_t         -0.0093779  0.0047396 -1.9786  0.04922 *
## Anios_de_contrato_t -0.0095462  0.0076299 -1.2512  0.21233
## X_Carreras_ganadas_t -0.0010216  0.0019720 -0.5181  0.60499
## X_Carreras_ganadas_t_1 -0.0010300  0.0012660 -0.8136  0.41683
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##

```

```

## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.32933842  0.15422380  2.1355  0.03393 *
## Edad_t        -0.00959597  0.00473899 -2.0249  0.04420 *
## Anios_de_contrato_t -0.01024398  0.00771693 -1.3275  0.18586
## X_Carreras_t    -0.00039622  0.00200381 -0.1977  0.84345
## X_Carreras_t_1  -0.00071155  0.00116635 -0.6101  0.54251
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.1809e-01  1.4589e-01  2.1804  0.03039 *
## Edad_t        -9.4298e-03  4.5133e-03 -2.0893  0.03794 *
## Anios_de_contrato_t -9.6350e-03  7.5499e-03 -1.2762  0.20336
## X_Comando_2_t   -1.5016e-03  5.8323e-03 -0.2575  0.79708
## X_Comando_2_t_1  -6.1332e-06  4.4722e-06 -1.3714  0.17178
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.32267706  0.14348783  2.2488  0.02561 *
## Edad_t        -0.00947868  0.00447018 -2.1204  0.03520 *
## Anios_de_contrato_t -0.01059900  0.00825069 -1.2846  0.20040
## X_Comando_t     0.00117385  0.01287826  0.0911  0.92746
## X_Comando_t_1   -0.00067024  0.00060429 -1.1091  0.26870
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.2985930  0.1460008  2.0451  0.042143 *
## Edad_t        -0.0092455  0.0044839 -2.0620  0.040498 *
## Anios_de_contrato_t -0.0099238  0.0076051 -1.3049  0.193422
## X_Control_2_t   -0.0408465  0.0414054 -0.9865  0.325073
## X_Control_2_t_1  -0.1021534  0.0291577 -3.5035  0.000566 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.2818057  0.1427465  1.9742  0.04973 *
## Edad_t        -0.0083812  0.0043841 -1.9118  0.05733 .
## Anios_de_contrato_t -0.0107103  0.0071618 -1.4955  0.13636

```

```

## X_Control_t          0.0419532  0.0289369  1.4498  0.14867
## X_Control_t_1        -0.0705475  0.0308554 -2.2864  0.02327 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.2924522  0.1459587  2.0037  0.04645 *
## Edad_t         -0.0081550  0.0044630 -1.8273  0.06914 .
## Anios_de_contrato_t -0.0114367  0.0074490 -1.5353  0.12628
## X_Dominio_2_t    -0.0022252  0.0191039 -0.1165  0.90739
## X_Dominio_2_t_1   0.0425046  0.0202411  2.0999  0.03698 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.2802284  0.1471345  1.9046  0.058264 .
## Edad_t         -0.0076989  0.0044860 -1.7162  0.087662 .
## Anios_de_contrato_t -0.0121776  0.0076620 -1.5893  0.113554
## X_Dominio_t     -0.0036513  0.0185220 -0.1971  0.843925
## X_Dominio_t_1    0.0454595  0.0172690  2.6324  0.009136 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.30187840  0.15280047  1.9756  0.04956 *
## Edad_t         -0.00922413  0.00465099 -1.9833  0.04870 *
## Anios_de_contrato_t -0.00904158  0.00810528 -1.1155  0.26596
## X_ERA_2_t       -0.00017715  0.00245863 -0.0721  0.94263
## X_ERA_2_t_1     -0.00697848  0.00252028 -2.7689  0.00615 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.3042020  0.1405002  2.1651  0.0315554 *
## Edad_t         -0.0089965  0.0042247 -2.1295  0.0344304 *
## Anios_de_contrato_t -0.0110086  0.0081487 -1.3510  0.1782249
## X_ERA_t         -0.0077904  0.0065757 -1.1847  0.2375241
## X_ERA_t_1       -0.0221982  0.0063767 -3.4811  0.0006124 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##

```

```

## t test of coefficients:
##
##
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.0469e-01  1.4758e-01  2.0645  0.04025 *
## Edad_t           -9.0642e-03  4.5302e-03 -2.0008  0.04675 *
## Anios_de_contrato_t -6.8046e-03  7.3427e-03 -0.9267  0.35519
## X_Inning_pitched_2_t -1.2247e-04  1.0465e-04 -1.1703  0.24329
## X_Inning_pitched_2_t_1 5.6564e-06  6.6609e-05  0.0849  0.93241
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.32927411  0.16185601  2.0344  0.04323 *
## Edad_t           -0.00964062  0.00492223 -1.9586  0.05154 .
## Anios_de_contrato_t -0.01011733  0.00807192 -1.2534  0.21152
## X_Inning_pitched_t -0.00023620  0.00138523 -0.1705  0.86478
## X_Inning_pitched_t_1 -0.00022578  0.00106930 -0.2111  0.83299
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.32258880  0.15543125  2.0754  0.03922 *
## Edad_t           -0.00946119  0.00475540 -1.9896  0.04799 *
## Anios_de_contrato_t -0.01032941  0.00701155 -1.4732  0.14226
## X_Losses_2_t      -0.00165474  0.00191057 -0.8661  0.38747
## X_Losses_2_t_1     -0.00087209  0.00093272 -0.9350  0.35091
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3226550  0.1559452  2.0690  0.03982 *
## Edad_t           -0.0093794  0.0047627 -1.9693  0.05029 .
## Anios_de_contrato_t -0.0097782  0.0071222 -1.3729  0.17131
## X_Losses_t        -0.0043592  0.0060830 -0.7166  0.47444
## X_Losses_t_1      -0.0048717  0.0038481 -1.2660  0.20698
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3577760  0.1552625  2.3043  0.022226 *
## Edad_t           -0.0104653  0.0047287 -2.2131  0.028014 *
## Anios_de_contrato_t -0.0113530  0.0076187 -1.4902  0.137749

```



```

## X_Saves_2_t          0.1122525  0.0340663  3.2951 0.001163 **
## X_Saves_2_t_1        0.0178670  0.0060187  2.9686 0.003355 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.3671102  0.1562702   2.3492 0.019784 *
## Edad_t         -0.0106954  0.0047491  -2.2521 0.025398 *
## Anios_de_contrato_t -0.0117359  0.0076437  -1.5354 0.126266
## X_Saves_t       0.0697317  0.0238760   2.9206 0.003893 **
## X_Saves_t_1     0.0517882  0.0257488   2.0113 0.045630 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.3159e-01  1.4843e-01   2.2340 0.02658 *
## Edad_t         -9.8517e-03  4.5050e-03  -2.1868 0.02991 *
## Anios_de_contrato_t -8.4203e-03  7.8636e-03  -1.0708 0.28555
## X_Strike_outs_2_t -7.8947e-05  9.5638e-05  -0.8255 0.41008
## X_Strike_outs_2_t_1 1.2402e-04  9.5277e-05   1.3017 0.19451
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.5018e-01  1.5643e-01   2.2386 0.02628 *
## Edad_t         -1.0239e-02  4.7692e-03  -2.1468 0.03300 *
## Anios_de_contrato_t -1.2700e-02  7.8640e-03  -1.6150 0.10789
## X_Strike_outs_t   7.9592e-04  1.2645e-03   0.6294 0.52979
## X_Strike_outs_t_1 -7.9708e-05  1.0995e-03  -0.0725 0.94228
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.3337820  0.1427361   2.3385 0.02035 *
## Edad_t         -0.0097946  0.0043775  -2.2375 0.02635 *
## Anios_de_contrato_t -0.0106165  0.0077988  -1.3613 0.17494
## X_WAR_2_t       0.0010295  0.0036974   0.2784 0.78097
## X_WAR_2_t_1     -0.0014703  0.0048375  -0.3039 0.76149
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##

```

```

## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3659734  0.1466387  2.4957  0.01337 *
## Edad_t           -0.0105356  0.0044978 -2.3424  0.02014 *
## Anios_de_contrato_t -0.0140345  0.0082485 -1.7015  0.09040 .
## X_WAR_t           0.0092628  0.0089931  1.0300  0.30426
## X_WAR_t_1         0.0065455  0.0115520  0.5666  0.57161
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2396216  0.1357151  1.7656  0.078977 .
## Edad_t           -0.0072380  0.0040910 -1.7692  0.078369 .
## Anios_de_contrato_t -0.0121413  0.0081662 -1.4868  0.138643
## X_WHIP_2_t        -0.0049168  0.0111271 -0.4419  0.659052
## X_WHIP_2_t_1      -0.0389671  0.0103938 -3.7491  0.000232 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3338546  0.1411883  2.3646  0.019002 *
## Edad_t           -0.0097613  0.0042876 -2.2766  0.023861 *
## Anios_de_contrato_t -0.0124653  0.0079385 -1.5702  0.117935
## X_WHIP_t          -0.0018661  0.0108595 -0.1718  0.863734
## X_WHIP_t_1        -0.0318981  0.0114650 -2.7822  0.005913 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.3146e-01  1.5002e-01  2.2095  0.02827 *
## Edad_t           -9.7283e-03  4.5721e-03 -2.1278  0.03457 *
## Anios_de_contrato_t -1.0262e-02  7.4503e-03 -1.3774  0.16992
## X_Walks_2_t       -1.6036e-04  3.5642e-04 -0.4499  0.65326
## X_Walks_2_t_1      7.3793e-05  2.5866e-04  0.2853  0.77572
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3448499  0.1562061  2.2077  0.02840 *
## Edad_t           -0.0100635  0.0047964 -2.0981  0.03714 *
## Anios_de_contrato_t -0.0119994  0.0077003 -1.5583  0.12074

```

```
## X_Walks_t          0.0010227  0.0023832  0.4291  0.66828
## X_Walks_t_1        -0.0017722  0.0022127 -0.8009  0.42412
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.4189e-01  1.5137e-01  2.2587  0.02498 *
## Edad_t         -9.9748e-03  4.6136e-03 -2.1620  0.03180 *
## Anios_de_contrato_t -1.1643e-02  7.7918e-03 -1.4943  0.13666
## X_Wins_2_t       4.4101e-04  1.2668e-03  0.3481  0.72811
## X_Wins_2_t_1      6.4969e-05  1.1801e-03  0.0551  0.95615
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.31051187  0.16098981  1.9288  0.05517 .
## Edad_t         -0.00916146  0.00491357 -1.8645  0.06371 .
## Anios_de_contrato_t -0.00852631  0.00732951 -1.1633  0.24609
## X_Wins_t        -0.00414118  0.00536014 -0.7726  0.44067
## X_Wins_t_1       0.00097795  0.00400396  0.2442  0.80729
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

First Differences

Bateadores

Se obtendrán las estimaciones de las variables referentes a estadísticas deportivas sin controles

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_hitter_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_h <- paste(vars, stat_hitter_t[[i]],
                        sep = '+')
  formula <- paste(base_vars_h,
                   stat_hitter_t_1[[i]],
                   sep = " + ")

  h_m_first_d <- plm(formula, data = hitter_data,
                     model = "fd",
                     index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(h_m_first_d,
                           vcov = vcovHC(h_m_first_d,
                                           type = "HC1",
                                           cluster = "group"))
```

```
print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.02751827  0.00313969   8.7647 5.137e-16 ***
## Edad_t        -0.01514562  0.00203950  -7.4262 2.432e-12 ***
## Anios_de_contrato_t -0.04715205  0.00860214  -5.4814 1.152e-07 ***
## X_At_bats_t      0.00013341  0.00040004   0.3335  0.7391
## X_At_bats_t_1     0.00127795  0.00029389   4.3484 2.097e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.4658e-02  3.4456e-03   7.1565 1.219e-11 ***
## Edad_t        -1.5522e-02  2.0574e-03  -7.5445 1.186e-12 ***
## Anios_de_contrato_t -4.6687e-02  9.0848e-03  -5.1391 6.085e-07 ***
## X_At_bats_2_t    -1.0404e-05  1.3541e-05  -0.7684  0.4431
## X_At_bats_2_t_1    1.5363e-05  2.6365e-05   0.5827  0.5607
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.02513831  0.00344048   7.3066 4.990e-12 ***
## Edad_t        -0.01546580  0.00204580  -7.5598 1.080e-12 ***
## Anios_de_contrato_t -0.04681006  0.00882700  -5.3031 2.768e-07 ***
## X_Bateos_t     -0.00086677  0.00061252  -1.4151  0.1585
## X_Bateos_t_1     0.00120062  0.00077431   1.5506  0.1224
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.02412992  0.00332950   7.2473 7.112e-12 ***
## Edad_t        -0.01591748  0.00195224  -8.1535 2.676e-14 ***
## Anios_de_contrato_t -0.04399845  0.00855968  -5.1402 6.052e-07 ***
## X_Bateos_2_t    -0.00013328  0.00005576  -2.3902  0.01768 *
## X_Bateos_2_t_1   -0.00018925  0.00011710  -1.6161  0.10751
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
```

```

##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.0242361  0.0032136  7.5418 1.206e-12 ***
## Edad_t           -0.0158611  0.0019721 -8.0426 5.397e-14 ***
## Anios_de_contrato_t -0.0450374  0.0085415 -5.2728 3.205e-07 ***
## X_Bateos_promedio_t -0.0062845  0.0126397 -0.4972  0.6195
## X_Bateos_promedio_t_1 0.0353089  0.0088100  4.0078 8.391e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.0245374  0.0031951  7.6796 5.185e-13 ***
## Edad_t           -0.0153858  0.0020690 -7.4363 2.288e-12 ***
## Anios_de_contrato_t -0.0452477  0.0085098 -5.3171 2.585e-07 ***
## X_Bateos_promedio_2_t -0.0206948  0.0225871 -0.9162  0.360553
## X_Bateos_promedio_2_t_1 0.0257302  0.0080874  3.1815 0.001677 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.02332082  0.00270258  8.6291 1.249e-15 ***
## Edad_t           -0.01524369  0.00197728 -7.7094 4.315e-13 ***
## Anios_de_contrato_t -0.04600542  0.00857412 -5.3656 2.040e-07 ***
## X_Dobles_t        -0.00178185  0.00204248 -0.8724  0.3839
## X_Dobles_t_1       -0.00032019  0.00167593 -0.1911  0.8487
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.02359044  0.00351427  6.7128 1.601e-10 ***
## Edad_t           -0.01552629  0.00204133 -7.6060 8.148e-13 ***
## Anios_de_contrato_t -0.04610428  0.00890787 -5.1757 5.111e-07 ***
## X_Dobles_2_t       0.00012929  0.00036713  0.3522  0.7251
## X_Dobles_2_t_1     -0.00040568  0.00032204 -1.2597  0.2091
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.0243501  0.0037544  6.4858 5.743e-10 ***
## Edad_t           -0.0155400  0.0019578 -7.9377 1.044e-13 ***
## Anios_de_contrato_t -0.0490134  0.0093910 -5.2192 4.150e-07 ***
## X_Home_runs_t     0.0071848  0.0038967  1.8438  0.06655 .

```

```

## X_Home_runs_t_1      0.0017885  0.0023513  0.7606   0.44768
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.02296936  0.00371654  6.1803 3.066e-09 ***
## Edad_t        -0.01550304  0.00198412 -7.8136 2.265e-13 ***
## Anios_de_contrato_t -0.04997127  0.00946492 -5.2796 3.101e-07 ***
## X_Home_runs_2_t    0.00128060  0.00047027  2.7231 0.006986 **
## X_Home_runs_2_t_1  0.00038505  0.00033171  1.1608 0.246990
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.6904e-02  3.3743e-03  7.9732 8.357e-14 ***
## Edad_t        -1.5273e-02  2.0433e-03 -7.4746 1.814e-12 ***
## Anios_de_contrato_t -4.7661e-02  8.7929e-03 -5.4204 1.558e-07 ***
## X_Juegos_iniciados_t  2.7268e-05  7.3835e-04  0.0369 0.9705733
## X_Juegos_iniciados_t_1 2.3877e-03  6.8870e-04  3.4670 0.0006328 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.5233e-02  3.5152e-03  7.1783 1.071e-11 ***
## Edad_t        -1.5430e-02  2.0572e-03 -7.5005 1.550e-12 ***
## Anios_de_contrato_t -4.6673e-02  8.9272e-03 -5.2282 3.974e-07 ***
## X_Juegos_iniciados_2_t  1.8039e-05  5.6602e-05  0.3187 0.7503
## X_Juegos_iniciados_2_t_1 8.2501e-05  8.7100e-05  0.9472 0.3446
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.0242862  0.0031446  7.7231 3.965e-13
## Edad_t        -0.0157378  0.0019613 -8.0242 6.063e-14
## Anios_de_contrato_t -0.0457288  0.0086189 -5.3056 2.733e-07
## X_Porcentaje_On_base_plus_slugging_t -0.0073311  0.0090061 -0.8140 0.41652
## X_Porcentaje_On_base_plus_slugging_t_1 0.0125865  0.0064549  1.9499 0.05246
##
## (Intercept) ***
## Edad_t ***
## Anios_de_contrato_t ***
## X_Porcentaje_On_base_plus_slugging_t

```

```

## X_Porcentaje_On_base_plus_slugging_t_1 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
##               Estimate Std. Error t value
## (Intercept)      0.0250970  0.0034975  7.1757
## Edad_t           -0.0155027  0.0020105 -7.7110
## Anios_de_contrato_t -0.0436897  0.0089108 -4.9030
## X_Porcentaje_On_base_plus_slugging_2_t -0.0221582  0.0085037 -2.6057
## X_Porcentaje_On_base_plus_slugging_2_t_1 -0.0050022  0.0061710 -0.8106
##
##               Pr(>|t|)
## (Intercept)      1.088e-11 ***
## Edad_t           4.273e-13 ***
## Anios_de_contrato_t 1.833e-06 ***
## X_Porcentaje_On_base_plus_slugging_2_t  0.009794 **
## X_Porcentaje_On_base_plus_slugging_2_t_1 0.418471
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.0249003  0.0033755  7.3768 3.275e-12 ***
## Edad_t           -0.0158372  0.0019286 -8.2117 1.847e-14 ***
## Anios_de_contrato_t -0.0462687  0.0083658 -5.5307 9.009e-08 ***
## X_Porcentaje_on_base_t  0.0153801  0.0230159  0.6682 0.5046823
## X_Porcentaje_on_base_t_1 0.0496549  0.0144825  3.4286 0.0007242 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.0246038  0.0033476  7.3498 3.853e-12 ***
## Edad_t           -0.0161188  0.0018948 -8.5067 2.771e-15 ***
## Anios_de_contrato_t -0.0469221  0.0087474 -5.3641 2.055e-07 ***
## X_Porcentaje_on_base_2_t  0.0448017  0.0273463  1.6383 0.102787
## X_Porcentaje_on_base_2_t_1 0.0299704  0.0101426  2.9549 0.003468 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.0234594  0.0033864  6.9276 4.659e-11 ***
## Edad_t           -0.0155063  0.0020664 -7.5040 1.518e-12 ***
## Anios_de_contrato_t -0.0452170  0.0089620 -5.0454 9.465e-07 ***
## X_Porcentaje_slugging_t -0.0102317  0.0118758 -0.8616 0.3899

```

```

## X_Porcentaje_slugging_t_1 -0.0076779 0.0152460 -0.5036 0.6150
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.0235577 0.0035413 6.6523 2.256e-10 ***
## Edad_t -0.0157971 0.0020855 -7.5749 9.855e-13 ***
## Anios_de_contrato_t -0.0450760 0.0089349 -5.0449 9.487e-07 ***
## X_Porcentaje_slugging_2_t -0.0203647 0.0148860 -1.3680 0.1727
## X_Porcentaje_slugging_2_t_1 -0.0225076 0.0142408 -1.5805 0.1154
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.0257149 0.0034126 7.5352 1.255e-12 ***
## Edad_t -0.0156501 0.0020041 -7.8090 2.330e-13 ***
## Anios_de_contrato_t -0.0480045 0.0093029 -5.1601 5.504e-07 ***
## X_Runs_batted_in_t 0.0012171 0.0011298 1.0773 0.2825
## X_Runs_batted_in_t_1 0.0019998 0.0012865 1.5545 0.1215
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.02306317 0.00358421 6.4347 7.630e-10 ***
## Edad_t -0.01591952 0.00194979 -8.1647 2.491e-14 ***
## Anios_de_contrato_t -0.04658702 0.00898483 -5.1851 4.887e-07 ***
## X_Runs_batted_in_2_t 0.00026550 0.00027420 0.9683 0.334
## X_Runs_batted_in_2_t_1 -0.00012611 0.00014305 -0.8816 0.379
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.0254327 0.0032587 7.8045 2.396e-13 ***
## Edad_t -0.0138059 0.0020585 -6.7067 1.657e-10 ***
## Anios_de_contrato_t -0.0465307 0.0087470 -5.3196 2.553e-07 ***
## X_Triples_t -0.0293045 0.0067248 -4.3577 2.017e-05 ***
## X_Triples_t_1 0.0065404 0.0096191 0.6799 0.4973
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:

```



```
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.0258704  0.0034243  7.5549 1.113e-12 ***
## Edad_t           -0.0153741  0.0020041 -7.6714 5.454e-13 ***
## Anios_de_contrato_t -0.0451879  0.0087004 -5.1938 4.688e-07 ***
## X_Triples_2_t     -0.0027505  0.0027662 -0.9943  0.32117
## X_Triples_2_t_1    0.0039831  0.0016385  2.4309  0.01586 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.0226191  0.0033819  6.6882 1.840e-10 ***
## Edad_t           -0.0176080  0.0019991 -8.8082 3.857e-16 ***
## Anios_de_contrato_t -0.0520408  0.0086929 -5.9866 8.627e-09 ***
## X_WAR_t           0.0288740  0.0034609  8.3430 7.974e-15 ***
## X_WAR_t_1         0.0049307  0.0052800  0.9338  0.3514
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.02108410  0.00341154  6.1802 3.067e-09 ***
## Edad_t           -0.01572539  0.00189062 -8.3176 9.385e-15 ***
## Anios_de_contrato_t -0.05064179  0.00905495 -5.5927 6.596e-08 ***
## X_WAR_2_t         0.01342330  0.00376244  3.5677 0.0004419 ***
## X_WAR_2_t_1       -0.00057167  0.00119198 -0.4796 0.6319919
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Starting pitcher

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_fielder_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_s <- paste(vars, stat_fielder_t[[i]],
                        sep = '+')
  formula <- paste(base_vars_s,
                   stat_fielder_t_1[[i]],
                   sep = " + ")

  s_m_first_d <- plm(formula, data = starting_data,
                     model = "fd",
                     index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(s_m_first_d,
                           vcov = vcovHC(s_m_first_d,
                                           type = "HC1",
```

```
cluster = "group"))

print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -7.7605e-03  1.4459e-02 -0.5367   0.5929
## Edad_t         -1.3251e-02  1.4423e-02 -0.9187   0.3609
## Anios_de_contrato_t -1.9394e-02  9.9979e-03 -1.9398   0.0558 .
## X_Bateos_2_t     -3.2869e-04  5.9750e-05 -5.5011 4.091e-07 ***
## X_Bateos_2_t_1     2.2558e-05  6.7819e-05  0.3326   0.7403
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.00209682  0.01270502 -0.1650   0.8693
## Edad_t         -0.01322895  0.01240158 -1.0667   0.2892
## Anios_de_contrato_t -0.04051494  0.00642738 -6.3035 1.335e-08 ***
## X_Bateos_t       0.00221041  0.00145418  1.5200   0.1323
## X_Bateos_t_1     0.00048365  0.00063774  0.7584   0.4504
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.00753851  0.01523756 -0.4947 0.6220964
## Edad_t         -0.01282857  0.01396069 -0.9189 0.3608070
## Anios_de_contrato_t -0.03204580  0.00851070 -3.7654 0.0003095 ***
## X_Carreras_2_t   -0.00024541  0.00017588 -1.3953 0.1666340
## X_Carreras_2_t_1  0.00002769  0.00010204  0.2714 0.7867876
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -1.0428e-02  1.5514e-02 -0.6722 0.5033213
## Edad_t         -9.6307e-03  1.4670e-02 -0.6565 0.5133209
## Anios_de_contrato_t -2.9075e-02  8.0704e-03 -3.6026 0.0005356 ***
## X_Carreras_ganadas_2_t -4.9441e-04  1.9457e-04 -2.5410 0.0129153 *
## X_Carreras_ganadas_2_t_1 -5.7036e-05  1.1240e-04 -0.5074 0.6131901
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```

##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0033198  0.0143376 -0.2315 0.817462
## Edad_t         -0.0107545  0.0137299 -0.7833 0.435683
## Anios_de_contrato_t -0.0310957  0.0094401 -3.2940 0.001453 **
## X_Carreras_ganadas_t -0.0016455  0.0011274 -1.4595 0.148202
## X_Carreras_ganadas_t_1 0.0034831  0.0010872  3.2037 0.001926 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.00360849  0.01457399 -0.2476 0.8050570
## Edad_t         -0.01099437  0.01357911 -0.8097 0.4204544
## Anios_de_contrato_t -0.03330972  0.00933694 -3.5675 0.0006017 ***
## X_Carreras_t    -0.00063602  0.00110856 -0.5737 0.5676991
## X_Carreras_t_1   0.00335561  0.00115662  2.9012 0.0047577 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -5.8164e-03  1.6367e-02 -0.3554 0.7232079
## Edad_t         -1.3207e-02  1.5062e-02 -0.8769 0.3830965
## Anios_de_contrato_t -3.5134e-02  9.8696e-03 -3.5598 0.0006172 ***
## X_Comando_2_t    6.2374e-04  3.6936e-03  0.1689 0.8663093
## X_Comando_2_t_1  6.1225e-06  1.3969e-06  4.3828 3.405e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.00456522  0.01465722 -0.3115 0.7562279
## Edad_t         -0.01325630  0.01339638 -0.9895 0.3252733
## Anios_de_contrato_t -0.04015550  0.00894327 -4.4900 2.278e-05 ***
## X_Comando_t     0.02243640  0.00894276  2.5089 0.0140563 *
## X_Comando_t_1    0.00066965  0.00018752  3.5710 0.0005948 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0056489  0.0156122 -0.3618 0.7184004
## Edad_t         -0.0121247  0.0137552 -0.8815 0.3806132

```

```

## Anios_de_contrato_t -0.0318802  0.0095516 -3.3377 0.0012662 **
## X_Control_2_t      -0.0423105  0.0148307 -2.8529 0.0054671 **
## X_Control_2_t_1    -0.0189928  0.0054059 -3.5133 0.0007191 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.0046339  0.0151948 -0.3050 0.7611532
## Edad_t        -0.0116051  0.0135206 -0.8583 0.3931841
## Anios_de_contrato_t -0.0343315  0.0096640 -3.5525 0.0006323 ***
## X_Control_t    0.0360902  0.0363728  0.9922 0.3239695
## X_Control_t_1  -0.0514588  0.0157884 -3.2593 0.0016202 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.0051099  0.0151908 -0.3364 0.7374331
## Edad_t        -0.0130094  0.0137239 -0.9479 0.3459125
## Anios_de_contrato_t -0.0339335  0.0097736 -3.4720 0.0008229 ***
## X_Dominio_2_t  0.0022999  0.0044755  0.5139 0.6087034
## X_Dominio_2_t_1  0.0031073  0.0038001  0.8177 0.4158761
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.0017719  0.0160089 -0.1107  0.9121
## Edad_t        -0.0154455  0.0142324 -1.0852  0.2810
## Anios_de_contrato_t -0.0411001  0.0099192 -4.1435 8.195e-05 ***
## X_Dominio_t    0.0447216  0.0084053  5.3206 8.614e-07 ***
## X_Dominio_t_1  0.0103462  0.0068844  1.5029  0.1367
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.0030989  0.0145269 -0.2133 0.831601
## Edad_t        -0.0108190  0.0139194 -0.7773 0.439214
## Anios_de_contrato_t -0.0298622  0.0109011 -2.7394 0.007533 **
## X_ERA_2_t      0.0020651  0.0023643  0.8735 0.384926
## X_ERA_2_t_1    -0.0028719  0.0025962 -1.1062 0.271849
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##

```

```

##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0019907  0.0141856 -0.1403  0.888738
## Edad_t         -0.0100395  0.0132317 -0.7587  0.450154
## Anios_de_contrato_t -0.0337730  0.0115004 -2.9367  0.004292 **
## X_ERA_t        -0.0014271  0.0092492 -0.1543  0.877751
## X_ERA_t_1      -0.0218071  0.0046717 -4.6679  1.156e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -7.6838e-03  1.4641e-02 -0.5248  0.6011043
## Edad_t         -1.1450e-02  1.4386e-02 -0.7959  0.4283555
## Anios_de_contrato_t -2.3397e-02  9.6396e-03 -2.4272  0.0173797 *
## X_Inning_pitched_2_t -2.2698e-04  5.8903e-05 -3.8534  0.0002287 ***
## X_Inning_pitched_2_t_1 1.5460e-05  6.1542e-05  0.2512  0.8022718
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.00233341  0.01394557 -0.1673  0.86752
## Edad_t         -0.01136438  0.01397979 -0.8129  0.41859
## Anios_de_contrato_t -0.02753352  0.01086839 -2.5334  0.01318 *
## X_Inning_pitched_t -0.00173073  0.00072002 -2.4037  0.01846 *
## X_Inning_pitched_t_1 0.00139610  0.00090876  1.5363  0.12828
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.00892902  0.01574397 -0.5671  0.5721504
## Edad_t         -0.01371624  0.01353057 -1.0137  0.3136611
## Anios_de_contrato_t -0.03108171  0.00881723 -3.5251  0.0006919 ***
## X_Losses_2_t    -0.00382084  0.00201516 -1.8960  0.0614335 .
## X_Losses_2_t_1  -0.00006815  0.00071353 -0.0955  0.9241388
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.00863860  0.01611460 -0.5361  0.593342
## Edad_t         -0.01126059  0.01445728 -0.7789  0.438261

```

```

## Anios_de_contrato_t -0.02918987  0.00894190 -3.2644 0.001595 **
## X_Losses_t          -0.00801790  0.00544151 -1.4735 0.144407
## X_Losses_t_1        -0.00075931  0.00308189 -0.2464 0.805998
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.00557021  0.01522853 -0.3658 0.7154638
## Edad_t         -0.01272668  0.01397895 -0.9104 0.3652386
## Anios_de_contrato_t -0.03367916  0.00959577 -3.5098 0.0007275 ***
## X_Saves_2_t      0.10218863  0.00127355 80.2389 < 2.2e-16 ***
## X_Saves_2_t_1    -0.00059684  0.00828547 -0.0720 0.9427474
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0062514  0.0153748 -0.4066 0.6853465
## Edad_t         -0.0116088  0.0141725 -0.8191 0.4150686
## Anios_de_contrato_t -0.0333930  0.0094565 -3.5312 0.0006781 ***
## X_Saves_t       0.0788230  0.0079359  9.9325 8.966e-16 ***
## X_Saves_t_1     -0.0447804  0.0301469 -1.4854 0.1412247
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -1.7513e-03  1.4978e-02 -0.1169 0.907199
## Edad_t         -1.3034e-02  1.3983e-02 -0.9322 0.353962
## Anios_de_contrato_t -3.2138e-02  1.1289e-02 -2.8469 0.005562 **
## X_Strike_outs_2_t -1.0980e-04  3.9281e-05 -2.7952 0.006442 **
## X_Strike_outs_2_t_1 1.9634e-04  7.8683e-05  2.4954 0.014563 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.00387170  0.01450979 -0.2668 0.7902593
## Edad_t         -0.01238688  0.01406974 -0.8804 0.3811895
## Anios_de_contrato_t -0.03952048  0.01019440 -3.8767 0.0002109 ***
## X_Strike_outs_t  0.00106001  0.00045842  2.3123 0.0232383 *
## X_Strike_outs_t_1 0.00130229  0.00078855  1.6515 0.1024135
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##

```

```

##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0063245  0.0145013  -0.4361 0.663873
## Edad_t         -0.0117966  0.0135487  -0.8707 0.386441
## Anios_de_contrato_t -0.0272793  0.0105681  -2.5813 0.011601 *
## X_WAR_2_t       -0.0031079  0.0017876  -1.7386 0.085815 .
## X_WAR_2_t_1     -0.0041278  0.0012253  -3.3689 0.001146 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0046654  0.0141514  -0.3297 0.742474
## Edad_t         -0.0117884  0.0145704  -0.8091 0.420790
## Anios_de_contrato_t -0.0327878  0.0107858  -3.0399 0.003165 **
## X_WAR_t         -0.0057051  0.0055264  -1.0323 0.304910
## X_WAR_t_1       0.0035122  0.0078556   0.4471 0.655968
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)     0.0014054  0.0156861   0.0896 0.928827
## Edad_t          -0.0107051  0.0133482  -0.8020 0.424850
## Anios_de_contrato_t -0.0314983  0.0097937  -3.2162 0.001852 **
## X_WHIP_2_t       0.0053952  0.0029259   1.8440 0.068756 .
## X_WHIP_2_t_1     -0.0201289  0.0068780  -2.9265 0.004421 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)     0.0029486  0.0123435   0.2389 0.8117861
## Edad_t          -0.0121175  0.0130024  -0.9319 0.3540713
## Anios_de_contrato_t -0.0351042  0.0087670  -4.0042 0.0001349 ***
## X_WHIP_t         -0.0014367  0.0068112  -0.2109 0.8334564
## X_WHIP_t_1       -0.0326618  0.0130991  -2.4934 0.0146377 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.00303362  0.01491846  -0.2033 0.839362
## Edad_t         -0.01199040  0.01343103  -0.8927 0.374578

```

```

## Anios_de_contrato_t -0.03236308  0.00962819 -3.3613 0.001175 **
## X_Walks_2_t         -0.00022633  0.00024433 -0.9263 0.356975
## X_Walks_2_t_1       0.00054416  0.00019745  2.7559 0.007194 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0036185  0.0145235 -0.2491 0.8038637
## Edad_t         -0.0106854  0.0138546 -0.7713 0.4427478
## Anios_de_contrato_t -0.0244974  0.0100444 -2.4389 0.0168639 *
## X_Walks_t       -0.0049643  0.0013557 -3.6618 0.0004396 ***
## X_Walks_t_1     0.0032336  0.0016081  2.0108 0.0475964 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.00633191  0.01511660 -0.4189 0.67639
## Edad_t         -0.01239545  0.01531155 -0.8095 0.42051
## Anios_de_contrato_t -0.03121681  0.01225343 -2.5476 0.01269 *
## X_Wins_2_t      -0.00063294  0.00109893 -0.5760 0.56620
## X_Wins_2_t_1    -0.00025915  0.00085600 -0.3027 0.76284
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0072655  0.0147963 -0.4910 0.624696
## Edad_t         -0.0088184  0.0146122 -0.6035 0.547823
## Anios_de_contrato_t -0.0223024  0.0114529 -1.9473 0.054879 .
## X_Wins_t       -0.0107444  0.0040167 -2.6750 0.009001 **
## X_Wins_t_1     0.0031698  0.0034350  0.9228 0.358790
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

PCA - Estimación directa

Lo que haremos ahora es obtener los estimadores con los componentes principales obtenidos en el tratamiento de los paneles, lo cuales ya son el número óptimo de componentes.

Pooling

Bateadores

```
# run linear regression with grouped errors by country and robust errors
pca_vars <- 'pca1_t + pca1_t_1'
formula <- paste(vars,
                 pca_vars,
                 sep = " + ")

h_m_pooled_pca <- plm(formula, data = hitter_data,
                      model = "pooling",
                      index = c("id", "Anio_ref"))

my_lm_cluster <- coeftest(h_m_pooled_pca,
                         vcov = vcovHC(h_m_pooled_pca,
                                       type = "HC1",
                                       cluster = "group"))

print(my_lm_cluster)
```

```
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   1.7003e-01  7.8107e-02  2.1769  0.02993 *
## Edad_t        -5.9063e-03  2.5040e-03 -2.3588  0.01869 *
## Anios_de_contrato_t -6.1391e-04  3.9092e-03 -0.1570  0.87527
## pca1_t         1.7186e-05  3.4571e-05  0.4971  0.61931
## pca1_t_1       -1.4572e-06  2.4360e-05 -0.0598  0.95232
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Starting pitcher

```
# run linear regression with grouped errors by country and robust errors
pca_vars <- 'pca1_t + pca2_t + pca1_t_1 + pca2_t_1'
formula <- paste(vars,
                 pca_vars,
                 sep = " + ")

s_m_pooled_pca <- plm(formula, data = starting_data,
                      model = "pooling",
                      index = c("id", "Anio_ref"))

my_lm_cluster <- coeftest(s_m_pooled_pca,
                         vcov = vcovHC(s_m_pooled_pca,
                                       type = "HC1",
                                       cluster = "group"))

print(my_lm_cluster)
```

```
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.4228e-01  1.4088e-01  1.7197  0.08704 .
## Edad_t         -6.8581e-03  3.5930e-03 -1.9087  0.05773 .
## Anios_de_contrato_t -5.5920e-03  7.3006e-03 -0.7660  0.44461
## pca1_t         -1.0431e-03  6.3402e-03 -0.1645  0.86948
## pca2_t         -8.5466e-05  7.0724e-05 -1.2085  0.22831
## pca1_t_1        8.7812e-06  5.8339e-06  1.5052  0.13386
## pca2_t_1       -7.2313e-06  4.9638e-05 -0.1457  0.88432
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Efectos fijos

Bateadores

```
# run linear regression with grouped errors by country and robust errors
pca_vars <- 'pca1_t + pca1_t_1'
formula <- paste(vars,
                 pca_vars,
                 sep = " + ")

h_m_fix_ef_pca <- plm(formula, data = hitter_data,
                     model = "within",
                     index = c("id", "Anio_ref"))

my_lm_cluster <- coeftest(h_m_fix_ef_pca,
                        vcov = vcovHC(h_m_fix_ef_pca,
                                     type = "HC1",
                                     cluster = "group"))

print(my_lm_cluster)
```

```
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t         -3.6880e-03  5.5746e-03 -0.6616  0.50894
## Anios_de_contrato_t -3.1930e-02  1.2703e-02 -2.5135  0.01267 *
## pca1_t         -5.3890e-06  3.6589e-05 -0.1473  0.88304
## pca1_t_1       -1.2888e-06  3.6768e-05 -0.0351  0.97207
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Starting pitcher

```
# run linear regression with grouped errors by country and robust errors
pca_vars <- 'pca1_t + pca2_t + pca1_t_1 + pca2_t_1'
```

```

formula <- paste(vars,
                 pca_vars,
                 sep = " + ")

s_m_fix_ef_pca <- plm(formula, data = starting_data,
                      model = "within",
                      index = c("id", "Anio_ref"))

my_lm_cluster <- coeftest(s_m_fix_ef_pca,
                          vcov = vcovHC(s_m_fix_ef_pca,
                                         type = "HC1",
                                         cluster = "group"))

print(my_lm_cluster)

```

```

##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -2.6776e-02  1.5298e-02 -1.7504  0.0838 .
## Anios_de_contrato_t -2.0205e-02  1.9612e-02 -1.0302  0.3059
## pca1_t           -1.1191e-02  8.1657e-03 -1.3704  0.1743
## pca2_t           -5.1248e-05  9.9368e-05 -0.5157  0.6074
## pca1_t_1          -3.9805e-06  3.4422e-06 -1.1564  0.2509
## pca2_t_1           2.4602e-05  6.7233e-05  0.3659  0.7154
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

Efectos aleatorios

Bateadores

```

# run linear regression with grouped errors by country and robust errors
pca_vars <- 'pca1_t + pca1_t_1'
formula <- paste(vars,
                 pca_vars,
                 sep = " + ")

h_m_random_pca <- plm(formula, data = hitter_data,
                      model = "fd",
                      index = c("id", "Anio_ref"))

my_lm_cluster <- coeftest(h_m_random_pca,
                          vcov = vcovHC(h_m_random_pca,
                                         type = "HC1",
                                         cluster = "group"))

print(my_lm_cluster)

```

```

##
## t test of coefficients:

```

```
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.4561e-02  3.4495e-03  7.1201 1.511e-11 ***
## Edad_t          -1.5540e-02  2.0537e-03 -7.5668 1.035e-12 ***
## Anios_de_contrato_t -4.6554e-02  9.0358e-03 -5.1521 5.719e-07 ***
## pca1_t           9.9223e-06  1.2571e-05  0.7893  0.4308
## pca1_t_1        -1.2339e-05  2.4243e-05 -0.5090  0.6113
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Starting pitcher

```
# run linear regression with grouped errors by country and robust errors
pca_vars <- 'pca1_t + pca2_t + pca1_t_1 + pca2_t_1'
formula <- paste(vars,
                 pca_vars,
                 sep = " + ")

s_m_random_pca <- plm(formula, data = starting_data,
                      model = "random",
                      index = c("id", "Anio_ref"))

my_lm_cluster <- coeftest(s_m_random_pca,
                         vcov = vcovHC(s_m_random_pca,
                                       type = "HC1",
                                       cluster = "group"))

print(my_lm_cluster)
```

```
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.0790e-01  1.7364e-01  1.7733 0.07771 .
## Edad_t          -8.5976e-03  4.5005e-03 -1.9104 0.05753 .
## Anios_de_contrato_t -5.2323e-03  7.4602e-03 -0.7014 0.48390
## pca1_t          -1.9621e-03  5.8670e-03 -0.3344 0.73840
## pca2_t          -8.3568e-05  6.8230e-05 -1.2248 0.22210
## pca1_t_1         6.3975e-06  4.9219e-06  1.2998 0.19518
## pca2_t_1        -1.3391e-05  4.4824e-05 -0.2988 0.76544
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

First Differences

Bateadores

```
# run linear regression with grouped errors by country and robust errors
pca_vars <- 'pca1_t+ pca1_t_1'
formula <- paste(vars,
```

```

      pca_vars,
      sep = " + ")

h_m_first_d_pca <- plm(formula, data = hitter_data,
      model = "fd",
      index = c("id", "Anio_ref"))

my_lm_cluster <- coeftest(h_m_first_d_pca,
      vcov = vcovHC(h_m_first_d_pca,
        type = "HC1",
        cluster = "group"))

print(my_lm_cluster)

```

```

##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.4561e-02  3.4495e-03  7.1201 1.511e-11 ***
## Edad_t        -1.5540e-02  2.0537e-03 -7.5668 1.035e-12 ***
## Anios_de_contrato_t -4.6554e-02  9.0358e-03 -5.1521 5.719e-07 ***
## pca1_t          9.9223e-06  1.2571e-05  0.7893  0.4308
## pca1_t_1       -1.2339e-05  2.4243e-05 -0.5090  0.6113
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

Starting pitcher

```

# run linear regression with grouped errors by country and robust errors
pca_vars <- 'pca1_t + pca2_t + pca1_t_1 + pca2_t_1'
formula <- paste(vars,
      pca_vars,
      sep = " + ")

s_m_first_d_pca <- plm(formula, data = starting_data,
      model = "fd",
      index = c("id", "Anio_ref"))

my_lm_cluster <- coeftest(s_m_first_d_pca,
      vcov = vcovHC(s_m_first_d_pca,
        type = "HC1",
        cluster = "group"))

print(my_lm_cluster)

```

```

##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -6.7711e-03  1.5567e-02 -0.4350 0.6647509
## Edad_t        -1.0223e-02  1.5686e-02 -0.6517 0.5164088

```

```
## Anios_de_contrato_t -2.3194e-02  1.0240e-02 -2.2651 0.0261767 *
## pca1_t             1.3661e-03  3.5648e-03  0.3832 0.7025550
## pca2_t            -1.5755e-04  4.2092e-05 -3.7430 0.0003386 ***
## pca1_t_1          -2.1815e-06  1.9273e-06 -1.1319 0.2610086
## pca2_t_1          -5.0513e-05  3.8112e-05 -1.3254 0.1887641
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Comparación entre periodos

Obtendremos los estimadores para los primeros dos años de observación para luego compararlos con los estimadores para el resto de años. Primero, aseguremos que los paneles estén ordenados por nombre y año de referencia

```
# Sort dataframe by player name and year_ref
hitter_data <- hitter_data %>% arrange(Jugador, Anio_ref)
# Sort dataframe by player name and year_ref
starting_data <- starting_data %>% arrange(Jugador, Anio_ref)
```

Haremos las estimaciones con todos los modelos para obtener un análisis robusto

Primeros dos años

Pooling

Bateadores

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_hitter_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_h <- paste(vars, stat_hitter_t[[i]],
                        sep = '+')
  formula <- paste(base_vars_h,
                   stat_hitter_t_1[[i]],
                   sep = " + ")

  h_m_pooled_i <- plm(formula, data = hitter_first_two,
                      model = "pooling",
                      index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(h_m_pooled_i,
                           vcov = vcovHC(h_m_pooled_i,
                                           type = "HC1",
                                           cluster = "group"))

  print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
```

```

##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.2818e-01  1.4200e-01  2.3111  0.02161 *
## Edad_t          -1.1356e-02  4.5936e-03 -2.4721  0.01407 *
## Anios_de_contrato_t  7.8379e-05  1.0201e-02  0.0077  0.99388
## X_At_bats_t      -1.4669e-03  1.0265e-03 -1.4290  0.15421
## X_At_bats_t_1     -8.3343e-04  9.9423e-04 -0.8383  0.40265
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.1965e-01  1.4215e-01  2.2487  0.02537 *
## Edad_t          -1.1160e-02  4.5929e-03 -2.4298  0.01578 *
## Anios_de_contrato_t -2.4061e-03  1.0194e-02 -0.2360  0.81359
## X_At_bats_2_t      -6.4663e-05  6.6370e-05 -0.9743  0.33082
## X_At_bats_2_t_1    -1.2869e-06  4.0557e-05 -0.0317  0.97471
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.32124104  0.14117342  2.2755  0.02369 *
## Edad_t          -0.01118743  0.00455587 -2.4556  0.01472 *
## Anios_de_contrato_t -0.00078902  0.00989399 -0.0797  0.93650
## X_Bateos_t       -0.00419794  0.00208472 -2.0137  0.04507 *
## X_Bateos_t_1      0.00051500  0.00153525  0.3354  0.73756
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.30655205  0.14866004  2.0621  0.04019 *
## Edad_t          -0.01078432  0.00473450 -2.2778  0.02355 *
## Anios_de_contrato_t -0.00108815  0.01053790 -0.1033  0.91784
## X_Bateos_2_t      -0.00030370  0.00021506 -1.4122  0.15909
## X_Bateos_2_t_1      0.00020676  0.00015503  1.3336  0.18348
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3013181  0.1508798  1.9971  0.04686 *
## Edad_t          -0.0105979  0.0048608 -2.1803  0.03013 *
## Anios_de_contrato_t -0.0027176  0.0098760 -0.2752  0.78340
## X_Bateos_promedio_t -0.0371876  0.0324692 -1.1453  0.25313

```

```

## X_Bateos_promedio_t_1 0.0222161 0.0328519 0.6763 0.49948
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3026991  0.1511461  2.0027  0.04624 *
## Edad_t           -0.0105995  0.0048906 -2.1673  0.03111 *
## Anios_de_contrato_t -0.0039421  0.0096032 -0.4105  0.68177
## X_Bateos_promedio_2_t -0.0538625  0.0403810 -1.3339  0.18341
## X_Bateos_promedio_2_t_1 0.0295443  0.0301781  0.9790  0.32849
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.31780530  0.13771489  2.3077  0.02180 *
## Edad_t           -0.01122433  0.00446785 -2.5122  0.01260 *
## Anios_de_contrato_t -0.00028744  0.01056252 -0.0272  0.97831
## X_Dobles_t        -0.00936202  0.00461223 -2.0298  0.04339 *
## X_Dobles_t_1      -0.00294884  0.00382170 -0.7716  0.44105
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.29863218  0.14087599  2.1198  0.03496 *
## Edad_t           -0.01056310  0.00451832 -2.3378  0.02015 *
## Anios_de_contrato_t -0.00069393  0.01059271 -0.0655  0.94782
## X_Dobles_2_t      -0.00121986  0.00096377 -1.2657  0.20675
## X_Dobles_2_t_1     0.00093201  0.00072282  1.2894  0.19840
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3215707  0.1431597  2.2462  0.02553 *
## Edad_t           -0.0111418  0.0046766 -2.3825  0.01791 *
## Anios_de_contrato_t -0.0036719  0.0097109 -0.3781  0.70565
## X_Home_runs_t     -0.0029512  0.0061036 -0.4835  0.62914
## X_Home_runs_t_1    0.0027961  0.0036119  0.7742  0.43954
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:

```



```

##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.32504414  0.14328299  2.2685  0.02411 *
## Edad_t           -0.01126909  0.00464712 -2.4250  0.01599 *
## Anios_de_contrato_t -0.00393490  0.00985278 -0.3994  0.68995
## X_Home_runs_2_t    -0.00082763  0.00125468 -0.6596  0.51007
## X_Home_runs_2_t_1   0.00037629  0.00064303  0.5852  0.55893
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3310214  0.1412295  2.3439  0.01984 *
## Edad_t           -0.0114809  0.0045806 -2.5064  0.01280 *
## Anios_de_contrato_t -0.0006067  0.0100984 -0.0601  0.95214
## X_Juegos_iniciados_t -0.0032405  0.0018567 -1.7453  0.08211 .
## X_Juegos_iniciados_t_1 -0.0015147  0.0019079 -0.7939  0.42797
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.1940e-01  1.3946e-01  2.2902  0.02281 *
## Edad_t           -1.1074e-02  4.5124e-03 -2.4542  0.01477 *
## Anios_de_contrato_t -3.6605e-03  9.9723e-03 -0.3671  0.71387
## X_Juegos_iniciados_2_t -2.1061e-04  2.6915e-04 -0.7825  0.43463
## X_Juegos_iniciados_2_t_1 7.2625e-05  1.5408e-04  0.4714  0.63778
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3087936  0.1517489  2.0349  0.04287 *
## Edad_t           -0.0106098  0.0048907 -2.1694  0.03096 *
## Anios_de_contrato_t -0.0035245  0.0098887 -0.3564  0.72181
## X_Porcentaje_On_base_plus_slugging_t -0.0321741  0.0229358 -1.4028  0.16187
## X_Porcentaje_On_base_plus_slugging_t_1 0.0115588  0.0265548  0.4353  0.66372
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2720915  0.1505294  1.8076  0.07183
## Edad_t           -0.0097505  0.0048653 -2.0041  0.04609
## Anios_de_contrato_t -0.0018960  0.0095528 -0.1985  0.84283
## X_Porcentaje_On_base_plus_slugging_2_t -0.0357406  0.0176901 -2.0204  0.04437

```

```

## X_Porcentaje_On_base_plus_slugging_2_t_1 0.0175085 0.0182770 0.9579 0.33898
##
## (Intercept) .
## Edad_t *
## Anios_de_contrato_t
## X_Porcentaje_On_base_plus_slugging_2_t *
## X_Porcentaje_On_base_plus_slugging_2_t_1
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.3096951 0.1492777 2.0746 0.03900 *
## Edad_t -0.0106697 0.0048415 -2.2038 0.02841 *
## Anios_de_contrato_t -0.0039764 0.0098091 -0.4054 0.68553
## X_Porcentaje_on_base_t -0.0434346 0.0360984 -1.2032 0.22998
## X_Porcentaje_on_base_t_1 0.0220223 0.0351888 0.6258 0.53197
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.2943757 0.1464581 2.0100 0.04546 *
## Edad_t -0.0103259 0.0047471 -2.1752 0.03051 *
## Anios_de_contrato_t -0.0037269 0.0095740 -0.3893 0.69740
## X_Porcentaje_on_base_2_t -0.0609115 0.0383355 -1.5889 0.11329
## X_Porcentaje_on_base_2_t_1 0.0234753 0.0365783 0.6418 0.52158
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.3256852 0.1441223 2.2598 0.02466 *
## Edad_t -0.0110569 0.0046415 -2.3822 0.01793 *
## Anios_de_contrato_t -0.0023855 0.0099946 -0.2387 0.81155
## X_Porcentaje_slugging_t -0.0264622 0.0264757 -0.9995 0.31848
## X_Porcentaje_slugging_t_1 -0.0113022 0.0277972 -0.4066 0.68464
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.28386166 0.14441374 1.9656 0.05040 .
## Edad_t -0.01020166 0.00467413 -2.1826 0.02996 *
## Anios_de_contrato_t -0.00083417 0.00989888 -0.0843 0.93291
## X_Porcentaje_slugging_2_t -0.06644240 0.03115449 -2.1327 0.03388 *

```

```

## X_Porcentaje_slugging_2_t_1 0.03466126 0.02663852 1.3012 0.19435
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.32450448 0.14195493  2.2860 0.02306 *
## Edad_t         -0.01126583 0.00461647 -2.4404 0.01534 *
## Anios_de_contrato_t -0.00069973 0.00995584 -0.0703 0.94402
## X_Runs_batted_in_t -0.00590629 0.00263525 -2.2413 0.02585 *
## X_Runs_batted_in_t_1 0.00097631 0.00240712  0.4056 0.68537
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.32526413 0.14419233  2.2558 0.02491 *
## Edad_t         -0.01122798 0.00463574 -2.4220 0.01612 *
## Anios_de_contrato_t -0.00439303 0.00990287 -0.4436 0.65769
## X_Runs_batted_in_2_t -0.00019329 0.00040067 -0.4824 0.62991
## X_Runs_batted_in_2_t_1 0.00024217 0.00028223  0.8580 0.39166
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.3108509 0.1422345  2.1855 0.029743 *
## Edad_t         -0.0107455 0.0046006 -2.3357 0.020265 *
## Anios_de_contrato_t -0.0062010 0.0097331 -0.6371 0.524613
## X_Triples_t     -0.0189918 0.0127909 -1.4848 0.138806
## X_Triples_t_1    0.0206949 0.0079680  2.5973 0.009931 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.31311308 0.14524787  2.1557 0.03202 *
## Edad_t         -0.01091847 0.00470423 -2.3210 0.02106 *
## Anios_de_contrato_t -0.00376058 0.00984981 -0.3818 0.70293
## X_Triples_2_t   -0.00432543 0.00583783 -0.7409 0.45940
## X_Triples_2_t_1  0.00091866 0.00104983  0.8751 0.38235
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:

```

```
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3784808  0.1415553  2.6737 0.007974 **
## Edad_t           -0.0122714  0.0045351 -2.7059 0.007261 **
## Anios_de_contrato_t -0.0078563  0.0098586 -0.7969 0.426231
## X_WAR_t           0.0196486  0.0106382  1.8470 0.065882 .
## X_WAR_t_1         0.0279239  0.0106270  2.6276 0.009107 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3553676  0.1389541  2.5574 0.011110 *
## Edad_t           -0.0119955  0.0044944 -2.6690 0.008084 **
## Anios_de_contrato_t -0.0007253  0.0097954 -0.0740 0.941031
## X_WAR_2_t         0.0079123  0.0056594  1.3981 0.163276
## X_WAR_2_t_1       0.0113438  0.0062230  1.8229 0.069464 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Starting pitcher

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_fielder_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_s <- paste(vars, stat_fielder_t[[i]],
                        sep = '+')
  formula <- paste(base_vars_s,
                   stat_fielder_t_1[[i]],
                   sep = " + ")

  s_m_pooled_i <- plm(formula, data = starting_first_two,
                      model = "pooling",
                      index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(s_m_pooled_i,
                           vcov = vcovHC(s_m_pooled_i,
                                           type = "HC1",
                                           cluster = "group"))

  print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.7445e-01  2.6801e-01  1.0240  0.3082
## Edad_t           -7.4136e-03  7.9423e-03 -0.9334  0.3528
## Anios_de_contrato_t -4.9574e-03  2.1986e-02 -0.2255  0.8220
```

```

## X_Bateos_2_t      -2.9072e-04  1.8320e-04 -1.5869  0.1156
## X_Bateos_2_t_1    -2.9414e-05  1.4531e-04 -0.2024  0.8400
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.34011263  0.25816435  1.3174  0.1906
## Edad_t           -0.00903101  0.00774718 -1.1657  0.2464
## Anios_de_contrato_t -0.01409078  0.02136860 -0.6594  0.5111
## X_Bateos_t        -0.00215346  0.00314744 -0.6842  0.4954
## X_Bateos_t_1       0.00063914  0.00207431  0.3081  0.7586
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.35269174  0.25840481  1.3649  0.1753
## Edad_t           -0.00947117  0.00770143 -1.2298  0.2216
## Anios_de_contrato_t -0.01456610  0.02032872 -0.7165  0.4753
## X_Carreras_2_t    -0.00026104  0.00031452 -0.8300  0.4085
## X_Carreras_2_t_1  -0.00013382  0.00020874 -0.6411  0.5229
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.7156e-01  2.7673e-01  1.3427  0.1823
## Edad_t           -1.0060e-02  8.2719e-03 -1.2162  0.2267
## Anios_de_contrato_t -1.6481e-02  2.0993e-02 -0.7851  0.4342
## X_Carreras_ganadas_2_t  4.5023e-05  4.0337e-04  0.1116  0.9113
## X_Carreras_ganadas_2_t_1 -2.2767e-04  2.3535e-04 -0.9674  0.3356
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.30639962  0.25903522  1.1828  0.23959
## Edad_t           -0.00791962  0.00774771 -1.0222  0.30909
## Anios_de_contrato_t -0.01087037  0.02120987 -0.5125  0.60939
## X_Carreras_ganadas_t -0.00573830  0.00316371 -1.8138  0.07262
## X_Carreras_ganadas_t_1 0.00027758  0.00237369  0.1169  0.90714
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.32667020  0.25942633  1.2592  0.2108
## Edad_t           -0.00853283  0.00778348 -1.0963  0.2755
## Anios_de_contrato_t -0.01210364  0.02122997 -0.5701  0.5698
## X_Carreras_t      -0.00455170  0.00329162 -1.3828  0.1697
## X_Carreras_t_1     0.00010025  0.00243581  0.0412  0.9673

```

```

##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.4280e-01  2.5795e-01  1.3289 0.186801
## Edad_t           -8.7889e-03  7.8590e-03 -1.1183 0.266031
## Anios_de_contrato_t -2.2083e-02  1.9513e-02 -1.1317 0.260377
## X_Comando_2_t      8.7525e-03  9.9333e-03  0.8811 0.380300
## X_Comando_2_t_1    -1.1581e-05  3.2899e-06 -3.5201 0.000644 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.34600374  0.25617687  1.3506 0.179769
## Edad_t           -0.00902013  0.00776102 -1.1622 0.247826
## Anios_de_contrato_t -0.01972979  0.02031922 -0.9710 0.333827
## X_Comando_t       0.01277017  0.01821736  0.7010 0.484891
## X_Comando_t_1     -0.00132001  0.00044292 -2.9803 0.003593 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3752966  0.2510701  1.4948 0.1380
## Edad_t           -0.0113690  0.0075031 -1.5152 0.1328
## Anios_de_contrato_t -0.0144605  0.0210259 -0.6877 0.4932
## X_Control_2_t     -0.1125828  0.0792063 -1.4214 0.1582
## X_Control_2_t_1   -0.1370723  0.0325326 -4.2134 5.406e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3359174  0.2366284  1.4196 0.158744
## Edad_t           -0.0091728  0.0070887 -1.2940 0.198559
## Anios_de_contrato_t -0.0215856  0.0213077 -1.0130 0.313414
## X_Control_t       0.0703111  0.0506556  1.3880 0.168126
## X_Control_t_1     -0.1120206  0.0388348 -2.8845 0.004774 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3082677  0.2458509  1.2539 0.212724

```

```

## Edad_t          -0.0068876  0.0073628 -0.9355 0.351741
## Anios_de_contrato_t -0.0222154  0.0195876 -1.1342 0.259361
## X_Dominio_2_t      0.0361912  0.0446375  0.8108 0.419361
## X_Dominio_2_t_1     0.0857540  0.0325465  2.6348 0.009718 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.2561954  0.2458764  1.0420 0.299866
## Edad_t         -0.0052696  0.0073993 -0.7122 0.477962
## Anios_de_contrato_t -0.0216423  0.0192686 -1.1232 0.263967
## X_Dominio_t      0.0129671  0.0316922  0.4092 0.683275
## X_Dominio_t_1     0.0927221  0.0288620  3.2126 0.001756 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.32100341  0.25899304  1.2394 0.21800
## Edad_t         -0.00915230  0.00768651 -1.1907 0.23651
## Anios_de_contrato_t -0.01436638  0.02223254 -0.6462 0.51960
## X_ERA_2_t       0.00063814  0.00703160  0.0908 0.92786
## X_ERA_2_t_1     -0.00867421  0.00350768 -2.4729 0.01504 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.2978057  0.2419376  1.2309 0.22116
## Edad_t         -0.0080756  0.0071269 -1.1331 0.25979
## Anios_de_contrato_t -0.0187637  0.0202142 -0.9282 0.35545
## X_ERA_t         -0.0163745  0.0116387 -1.4069 0.16246
## X_ERA_t_1       -0.0296793  0.0116668 -2.5439 0.01245 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.7271e-01  2.6736e-01  1.0200 0.3101
## Edad_t         -7.5435e-03  7.8987e-03 -0.9550 0.3418
## Anios_de_contrato_t -6.6641e-03  2.2270e-02 -0.2992 0.7654
## X_Inning_pitched_2_t -2.7424e-04  1.7992e-04 -1.5243 0.1305
## X_Inning_pitched_2_t_1 8.0161e-05  1.2789e-04  0.6268 0.5322
##
##

```

```

## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3344235  0.2738465  1.2212  0.2248
## Edad_t           -0.0090919  0.0080931 -1.1234  0.2639
## Anios_de_contrato_t -0.0141622  0.0222362 -0.6369  0.5256
## X_Inning_pitched_t -0.0017387  0.0020946 -0.8301  0.4084
## X_Inning_pitched_t_1 0.0010201  0.0020437  0.4991  0.6187
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3299996  0.2528874  1.3049  0.19483
## Edad_t           -0.0087269  0.0075488 -1.1561  0.25033
## Anios_de_contrato_t -0.0171933  0.0181500 -0.9473  0.34571
## X_Losses_2_t       -0.0046136  0.0023382 -1.9732  0.05116 .
## X_Losses_2_t_1      0.0010212  0.0019213  0.5315  0.59622
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.34360811  0.25456608  1.3498  0.1800
## Edad_t           -0.00915524  0.00760478 -1.2039  0.2314
## Anios_de_contrato_t -0.01646550  0.01912588 -0.8609  0.3913
## X_Losses_t        -0.01272798  0.00802628 -1.5858  0.1159
## X_Losses_t_1       0.00043667  0.00620359  0.0704  0.9440
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.4059796  0.2723844  1.4905  0.13916
## Edad_t           -0.0110801  0.0080652 -1.3738  0.17248
## Anios_de_contrato_t -0.0177460  0.0212314 -0.8358  0.40518
## X_Saves_2_t        0.2605779  0.1523637  1.7102  0.09023 .
## X_Saves_2_t_1       0.0239704  0.0129249  1.8546  0.06652 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.4088283  0.2683224  1.5236  0.1307
## Edad_t           -0.0111289  0.0079314 -1.4031  0.1636
## Anios_de_contrato_t -0.0177150  0.0212623 -0.8332  0.4067
## X_Saves_t          0.1318160  0.0888189  1.4841  0.1408
## X_Saves_t_1        0.0716270  0.0435604  1.6443  0.1032
##
##

```



```

## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.37584291  0.24943400  1.5068  0.13493
## Edad_t           -0.01021287  0.00735577 -1.3884  0.16801
## Anios_de_contrato_t -0.02095726  0.01912981 -1.0955  0.27584
## X_Strike_outs_2_t  -0.00018562  0.00013911 -1.3344  0.18503
## X_Strike_outs_2_t_1  0.00040747  0.00020653  1.9729  0.05119 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.7439e-01  2.6278e-01  1.4247  0.1573
## Edad_t           -1.0153e-02  7.7954e-03 -1.3024  0.1957
## Anios_de_contrato_t -2.0090e-02  2.1553e-02 -0.9321  0.3534
## X_Strike_outs_t     1.8765e-05  1.9203e-03  0.0098  0.9922
## X_Strike_outs_t_1    1.0960e-03  2.1919e-03  0.5000  0.6181
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.43618477  0.25738969  1.6946  0.09316 .
## Edad_t           -0.01181613  0.00765286 -1.5440  0.12565
## Anios_de_contrato_t -0.02217911  0.02023949 -1.0958  0.27571
## X_WAR_2_t         -0.00035476  0.00544075 -0.0652  0.94814
## X_WAR_2_t_1        0.01232224  0.00509781  2.4172  0.01740 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.4274708  0.2700552  1.5829  0.1165
## Edad_t           -0.0114011  0.0080028 -1.4246  0.1573
## Anios_de_contrato_t -0.0237535  0.0208165 -1.1411  0.2565
## X_WAR_t           0.0095755  0.0140483  0.6816  0.4970
## X_WAR_t_1         0.0237159  0.0156448  1.5159  0.1326
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2352589  0.2361475  0.9962  0.3214697
## Edad_t           -0.0066048  0.0069503 -0.9503  0.3441835
## Anios_de_contrato_t -0.0203819  0.0222218 -0.9172  0.3611789
## X_WHIP_2_t        -0.0168131  0.0177828 -0.9455  0.3466330
## X_WHIP_2_t_1      -0.0556221  0.0154042 -3.6108  0.0004734 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```

##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3479720  0.2377156   1.4638 0.146289
## Edad_t           -0.0092461  0.0070290  -1.3154 0.191287
## Anios_de_contrato_t -0.0249382  0.0222817  -1.1192 0.265649
## X_WHIP_t          -0.0084441  0.0185965  -0.4541 0.650734
## X_WHIP_t_1        -0.0504214  0.0174341  -2.8921 0.004669 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.36377559  0.25943395   1.4022 0.1639
## Edad_t           -0.00987884  0.00772045  -1.2796 0.2036
## Anios_de_contrato_t -0.01618871  0.02077905  -0.7791 0.4377
## X_Walks_2_t       -0.00032521  0.00049170  -0.6614 0.5098
## X_Walks_2_t_1      0.00010279  0.00047799   0.2151 0.8302
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.40160570  0.28000841   1.4343 0.1545
## Edad_t           -0.01089892  0.00833705  -1.3073 0.1940
## Anios_de_contrato_t -0.01824949  0.02170440  -0.8408 0.4024
## X_Walks_t         0.00083802  0.00445324   0.1882 0.8511
## X_Walks_t_1       -0.00293485  0.00452200  -0.6490 0.5178
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.38277732  0.25452562   1.5039 0.1357
## Edad_t           -0.01027384  0.00759552  -1.3526 0.1791
## Anios_de_contrato_t -0.02034822  0.01988579  -1.0233 0.3086
## X_Wins_2_t        0.00039041  0.00174223   0.2241 0.8231
## X_Wins_2_t_1      0.00079245  0.00201861   0.3926 0.6954
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2931438  0.2777993   1.0552 0.2938
## Edad_t           -0.0080519  0.0081989  -0.9821 0.3284
## Anios_de_contrato_t -0.0081754  0.0229170  -0.3567 0.7220
## X_Wins_t          -0.0123682  0.0086590  -1.4284 0.1562
## X_Wins_t_1        0.0034439  0.0082138   0.4193 0.6759

```

Efectos fijos

Bateadores

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_hitter_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_h <- paste(vars, stat_hitter_t[[i]],
                      sep = '+')
  formula <- paste(base_vars_h,
                  stat_hitter_t_1[[i]],
                  sep = " + ")

  h_m_fix_ef_i <- plm(formula, data = hitter_first_two,
                     model = "within",
                     index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(h_m_fix_ef_i,
                          vcov = vcovHC(h_m_fix_ef_i,
                                         type = "HC1",
                                         cluster = "group"))

  print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.01034102  0.01275226  0.8109  0.4189
## Anios_de_contrato_t -0.01887658  0.01178735 -1.6014  0.1117
## X_At_bats_t        0.00083949  0.00096005  0.8744  0.3835
## X_At_bats_t_1      0.00074170  0.00112465  0.6595  0.5108
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          6.9455e-03  1.2799e-02  0.5427  0.5883
## Anios_de_contrato_t -1.8905e-02  1.2498e-02 -1.5126  0.1328
## X_At_bats_2_t      -5.1986e-06  3.5402e-05 -0.1468  0.8835
## X_At_bats_2_t_1     1.5249e-05  3.5794e-05  0.4260  0.6708
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          7.2482e-03  1.3133e-02  0.5519  0.5820
## Anios_de_contrato_t -1.8764e-02  1.2184e-02 -1.5400  0.1260
## X_Bateos_t       -3.5993e-05  1.2348e-03 -0.0291  0.9768
## X_Bateos_t_1      8.1055e-04  1.8936e-03  0.4281  0.6693
##
##
```

```

## t test of coefficients:
##
##
##          Estimate Std. Error t value Pr(>|t|)
## Edad_t      6.2060e-03  1.1568e-02  0.5365  0.5925
## Anios_de_contrato_t -1.7946e-02  1.2262e-02 -1.4636  0.1457
## X_Bateos_2_t      -1.1623e-04  1.3547e-04 -0.8580  0.3925
## X_Bateos_2_t_1      4.5911e-05  7.2542e-05  0.6329  0.5279
##
##
## t test of coefficients:
##
##
##          Estimate Std. Error t value Pr(>|t|)
## Edad_t      0.0058186  0.0114534  0.5080  0.61231
## Anios_de_contrato_t -0.0193282  0.0125321 -1.5423  0.12545
## X_Bateos_promedio_t  0.0334774  0.0243475  1.3750  0.17152
## X_Bateos_promedio_t_1 0.0636449  0.0354961  1.7930  0.07531 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
##          Estimate Std. Error t value Pr(>|t|)
## Edad_t      0.0069776  0.0112198  0.6219  0.5351
## Anios_de_contrato_t -0.0167877  0.0117476 -1.4290  0.1554
## X_Bateos_promedio_2_t -0.0417744  0.0662986 -0.6301  0.5297
## X_Bateos_promedio_2_t_1 0.0410127  0.0315156  1.3013  0.1955
##
##
## t test of coefficients:
##
##
##          Estimate Std. Error t value Pr(>|t|)
## Edad_t      0.00602423  0.01157534  0.5204  0.6037
## Anios_de_contrato_t -0.01843816  0.01201956 -1.5340  0.1275
## X_Dobles_t      -0.00070858  0.00399172 -0.1775  0.8594
## X_Dobles_t_1      0.00078497  0.00275816  0.2846  0.7764
##
##
## t test of coefficients:
##
##
##          Estimate Std. Error t value Pr(>|t|)
## Edad_t      0.00648391  0.01150879  0.5634  0.5741
## Anios_de_contrato_t -0.01792560  0.01269548 -1.4120  0.1604
## X_Dobles_2_t      -0.00027003  0.00075456 -0.3579  0.7210
## X_Dobles_2_t_1      0.00035096  0.00027314  1.2849  0.2011
##
##
## t test of coefficients:
##
##
##          Estimate Std. Error t value Pr(>|t|)
## Edad_t      0.0070080  0.0137133  0.5110  0.6102
## Anios_de_contrato_t -0.0197645  0.0123954 -1.5945  0.1133
## X_Home_runs_t      0.0033840  0.0061821  0.5474  0.5851
## X_Home_runs_t_1      0.0019250  0.0046029  0.4182  0.6765

```

```

##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.00808445  0.01227093  0.6588  0.5112
## Anios_de_contrato_t -0.01825673  0.01395108 -1.3086  0.1930
## X_Home_runs_2_t    -0.00037042  0.00111817 -0.3313  0.7410
## X_Home_runs_2_t_1   0.00082375  0.00095639  0.8613  0.3907
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.0107680  0.0128734  0.8365  0.4044
## Anios_de_contrato_t -0.0189302  0.0117643 -1.6091  0.1100
## X_Juegos_iniciados_t  0.0019660  0.0018636  1.0550  0.2934
## X_Juegos_iniciados_t_1 0.0014323  0.0020490  0.6990  0.4858
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          8.3507e-03  1.3412e-02  0.6226  0.5346
## Anios_de_contrato_t -1.7664e-02  1.2110e-02 -1.4586  0.1471
## X_Juegos_iniciados_2_t  1.6974e-04  1.5282e-04  1.1107  0.2688
## X_Juegos_iniciados_2_t_1 7.9365e-05  1.4773e-04  0.5372  0.5920
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.006587  0.011365  0.5796  0.56322
## Anios_de_contrato_t -0.022042  0.012840 -1.7166  0.08845 .
## X_Porcentaje_On_base_plus_slugging_t  0.017949  0.012145  1.4779  0.14188
## X_Porcentaje_On_base_plus_slugging_t_1 0.050361  0.031288  1.6096  0.10993
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.0063134  0.0113742  0.5551  0.5798
## Anios_de_contrato_t -0.0162065  0.0121801 -1.3306  0.1857
## X_Porcentaje_On_base_plus_slugging_2_t -0.0213507  0.0296495 -0.7201  0.4728
## X_Porcentaje_On_base_plus_slugging_2_t_1 0.0158527  0.0140789  1.1260  0.2623
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.0074632  0.0112072  0.6659  0.50665
## Anios_de_contrato_t -0.0225334  0.0125370 -1.7974  0.07462 .

```

```

## X_Porcentaje_on_base_t      0.0587678  0.0502380  1.1698  0.24424
## X_Porcentaje_on_base_t_1    0.0929729  0.0451633  2.0586  0.04155 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.0082195  0.0113525  0.7240  0.47036
## Anios_de_contrato_t -0.0201230  0.0131170 -1.5341  0.12745
## X_Porcentaje_on_base_2_t    0.1251878  0.0690311  1.8135  0.07208 .
## X_Porcentaje_on_base_2_t_1  0.0262373  0.0331801  0.7908  0.43054
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.0059430  0.0119952  0.4955  0.6211
## Anios_de_contrato_t -0.0213908  0.0134023 -1.5961  0.1129
## X_Porcentaje_slugging_t -0.0033105  0.0235975 -0.1403  0.8886
## X_Porcentaje_slugging_t_1  0.0566577  0.0436431  1.2982  0.1965
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.0070806  0.0118430  0.5979  0.5510
## Anios_de_contrato_t -0.0163885  0.0119961 -1.3662  0.1743
## X_Porcentaje_slugging_2_t -0.0338612  0.0435041 -0.7783  0.4378
## X_Porcentaje_slugging_2_t_1  0.0140510  0.0214702  0.6544  0.5140
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.00803719  0.01202169  0.6686  0.5050
## Anios_de_contrato_t -0.01779548  0.01226291 -1.4512  0.1492
## X_Runs_batted_in_t -0.00022954  0.00204471 -0.1123  0.9108
## X_Runs_batted_in_t_1  0.00268616  0.00194255  1.3828  0.1691
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          6.4785e-03  1.2768e-02  0.5074  0.6127
## Anios_de_contrato_t -1.8815e-02  1.2155e-02 -1.5480  0.1241
## X_Runs_batted_in_2_t  6.9733e-05  2.4482e-04  0.2848  0.7762
## X_Runs_batted_in_2_t_1 8.3704e-05  2.9700e-04  0.2818  0.7785
##
##
## t test of coefficients:

```

```
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.00612137  0.01205692  0.5077  0.6125
## Anios_de_contrato_t -0.01749900  0.01229140 -1.4237  0.1570
## X_Triples_t      0.00025778  0.01931476  0.0133  0.9894
## X_Triples_t_1    0.00570433  0.01905831  0.2993  0.7652
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.0060247  0.0121133  0.4974  0.6198
## Anios_de_contrato_t -0.0170197  0.0120956 -1.4071  0.1618
## X_Triples_2_t     0.0023253  0.0057199  0.4065  0.6850
## X_Triples_2_t_1   0.0036070  0.0071830  0.5022  0.6164
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.0028759  0.0108808  0.2643  0.79196
## Anios_de_contrato_t -0.0236564  0.0132075 -1.7911  0.07562 .
## X_WAR_t        0.0198599  0.0103390  1.9209  0.05695 .
## X_WAR_t_1      0.0078594  0.0131129  0.5994  0.54998
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.0049039  0.0100435  0.4883  0.6262
## Anios_de_contrato_t -0.0191525  0.0147067 -1.3023  0.1951
## X_WAR_2_t      0.0034614  0.0067962  0.5093  0.6114
## X_WAR_2_t_1    0.0084917  0.0084929  0.9999  0.3193
```

Starting pitcher

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_fielder_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_s <- paste(vars, stat_fielder_t[[i]],
                        sep = '+')
  formula <- paste(base_vars_s,
                    stat_fielder_t_1[[i]],
                    sep = " + ")

  s_m_fix_ef_i <- plm(formula, data = starting_first_two,
                       model = "within",
                       index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(s_m_fix_ef_i,
```

```

vcov = vcovHC(s_m_fix_ef_i,
              type = "HC1",
              cluster = "group"))

print(my_lm_cluster)
}

```

```

##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          -2.4364e-03  2.2078e-02 -0.1104  0.9126
## Anios_de_contrato_t  3.6280e-03  8.0867e-03  0.4486  0.6556
## X_Bateos_2_t       -1.0077e-04  1.2121e-04 -0.8314  0.4097
## X_Bateos_2_t_1      2.3152e-05  1.2399e-04  0.1867  0.8526
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.00221083  0.01733680 -0.1275  0.89904
## Anios_de_contrato_t -0.01779876  0.01125168 -1.5819  0.11998
## X_Bateos_t         0.00527762  0.00289073  1.8257  0.07387 .
## X_Bateos_t_1       0.00005433  0.00153710  0.0353  0.97194
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          3.9738e-04  2.0604e-02  0.0193  0.9847
## Anios_de_contrato_t -1.1642e-03  8.1569e-03 -0.1427  0.8871
## X_Carreras_2_t      3.1326e-05  1.8901e-04  0.1657  0.8690
## X_Carreras_2_t_1    1.9075e-04  1.9513e-04  0.9775  0.3330
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.00052911  0.02015800  0.0262  0.9792
## Anios_de_contrato_t -0.00091005  0.00807381 -0.1127  0.9107
## X_Carreras_ganadas_2_t -0.00014784  0.00020022 -0.7384  0.4637
## X_Carreras_ganadas_2_t_1 0.00019136  0.00021377  0.8951  0.3750
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.00360790  0.02031244  0.1776  0.85974
## Anios_de_contrato_t -0.00118425  0.00866590 -0.1367  0.89185
## X_Carreras_ganadas_t  0.00050666  0.00194413  0.2606  0.79546
## X_Carreras_ganadas_t_1 0.00399798  0.00209693  1.9066  0.06233 .

```



```

## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##           Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.0046442  0.0192551  0.2412  0.81039
## Anios_de_contrato_t -0.0070923  0.0105023 -0.6753  0.50259
## X_Carreras_t       0.0026874  0.0019678  1.3657  0.17814
## X_Carreras_t_1     0.0040211  0.0020620  1.9501  0.05678 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##           Estimate Std. Error t value Pr(>|t|)
## Edad_t          -1.9195e-03  2.1491e-02 -0.0893  0.9292
## Anios_de_contrato_t -1.1802e-04  7.3424e-03 -0.0161  0.9872
## X_Comando_2_t      -5.9202e-04  6.2507e-03 -0.0947  0.9249
## X_Comando_2_t_1     1.4174e-07  2.4019e-06  0.0590  0.9532
##
##
## t test of coefficients:
##
##           Estimate Std. Error t value Pr(>|t|)
## Edad_t           0.00089785  0.02099532  0.0428  0.9661
## Anios_de_contrato_t -0.00716261  0.00625456 -1.1452  0.2576
## X_Comando_t        0.02103282  0.02647059  0.7946  0.4306
## X_Comando_t_1       0.00015721  0.00018870  0.8331  0.4087
##
##
## t test of coefficients:
##
##           Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.00076763  0.01961416 -0.0391  0.9689
## Anios_de_contrato_t 0.00159899  0.00953803  0.1676  0.8675
## X_Control_2_t      -0.04956230  0.06906737 -0.7176  0.4763
## X_Control_2_t_1     -0.03665745  0.02278657 -1.6087  0.1140
##
##
## t test of coefficients:
##
##           Estimate Std. Error t value Pr(>|t|)
## Edad_t           0.0010556  0.0176658  0.0598  0.9526
## Anios_de_contrato_t -0.0023129  0.0097522 -0.2372  0.8135
## X_Control_t        -0.0036154  0.0381645 -0.0947  0.9249
## X_Control_t_1       -0.0626009  0.0478256 -1.3089  0.1965
##
##
## t test of coefficients:
##
##           Estimate Std. Error t value Pr(>|t|)

```

```

## Edad_t          -0.0014529  0.0181923 -0.0799  0.93667
## Anios_de_contrato_t  0.0025374  0.0085789  0.2958  0.76863
## X_Dominio_2_t      -0.0081874  0.0320849 -0.2552  0.79963
## X_Dominio_2_t_1     0.0245557  0.0138554  1.7723  0.08244 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.0026860  0.0192901 -0.1392  0.8898
## Anios_de_contrato_t -0.0032145  0.0097844 -0.3285  0.7439
## X_Dominio_t       0.0136773  0.0117819  1.1609  0.2512
## X_Dominio_t_1     0.0127089  0.0203625  0.6241  0.5354
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.0038815  0.0195470  0.1986  0.8434
## Anios_de_contrato_t 0.0085990  0.0104976  0.8191  0.4166
## X_ERA_2_t        0.0045426  0.0104506  0.4347  0.6657
## X_ERA_2_t_1      -0.0039322  0.0075314 -0.5221  0.6039
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.00083873  0.01689477 -0.0496  0.96060
## Anios_de_contrato_t 0.00921946  0.00987257  0.9338  0.35487
## X_ERA_t          0.02141472  0.01092820  1.9596  0.05563 .
## X_ERA_t_1        -0.01231102  0.00933135 -1.3193  0.19307
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -8.5349e-04  2.0685e-02 -0.0413  0.9673
## Anios_de_contrato_t 2.3567e-03  8.5004e-03  0.2772  0.7827
## X_Inning_pitched_2_t -7.8717e-05  1.0792e-04 -0.7294  0.4691
## X_Inning_pitched_2_t_1 5.0646e-05  1.1537e-04  0.4390  0.6626
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.00162877  0.01923136  0.0847  0.9328
## Anios_de_contrato_t 0.00169747  0.01131759  0.1500  0.8814
## X_Inning_pitched_t -0.00054084  0.00132168 -0.4092  0.6841
## X_Inning_pitched_t_1 0.00234504  0.00142074  1.6506  0.1051
##

```

```

##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -8.3776e-04 1.9830e-02 -0.0422  0.9665
## Anios_de_contrato_t -5.9658e-05 9.2676e-03 -0.0064  0.9949
## X_Losses_2_t      6.4335e-04 1.1226e-03  0.5731  0.5692
## X_Losses_2_t_1     4.0951e-04 1.2654e-03  0.3236  0.7476
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -4.6319e-05 2.0322e-02 -0.0023  0.9982
## Anios_de_contrato_t -1.8721e-03 9.1531e-03 -0.2045  0.8388
## X_Losses_t       4.5002e-03 4.9801e-03  0.9036  0.3705
## X_Losses_t_1     4.2807e-03 6.1954e-03  0.6910  0.4928
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.00168837 0.01942934 -0.0869  0.9311
## Anios_de_contrato_t -0.00032729 0.00867564 -0.0377  0.9701
## X_Saves_2_t      0.30500262 0.00472461 64.5562 <2e-16 ***
## X_Saves_2_t_1     0.00088499 0.01569245  0.0564  0.9553
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.00141491 0.01967939 -0.0719  0.9430
## Anios_de_contrato_t -0.00035181 0.00868322 -0.0405  0.9678
## X_Saves_t       0.20411335 0.01971297 10.3543 4.918e-14 ***
## X_Saves_t_1     -0.00777804 0.03592647 -0.2165  0.8295
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        5.1672e-04 1.8958e-02  0.0273  0.9784
## Anios_de_contrato_t 6.0770e-03 1.1556e-02  0.5259  0.6013
## X_Strike_outs_2_t -7.8244e-05 7.0742e-05 -1.1060  0.2740
## X_Strike_outs_2_t_1 -7.9109e-05 1.3305e-04 -0.5946  0.5548
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0015761 0.0193761 -0.0813  0.9355

```

```

## Anios_de_contrato_t -0.0086871 0.0125621 -0.6915 0.4924
## X_Strike_outs_t 0.0018349 0.0013162 1.3942 0.1694
## X_Strike_outs_t_1 0.0015657 0.0013462 1.1631 0.2503
##
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## Edad_t -0.00084226 0.01905146 -0.0442 0.9649
## Anios_de_contrato_t 0.00116735 0.00998990 0.1169 0.9074
## X_WAR_2_t -0.00280164 0.00257139 -1.0895 0.2811
## X_WAR_2_t_1 0.00021123 0.00163162 0.1295 0.8975
##
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## Edad_t 0.0033033 0.0218288 0.1513 0.8803
## Anios_de_contrato_t 0.0020709 0.0112151 0.1847 0.8542
## X_WAR_t -0.0094096 0.0091402 -1.0295 0.3082
## X_WAR_t_1 0.0142765 0.0123105 1.1597 0.2517
##
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## Edad_t 0.0084502 0.0181572 0.4654 0.6437
## Anios_de_contrato_t 0.0086511 0.0094882 0.9118 0.3663
## X_WHIP_2_t 0.0131626 0.0146668 0.8974 0.3738
## X_WHIP_2_t_1 -0.0305748 0.0164884 -1.8543 0.0696 .
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## Edad_t 0.0044983 0.0179343 0.2508 0.80298
## Anios_de_contrato_t 0.0038773 0.0078326 0.4950 0.62275
## X_WHIP_t 0.0047937 0.0214828 0.2231 0.82434
## X_WHIP_t_1 -0.0477501 0.0247494 -1.9293 0.05937 .
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## Edad_t 0.00198019 0.01803530 0.1098 0.9130
## Anios_de_contrato_t -0.00038453 0.00942010 -0.0408 0.9676
## X_Walks_2_t 0.00058561 0.00039891 1.4680 0.1484
## X_Walks_2_t_1 0.00055821 0.00037371 1.4937 0.1415
##
##

```

```
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.00398478 0.01965908  0.2027  0.8402
## Anios_de_contrato_t 0.00095726 0.01216866  0.0787  0.9376
## X_Walks_t      0.00559163 0.00314614  1.7773  0.0816 .
## X_Walks_t_1    0.00582912 0.00311074  1.8739  0.0668 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.00255566 0.02131544 -0.1199  0.9050
## Anios_de_contrato_t 0.00178877 0.01104795  0.1619  0.8720
## X_Wins_2_t     -0.00060479 0.00157661 -0.3836  0.7029
## X_Wins_2_t_1   -0.00096096 0.00169717 -0.5662  0.5738
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.00064545 0.01988486 -0.0325  0.9742
## Anios_de_contrato_t 0.00263774 0.01222707  0.2157  0.8301
## X_Wins_t       -0.00336086 0.00655597 -0.5126  0.6105
## X_Wins_t_1     0.00147913 0.00489175  0.3024  0.7636
```

Efectos aleatorios

Bateadores

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_hitter_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_h <- paste(vars, stat_hitter_t[[i]],
                        sep = '+')
  formula <- paste(base_vars_h,
                   stat_hitter_t_1[[i]],
                   sep = " + ")

  h_m_random_i <- plm(formula, data = hitter_first_two,
                      model = "random",
                      index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(h_m_random_i,
                           vcov = vcovHC(h_m_random_i,
                                           type = "HC1",
                                           cluster = "group"))

  print(my_lm_cluster)
}
```

```

##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.24257204 0.15141613  1.6020  0.1104
## Edad_t           -0.00814012 0.00511751 -1.5906  0.1129
## Anios_de_contrato_t -0.01197902 0.01078364 -1.1109  0.2677
## X_At_bats_t       -0.00037018 0.00078418 -0.4721  0.6373
## X_At_bats_t_1     -0.00023727 0.00085813 -0.2765  0.7824
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.3329e-01 1.4534e-01  1.6052  0.1097
## Edad_t           -7.8793e-03 4.9291e-03 -1.5985  0.1111
## Anios_de_contrato_t -1.2455e-02 1.0712e-02 -1.1627  0.2460
## X_At_bats_2_t     -2.9383e-05 3.7550e-05 -0.7825  0.4346
## X_At_bats_2_t_1   -6.4628e-06 2.3670e-05 -0.2730  0.7850
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.3677e-01 1.4634e-01  1.6180  0.1069
## Edad_t           -7.9746e-03 4.9648e-03 -1.6062  0.1094
## Anios_de_contrato_t -1.1610e-02 1.0852e-02 -1.0699  0.2857
## X_Bateos_t        -2.0605e-03 1.2577e-03 -1.6383  0.1026
## X_Bateos_t_1       7.7754e-05 1.2481e-03  0.0623  0.9504
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.1746e-01 1.4487e-01  1.5011  0.1345
## Edad_t           -7.4198e-03 4.8930e-03 -1.5164  0.1306
## Anios_de_contrato_t -1.1441e-02 1.0824e-02 -1.0570  0.2915
## X_Bateos_2_t      -1.9078e-04 1.3021e-04 -1.4652  0.1441
## X_Bateos_2_t_1     9.9309e-05 7.9235e-05  1.2534  0.2112
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2124062 0.1491263  1.4243  0.1555
## Edad_t           -0.0074467 0.0050318 -1.4799  0.1401
## Anios_de_contrato_t -0.0125393 0.0105389 -1.1898  0.2352
## X_Bateos_promedio_t -0.0144705 0.0223632 -0.6471  0.5182
## X_Bateos_promedio_t_1 0.0411302 0.0251456  1.6357  0.1031
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)

```

```

## (Intercept)          0.2012315  0.1504239  1.3378  0.1821
## Edad_t               -0.0069564  0.0050730 -1.3713  0.1715
## Anios_de_contrato_t  -0.0120213  0.0104008 -1.1558  0.2488
## X_Bateos_promedio_2_t -0.0501889  0.0374146 -1.3414  0.1809
## X_Bateos_promedio_2_t_1 0.0384658  0.0251106  1.5319  0.1268
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.24081226  0.14298315  1.6842  0.09334 .
## Edad_t         -0.00815186  0.00484674 -1.6819  0.09378 .
## Anios_de_contrato_t -0.01173798  0.01081592 -1.0853  0.27881
## X_Dobles_t      -0.00501361  0.00331538 -1.5122  0.13169
## X_Dobles_t_1     -0.00088251  0.00251015 -0.3516  0.72544
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.21345305  0.14273447  1.4955  0.1360
## Edad_t         -0.00730750  0.00482624 -1.5141  0.1312
## Anios_de_contrato_t -0.01110924  0.01111984 -0.9990  0.3187
## X_Dobles_2_t     -0.00070199  0.00065492 -1.0719  0.2848
## X_Dobles_2_t_1    0.00050248  0.00033390  1.5049  0.1336
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.22500829  0.14970874  1.5030  0.1341
## Edad_t         -0.00755724  0.00508165 -1.4872  0.1382
## Anios_de_contrato_t -0.01330987  0.01076949 -1.2359  0.2176
## X_Home_runs_t    0.00124542  0.00492202  0.2530  0.8004
## X_Home_runs_t_1   0.00073804  0.00310135  0.2380  0.8121
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.21723573  0.14435144  1.5049  0.1336
## Edad_t         -0.00733540  0.00495291 -1.4810  0.1398
## Anios_de_contrato_t -0.01282280  0.01185239 -1.0819  0.2803
## X_Home_runs_2_t  -0.00040412  0.00092375 -0.4375  0.6621
## X_Home_runs_2_t_1  0.00046099  0.00066811  0.6900  0.4908
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.24433673  0.15170224  1.6106  0.1085
## Edad_t         -0.00821010  0.00514303 -1.5964  0.1116

```

```

## Anios_de_contrato_t      -0.01201002  0.01078982 -1.1131   0.2667
## X_Juegos_iniciados_t     -0.00093702  0.00144820 -0.6470   0.5182
## X_Juegos_iniciados_t_1   -0.00039517  0.00160719 -0.2459   0.8060
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.2480e-01  1.4845e-01  1.5143   0.1311
## Edad_t           -7.5713e-03  5.0517e-03 -1.4988   0.1351
## Anios_de_contrato_t -1.3018e-02  1.0649e-02 -1.2225   0.2226
## X_Juegos_iniciados_2_t  9.8853e-06  1.5917e-04  0.0621   0.9505
## X_Juegos_iniciados_2_t_1 2.4099e-05  1.0068e-04  0.2394   0.8110
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2184763  0.1501918  1.4546   0.1470
## Edad_t           -0.0075223  0.0050125 -1.5007   0.1346
## Anios_de_contrato_t -0.0136733  0.0108105 -1.2648   0.2071
## X_Porcentaje_On_base_plus_slugging_t -0.0148598  0.0129949 -1.1435   0.2539
## X_Porcentaje_On_base_plus_slugging_t_1 0.0223321  0.0215656  1.0355   0.3014
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1848537  0.1452958  1.2723   0.20441
## Edad_t           -0.0065365  0.0049369 -1.3240   0.18666
## Anios_de_contrato_t -0.0102274  0.0103789 -0.9854   0.32534
## X_Porcentaje_On_base_plus_slugging_2_t -0.0318936  0.0170134 -1.8746   0.06196
## X_Porcentaje_On_base_plus_slugging_2_t_1 0.0187110  0.0124721  1.5002   0.13476
##
## (Intercept)
## Edad_t
## Anios_de_contrato_t
## X_Porcentaje_On_base_plus_slugging_2_t .
## X_Porcentaje_On_base_plus_slugging_2_t_1
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2144650  0.1491277  1.4381   0.1516
## Edad_t           -0.0074668  0.0050065 -1.4914   0.1371
## Anios_de_contrato_t -0.0142583  0.0107662 -1.3244   0.1865
## X_Porcentaje_on_base_t -0.0115319  0.0329050 -0.3505   0.7263
## X_Porcentaje_on_base_t_1 0.0412779  0.0302583  1.3642   0.1737
##
##
## t test of coefficients:

```



```

##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2170641  0.1474737  1.4719  0.1423
## Edad_t           -0.0074181  0.0049853 -1.4880  0.1380
## Anios_de_contrato_t -0.0129105  0.0107014 -1.2064  0.2287
## X_Porcentaje_on_base_2_t -0.0109167  0.0382188 -0.2856  0.7754
## X_Porcentaje_on_base_2_t_1 0.0342474  0.0275767  1.2419  0.2154
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2359303  0.1466141  1.6092  0.1088
## Edad_t           -0.0078938  0.0049110 -1.6074  0.1092
## Anios_de_contrato_t -0.0122626  0.0108981 -1.1252  0.2615
## X_Porcentaje_slugging_t -0.0247159  0.0170934 -1.4459  0.1494
## X_Porcentaje_slugging_t_1 0.0093135  0.0263295  0.3537  0.7238
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1943655  0.1448105  1.3422  0.18070
## Edad_t           -0.0068391  0.0049289 -1.3875  0.16646
## Anios_de_contrato_t -0.0099186  0.0108160 -0.9170  0.35997
## X_Porcentaje_slugging_2_t -0.0522329  0.0288810 -1.8086  0.07167
## X_Porcentaje_slugging_2_t_1 0.0200503  0.0189199  1.0597  0.29024
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2254478  0.1471392  1.5322  0.1267
## Edad_t           -0.0076311  0.0049971 -1.5271  0.1279
## Anios_de_contrato_t -0.0109267  0.0108401 -1.0080  0.3144
## X_Runs_batted_in_t -0.0028814  0.0017794 -1.6193  0.1066
## X_Runs_batted_in_t_1 0.0014869  0.0016962  0.8766  0.3815
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.2659e-01  1.4558e-01  1.5565  0.1208
## Edad_t           -7.6125e-03  4.9340e-03 -1.5429  0.1241
## Anios_de_contrato_t -1.3135e-02  1.0661e-02 -1.2321  0.2190
## X_Runs_batted_in_2_t -1.8062e-06  2.3076e-04 -0.0078  0.9938
## X_Runs_batted_in_2_t_1 8.2055e-05  2.1872e-04  0.3752  0.7078
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)

```

```
## (Intercept)          0.2161669  0.1458450  1.4822  0.13950
## Edad_t              -0.0073480  0.0049298 -1.4905  0.13730
## Anios_de_contrato_t -0.0123297  0.0104138 -1.1840  0.23750
## X_Triples_t         -0.0076791  0.0110146 -0.6972  0.48631
## X_Triples_t_1        0.0159306  0.0088025  1.8098  0.07148 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.21964684  0.14825960  1.4815  0.1397
## Edad_t         -0.00743677  0.00501283 -1.4835  0.1391
## Anios_de_contrato_t -0.01242811  0.01059445 -1.1731  0.2418
## X_Triples_2_t    -0.00032179  0.00433692 -0.0742  0.9409
## X_Triples_2_t_1   0.00113579  0.00138107  0.8224  0.4116
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.2904483  0.1384418  2.0980 0.036868 *
## Edad_t         -0.0090751  0.0046811 -1.9387 0.053621 .
## Anios_de_contrato_t -0.0167627  0.0106906 -1.5680 0.118097
## X_WAR_t         0.0206075  0.0079055  2.6067 0.009667 **
## X_WAR_t_1       0.0184442  0.0092885  1.9857 0.048113 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.2645070  0.1336766  1.9787 0.04890 *
## Edad_t         -0.0085762  0.0045374 -1.8901 0.05985 .
## Anios_de_contrato_t -0.0124590  0.0111835 -1.1141 0.26628
## X_WAR_2_t       0.0056214  0.0051116  1.0997 0.27246
## X_WAR_2_t_1     0.0086097  0.0056811  1.5155 0.13086
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Starting pitcher

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_fielder_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_s <- paste(vars, stat_fielder_t[[i]],
    sep = '+')
  formula <- paste(base_vars_s,
    stat_fielder_t_1[[i]],
    sep = " + ")
}
```

```

s_m_random_i <- plm(formula, data = starting_first_two,
                     model = "random",
                     index = c("id", "Anio_ref"))

my_lm_cluster <- coeftest(s_m_random_i,
                         vcov = vcovHC(s_m_random_i,
                                       type = "HC1",
                                       cluster = "group"))

print(my_lm_cluster)
}

```

```

##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.6912e-01  2.8811e-01  0.9341  0.35244
## Edad_t        -7.5795e-03  8.6761e-03 -0.8736  0.38437
## Anios_de_contrato_t -3.7593e-04  1.2828e-02 -0.0293  0.97668
## X_Bateos_2_t    -2.1870e-04  1.0995e-04 -1.9891  0.04934 *
## X_Bateos_2_t_1  -3.0856e-05  8.9298e-05 -0.3455  0.73040
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.32810444  0.27067359  1.2122  0.2282
## Edad_t        -0.00915632  0.00814622 -1.1240  0.2636
## Anios_de_contrato_t -0.01536196  0.01298811 -1.1828  0.2396
## X_Bateos_t      0.00209296  0.00266654  0.7849  0.4343
## X_Bateos_t_1    -0.00027146  0.00125473 -0.2163  0.8291
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.9630e-01  2.8697e-01  1.0325  0.3042
## Edad_t        -8.1454e-03  8.6716e-03 -0.9393  0.3498
## Anios_de_contrato_t -9.0297e-03  1.1004e-02 -0.8206  0.4138
## X_Carreras_2_t  -1.6406e-04  2.1023e-04 -0.7804  0.4370
## X_Carreras_2_t_1  3.2879e-05  1.3042e-04  0.2521  0.8015
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.9146e-01  2.9373e-01  0.9923  0.3234
## Edad_t        -8.0016e-03  8.8965e-03 -0.8994  0.3705
## Anios_de_contrato_t -9.6822e-03  1.1510e-02 -0.8412  0.4022
## X_Carreras_ganadas_2_t -7.3692e-05  2.5934e-04 -0.2842  0.7769
## X_Carreras_ganadas_2_t_1 1.4313e-06  1.4299e-04  0.0100  0.9920

```

```

##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2707853  0.2851592  0.9496  0.3445
## Edad_t           -0.0074328  0.0086112 -0.8632  0.3901
## Anios_de_contrato_t -0.0067231  0.0118477 -0.5675  0.5716
## X_Carreras_ganadas_t -0.0030392  0.0019461 -1.5617  0.1214
## X_Carreras_ganadas_t_1 0.0017362  0.0016131  1.0763  0.2843
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2865089  0.2865421  0.9999  0.3197
## Edad_t           -0.0079227  0.0086650 -0.9143  0.3627
## Anios_de_contrato_t -0.0093872  0.0123696 -0.7589  0.4496
## X_Carreras_t      -0.0012884  0.0020313 -0.6343  0.5273
## X_Carreras_t_1     0.0015758  0.0015137  1.0410  0.3003
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.8129e-01  2.9195e-01  0.9635  0.33755
## Edad_t           -7.5632e-03  8.9434e-03 -0.8457  0.39970
## Anios_de_contrato_t -1.1297e-02  1.0806e-02 -1.0455  0.29824
## X_Comando_2_t      3.0276e-03  5.0558e-03  0.5988  0.55059
## X_Comando_2_t_1    -3.9346e-06  2.2415e-06 -1.7553  0.08218 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.28258235  0.28853146  0.9794  0.3297
## Edad_t           -0.00725816  0.00899392 -0.8070  0.4215
## Anios_de_contrato_t -0.01425319  0.01119648 -1.2730  0.2059
## X_Comando_t       0.01577627  0.01607596  0.9814  0.3287
## X_Comando_t_1     -0.00036779  0.00025672 -1.4327  0.1550
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2827936  0.2783007  1.0161  0.3119
## Edad_t           -0.0084687  0.0084104 -1.0069  0.3163
## Anios_de_contrato_t -0.0079898  0.0120902 -0.6608  0.5102
## X_Control_2_t     -0.0849050  0.0559503 -1.5175  0.1322
## X_Control_2_t_1   -0.0780902  0.0175736 -4.4436 2.234e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```

##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2660143  0.2656391  1.0014  0.31897
## Edad_t           -0.0073230  0.0080434 -0.9104  0.36472
## Anios_de_contrato_t -0.0137250  0.0132992 -1.0320  0.30448
## X_Control_t       0.0406495  0.0361386  1.1248  0.26328
## X_Control_t_1     -0.0771624  0.0378826 -2.0369  0.04423 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2820150  0.2665449  1.0580  0.292512
## Edad_t           -0.0070391  0.0081440 -0.8643  0.389419
## Anios_de_contrato_t -0.0118111  0.0126208 -0.9358  0.351542
## X_Dominio_2_t     0.0179104  0.0314955  0.5687  0.570820
## X_Dominio_2_t_1    0.0546093  0.0197269  2.7683  0.006684 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2805554  0.2683234  1.0456  0.298199
## Edad_t           -0.0066398  0.0081691 -0.8128  0.418209
## Anios_de_contrato_t -0.0146115  0.0118947 -1.2284  0.222097
## X_Dominio_t       0.0202869  0.0203727  0.9958  0.321686
## X_Dominio_t_1     0.0617756  0.0226864  2.7230  0.007599 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2278407  0.2946128  0.7734  0.4411
## Edad_t           -0.0065427  0.0088067 -0.7429  0.4592
## Anios_de_contrato_t -0.0056394  0.0124369 -0.4534  0.6512
## X_ERA_2_t         0.0015741  0.0068832  0.2287  0.8196
## X_ERA_2_t_1       -0.0057526  0.0039866 -1.4430  0.1521
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2399940  0.2701055  0.8885  0.37633
## Edad_t           -0.0067819  0.0081050 -0.8368  0.40467
## Anios_de_contrato_t -0.0095341  0.0130422 -0.7310  0.46643

```

```

## X_ERA_t          0.0019385  0.0106459  0.1821  0.85587
## X_ERA_t_1        -0.0237141  0.0097233 -2.4389  0.01644 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.4348e-01 2.9375e-01  0.8289  0.4091
## Edad_t         -6.8848e-03  8.8438e-03 -0.7785  0.4381
## Anios_de_contrato_t -1.9934e-03 1.2327e-02 -0.1617  0.8719
## X_Inning_pitched_2_t -1.8990e-04 1.1591e-04 -1.6383  0.1044
## X_Inning_pitched_2_t_1 3.8544e-05 8.3444e-05  0.4619  0.6451
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.2644380  0.2945583  0.8977  0.3714
## Edad_t         -0.0074029  0.0088416 -0.8373  0.4044
## Anios_de_contrato_t -0.0081045  0.0130258 -0.6222  0.5352
## X_Inning_pitched_t -0.0010159  0.0013171 -0.7713  0.4423
## X_Inning_pitched_t_1 0.0014111  0.0013002  1.0852  0.2803
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.29344403  0.28530557  1.0285  0.3061
## Edad_t         -0.00801631  0.00862406 -0.9295  0.3548
## Anios_de_contrato_t -0.01002628  0.01018942 -0.9840  0.3274
## X_Losses_2_t     -0.00241946  0.00169348 -1.4287  0.1561
## X_Losses_2_t_1    0.00032617  0.00109048  0.2991  0.7655
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.2879572  0.2906373  0.9908  0.3241
## Edad_t         -0.0079136  0.0087802 -0.9013  0.3695
## Anios_de_contrato_t -0.0093620  0.0109634 -0.8539  0.3951
## X_Losses_t       -0.0050867  0.0056547 -0.8996  0.3705
## X_Losses_t_1     0.0014739  0.0045710  0.3224  0.7478
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.3285046  0.2926805  1.1224  0.2643
## Edad_t         -0.0090865  0.0088362 -1.0283  0.3062
## Anios_de_contrato_t -0.0103102  0.0112525 -0.9163  0.3617
## X_Saves_2_t      0.2673052  0.0611828  4.3690 2.985e-05 ***
## X_Saves_2_t_1    0.0127642  0.0077155  1.6544  0.1011

```

```

## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3308260  0.2926533  1.1304  0.2609
## Edad_t           -0.0091248  0.0088317 -1.0332  0.3039
## Anios_de_contrato_t -0.0104110  0.0112984 -0.9215  0.3590
## X_Saves_t         0.1541329  0.0378810  4.0689 9.274e-05 ***
## X_Saves_t_1       0.0297920  0.0203290  1.4655  0.1458
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.9431e-01  2.7679e-01  1.0633  0.2901
## Edad_t           -8.2506e-03  8.3011e-03 -0.9939  0.3226
## Anios_de_contrato_t -8.6852e-03  1.2812e-02 -0.6779  0.4993
## X_Strike_outs_2_t  -1.0863e-04  8.0875e-05 -1.3432  0.1821
## X_Strike_outs_2_t_1 1.5302e-04  1.5654e-04  0.9776  0.3306
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3153827  0.2923922  1.0786  0.2833
## Edad_t           -0.0086284  0.0087920 -0.9814  0.3287
## Anios_de_contrato_t -0.0160249  0.0128145 -1.2505  0.2139
## X_Strike_outs_t     0.0012596  0.0011858  1.0622  0.2906
## X_Strike_outs_t_1   0.0010244  0.0012698  0.8068  0.4217
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3224252  0.2878763  1.1200  0.26531
## Edad_t           -0.0088327  0.0086486 -1.0213  0.30951
## Anios_de_contrato_t -0.0126367  0.0120338 -1.0501  0.29613
## X_WAR_2_t         -0.0014146  0.0027978 -0.5056  0.61421
## X_WAR_2_t_1       0.0059827  0.0033249  1.7993  0.07489 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.28962881  0.30491537  0.9499  0.34440
## Edad_t           -0.00772565  0.00916424 -0.8430  0.40117
## Anios_de_contrato_t -0.01362838  0.01252955 -1.0877  0.27927

```

```

## X_WAR_t          0.00041382  0.00803030  0.0515  0.95900
## X_WAR_t_1        0.01803047  0.01036819  1.7390  0.08502 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.1522650  0.2676994  0.5688 0.570736
## Edad_t        -0.0042805  0.0080174 -0.5339 0.594561
## Anios_de_contrato_t -0.0106092  0.0138918 -0.7637 0.446793
## X_WHIP_2_t     -0.0061139  0.0142435 -0.4292 0.668642
## X_WHIP_2_t_1   -0.0417182  0.0130923 -3.1865 0.001907 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.2323351  0.2696547  0.8616 0.39091
## Edad_t        -0.0062829  0.0081718 -0.7689 0.44374
## Anios_de_contrato_t -0.0128373  0.0130247 -0.9856 0.32663
## X_WHIP_t       -0.0032829  0.0172197 -0.1907 0.84917
## X_WHIP_t_1     -0.0469181  0.0181299 -2.5879 0.01105 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.6719e-01  2.8477e-01  0.9383 0.3503
## Edad_t        -7.2612e-03  8.5942e-03 -0.8449 0.4001
## Anios_de_contrato_t -9.9432e-03  1.1479e-02 -0.8662 0.3884
## X_Walks_2_t     7.9553e-05  3.7100e-04  0.2144 0.8306
## X_Walks_2_t_1    3.0172e-04  2.9894e-04  1.0093 0.3152
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.30899083  0.30344573  1.0183 0.3109
## Edad_t        -0.00860319  0.00915087 -0.9402 0.3493
## Anios_de_contrato_t -0.01208439  0.01293826 -0.9340 0.3525
## X_Walks_t       0.00247662  0.00278607  0.8889 0.3761
## X_Walks_t_1     0.00045765  0.00274374  0.1668 0.8679
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.9995e-01  2.9147e-01  1.0291 0.3059

```



```
## Edad_t -8.2982e-03 8.7668e-03 -0.9465 0.3461
## Anios_de_contrato_t -9.3726e-03 1.1124e-02 -0.8426 0.4014
## X_Wins_2_t -3.8102e-05 1.2410e-03 -0.0307 0.9756
## X_Wins_2_t_1 -3.1645e-04 1.3542e-03 -0.2337 0.8157
##
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.2462880 0.2988161 0.8242 0.4117
## Edad_t -0.0068464 0.0089500 -0.7650 0.4460
## Anios_de_contrato_t -0.0039420 0.0131364 -0.3001 0.7647
## X_Wins_t -0.0073464 0.0057793 -1.2712 0.2065
## X_Wins_t_1 0.0013464 0.0049933 0.2696 0.7880
```

First Differences

Bateadores

Se obtendrán las estimaciones de las variables referentes a estadísticas deportivas sin controles

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_hitter_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_h <- paste(vars, stat_hitter_t[[i]],
    sep = '+')
  formula <- paste(base_vars_h,
    stat_hitter_t_1[[i]],
    sep = " + ")

  h_m_first_d_i <- plm(formula, data = hitter_first_two,
    model = "fd",
    index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(h_m_first_d_i,
    vcov = vcovHC(h_m_first_d_i,
      type = "HC1",
      cluster = "group"))

  print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.00039870 0.01330509 -0.0300 0.97614
## Edad_t 0.01052929 0.01205054 0.8738 0.38388
## Anios_de_contrato_t -0.01879901 0.00786844 -2.3892 0.01835 *
## X_At_bats_t 0.00084015 0.00068316 1.2298 0.22103
## X_At_bats_t_1 0.00074023 0.00079433 0.9319 0.35314
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```

##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -7.8986e-04 1.3343e-02 -0.0592 0.95289
## Edad_t         7.3174e-03 1.1996e-02  0.6100 0.54296
## Anios_de_contrato_t -1.8749e-02 8.3892e-03 -2.2349 0.02716 *
## X_At_bats_2_t    -5.1855e-06 2.5047e-05 -0.2070 0.83631
## X_At_bats_2_t_1  1.5147e-05 2.5103e-05  0.6034 0.54732
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -4.8112e-04 1.3401e-02 -0.0359 0.97142
## Edad_t         7.4724e-03 1.2064e-02  0.6194 0.53675
## Anios_de_contrato_t -1.8669e-02 8.1747e-03 -2.2838 0.02403 *
## X_Bateos_t     -3.3714e-05 8.8065e-04 -0.0383 0.96952
## X_Bateos_t_1    8.0567e-04 1.3359e-03  0.6031 0.54750
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -5.1582e-04 1.3525e-02 -0.0381 0.96964
## Edad_t         6.4528e-03 1.1467e-02  0.5627 0.57461
## Anios_de_contrato_t -1.7848e-02 8.1636e-03 -2.1862 0.03062 *
## X_Bateos_2_t   -1.1589e-04 9.7266e-05 -1.1915 0.23567
## X_Bateos_2_t_1  4.5830e-05 5.1368e-05  0.8922 0.37397
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0022234 0.0135203 -0.1644 0.86964
## Edad_t         0.0068838 0.0114705  0.6001 0.54948
## Anios_de_contrato_t -0.0188947 0.0083998 -2.2494 0.02619 *
## X_Bateos_promedio_t 0.0334968 0.0173046  1.9357 0.05511 .
## X_Bateos_promedio_t_1 0.0638094 0.0252869  2.5234 0.01285 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0026065 0.0136520 -0.1909 0.8489

```

```

## Edad_t          0.0082372  0.0113913  0.7231  0.4709
## Anios_de_contrato_t -0.0162616  0.0078171 -2.0803  0.0395 *
## X_Bateos_promedio_2_t -0.0422011  0.0473030 -0.8921  0.3740
## X_Bateos_promedio_2_t_1 0.0415027  0.0225153  1.8433  0.0676 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.00097696  0.01345555 -0.0726  0.94223
## Edad_t      0.00648973  0.01143275  0.5676  0.57127
## Anios_de_contrato_t -0.01824919  0.00798758 -2.2847  0.02398 *
## X_Dobles_t   -0.00070906  0.00282409 -0.2511  0.80216
## X_Dobles_t_1  0.00077446  0.00196078  0.3950  0.69352
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.00106144  0.01343026 -0.0790  0.93713
## Edad_t      0.00699237  0.01137763  0.6146  0.53993
## Anios_de_contrato_t -0.01771938  0.00843778 -2.1000  0.03769 *
## X_Dobles_2_t -0.00026982  0.00053438 -0.5049  0.61449
## X_Dobles_2_t_1  0.00035079  0.00019342  1.8136  0.07208 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.00083069  0.01337995 -0.0621  0.95059
## Edad_t      0.00740021  0.01239418  0.5971  0.55151
## Anios_de_contrato_t -0.01960440  0.00824126 -2.3788  0.01885 *
## X_Home_runs_t  0.00338473  0.00437739  0.7732  0.44081
## X_Home_runs_t_1  0.00191767  0.00325635  0.5889  0.55697
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.00162842  0.01344046 -0.1212  0.90376
## Edad_t      0.00887277  0.01186204  0.7480  0.45583
## Anios_de_contrato_t -0.01793978  0.00930903 -1.9271  0.05618 .
## X_Home_runs_2_t -0.00037169  0.00079043 -0.4702  0.63899
## X_Home_runs_2_t_1  0.00082707  0.00068030  1.2157  0.22632
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```

##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -3.9085e-05  1.3319e-02 -0.0029  0.99766
## Edad_t         1.0786e-02  1.2069e-02  0.8937  0.37316
## Anios_de_contrato_t -1.8923e-02  7.8794e-03 -2.4015  0.01776 *
## X_Juegos_iniciados_t  1.9662e-03  1.3316e-03  1.4766  0.14224
## X_Juegos_iniciados_t_1 1.4319e-03  1.4499e-03  0.9876  0.32521
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -3.9181e-04  1.3315e-02 -0.0294  0.97657
## Edad_t         8.5343e-03  1.2364e-02  0.6902  0.49129
## Anios_de_contrato_t -1.7587e-02  8.1371e-03 -2.1614  0.03253 *
## X_Juegos_iniciados_2_t  1.6974e-04  1.0821e-04  1.5686  0.11921
## X_Juegos_iniciados_2_t_1 7.9182e-05  1.0388e-04  0.7623  0.44731
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0026193  0.0135525 -0.1933  0.84705
## Edad_t         0.0078507  0.0114510  0.6856  0.49421
## Anios_de_contrato_t -0.0215425  0.0085026 -2.5336  0.01249 *
## X_Porcentaje_On_base_plus_slugging_t  0.0181720  0.0088641  2.0501  0.04240 *
## X_Porcentaje_On_base_plus_slugging_t_1 0.0504128  0.0221717  2.2737  0.02465 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value
## (Intercept)    0.00043862  0.01356527  0.0323
## Edad_t         0.00610454  0.01163373  0.5247
## Anios_de_contrato_t -0.01628499  0.00809900 -2.0107
## X_Porcentaje_On_base_plus_slugging_2_t -0.02142262  0.02121529 -1.0098
## X_Porcentaje_On_base_plus_slugging_2_t_1 0.01585966  0.00995167  1.5937
## Pr(>|t|)
## (Intercept)    0.97426
## Edad_t         0.60068
## Anios_de_contrato_t 0.04645 *
## X_Porcentaje_On_base_plus_slugging_2_t  0.31451
## X_Porcentaje_On_base_plus_slugging_2_t_1 0.11348
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```

##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      -0.0031285  0.0136303 -0.2295 0.818825
## Edad_t            0.0089688  0.0114547  0.7830 0.435085
## Anios_de_contrato_t -0.0219318  0.0083332 -2.6318 0.009536 **
## X_Porcentaje_on_base_t 0.0593262  0.0361038  1.6432 0.102793
## X_Porcentaje_on_base_t_1 0.0929066  0.0317643  2.9249 0.004077 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      -0.0030040  0.0135648 -0.2215 0.82509
## Edad_t            0.0096687  0.0115088  0.8401 0.40241
## Anios_de_contrato_t -0.0195404  0.0088341 -2.2119 0.02875 *
## X_Porcentaje_on_base_2_t 0.1255457  0.0491548  2.5541 0.01182 *
## X_Porcentaje_on_base_2_t_1 0.0264335  0.0233950  1.1299 0.26064
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.00011286  0.01333590  0.0085 0.99326
## Edad_t            0.00588812  0.01169959  0.5033 0.61564
## Anios_de_contrato_t -0.02141317  0.00895183 -2.3920 0.01821 *
## X_Porcentaje_slugging_t -0.00332606  0.01695823 -0.1961 0.84482
## X_Porcentaje_slugging_t_1 0.05667341  0.03050013  1.8581 0.06545 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      -0.0013348  0.0134930 -0.0989 0.92135
## Edad_t            0.0077249  0.0117742  0.6561 0.51295
## Anios_de_contrato_t -0.0161267  0.0079840 -2.0199 0.04548 *
## X_Porcentaje_slugging_2_t -0.0338712  0.0307929 -1.1000 0.27341
## X_Porcentaje_slugging_2_t_1 0.0141248  0.0153734  0.9188 0.35994
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      -0.00025561  0.01339027 -0.0191 0.98480

```

```

## Edad_t          0.00815856  0.01165962  0.6997  0.48537
## Anios_de_contrato_t -0.01774712  0.00814057 -2.1801  0.03108 *
## X_Runs_batted_in_t -0.00022815  0.00145852 -0.1564  0.87595
## X_Runs_batted_in_t_1 0.00268434  0.00137025  1.9590  0.05229 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -1.3271e-03  1.3483e-02 -0.0984  0.92175
## Edad_t          7.1167e-03  1.2155e-02  0.5855  0.55924
## Anios_de_contrato_t -1.8559e-02  8.0361e-03 -2.3095  0.02252 *
## X_Runs_batted_in_2_t  7.0240e-05  1.7360e-04  0.4046  0.68645
## X_Runs_batted_in_2_t_1 8.4139e-05  2.1056e-04  0.3996  0.69012
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0011546  0.0134458 -0.0859  0.93170
## Edad_t          0.0066751  0.0117764  0.5668  0.57183
## Anios_de_contrato_t -0.0172740  0.0081782 -2.1122  0.03661 *
## X_Triples_t      0.0002539  0.0136728  0.0186  0.98521
## X_Triples_t_1     0.0057060  0.0134904  0.4230  0.67303
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0012694  0.0134239 -0.0946  0.92481
## Edad_t          0.0066299  0.0117373  0.5649  0.57316
## Anios_de_contrato_t -0.0167722  0.0080636 -2.0800  0.03952 *
## X_Triples_2_t    0.0023364  0.0040376  0.5787  0.56384
## X_Triples_2_t_1   0.0036034  0.0050810  0.7092  0.47950
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.00026104  0.01324576 -0.0197  0.984308
## Edad_t          0.00300219  0.01077762  0.2786  0.781034
## Anios_de_contrato_t -0.02360369  0.00874197 -2.7000  0.007871 **
## X_WAR_t         0.01985352  0.00723128  2.7455  0.006912 **
## X_WAR_t_1       0.00786302  0.00929608  0.8458  0.399219
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.00046004  0.01326898 -0.0347  0.97240
## Edad_t         0.00512917  0.01030954  0.4975  0.61968
## Anios_de_contrato_t -0.01905700  0.00998781 -1.9080  0.05863 .
## X_WAR_2_t       0.00345160  0.00478039  0.7220  0.47159
## X_WAR_2_t_1     0.00849170  0.00601246  1.4124  0.16027
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Starting pitcher

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_fieldier_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_s <- paste(vars, stat_fieldier_t[[i]],
                        sep = '+')
  formula <- paste(base_vars_s,
                   stat_fieldier_t_1[[i]],
                   sep = " + ")

  s_m_first_d_i <- plm(formula, data = starting_first_two,
                       model = "fd",
                       index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(s_m_first_d_i,
                           vcov = vcovHC(s_m_first_d_i,
                                           type = "HC1",
                                           cluster = "group"))

  print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -2.2474e-02  2.9650e-02 -0.7580  0.4521
## Edad_t         6.3377e-03  2.2359e-02  0.2834  0.7780
## Anios_de_contrato_t 9.7343e-03  1.1211e-02  0.8683  0.3895
## X_Bateos_2_t    -1.0564e-04  8.4719e-05 -1.2469  0.2184
## X_Bateos_2_t_1   8.0993e-06  8.1626e-05  0.0992  0.9214
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.01824728  0.02887854 -0.6319  0.53041
## Edad_t         0.00498698  0.01861110  0.2680  0.78986
```

```

## Anios_de_contrato_t -0.01300192  0.01082773 -1.2008  0.23560
## X_Bateos_t          0.00527740  0.00202806  2.6022  0.01222 *
## X_Bateos_t_1        -0.00013532  0.00112231 -0.1206  0.90452
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -1.8218e-02  2.9791e-02 -0.6115  0.5437
## Edad_t         7.5603e-03  2.1527e-02  0.3512  0.7269
## Anios_de_contrato_t  3.7779e-03  1.1358e-02  0.3326  0.7408
## X_Carreras_2_t    2.1823e-05  1.3800e-04  0.1581  0.8750
## X_Carreras_2_t_1   1.6580e-04  1.3245e-04  1.2517  0.2166
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.02008389  0.03022958 -0.6644  0.5096
## Edad_t         0.00855365  0.02171462  0.3939  0.6954
## Anios_de_contrato_t  0.00457057  0.01154266  0.3960  0.6938
## X_Carreras_ganadas_2_t -0.00016102  0.00015044 -1.0703  0.2897
## X_Carreras_ganadas_2_t_1 0.00016373  0.00014434  1.1344  0.2622
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.01681119  0.02930273 -0.5737  0.56879
## Edad_t         0.01031170  0.02178904  0.4733  0.63814
## Anios_de_contrato_t  0.00324988  0.01133237  0.2868  0.77549
## X_Carreras_ganadas_t  0.00050726  0.00140614  0.3607  0.71984
## X_Carreras_ganadas_t_1 0.00385443  0.00144053  2.6757  0.01011 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.0172974  0.0292557 -0.5912  0.557072
## Edad_t         0.0115875  0.0211720  0.5473  0.586655
## Anios_de_contrato_t -0.0025282  0.0122148 -0.2070  0.836884
## X_Carreras_t     0.0027224  0.0014125  1.9273  0.059745 .
## X_Carreras_t_1    0.0038704  0.0014289  2.7088  0.009277 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)

```



```

## (Intercept)      -2.1883e-02  3.0708e-02 -0.7126  0.4795
## Edad_t           7.2192e-03  2.3727e-02  0.3043  0.7622
## Anios_de_contrato_t  5.4124e-03  1.0924e-02  0.4954  0.6225
## X_Comando_2_t     -1.1980e-04  4.6473e-03 -0.0258  0.9795
## X_Comando_2_t_1    2.5892e-07  1.6211e-06  0.1597  0.8738
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.02489729  0.03094175 -0.8047  0.4249
## Edad_t         0.01123362  0.02336241  0.4808  0.6328
## Anios_de_contrato_t -0.00101679  0.00906978 -0.1121  0.9112
## X_Comando_t     0.02228785  0.01903307  1.1710  0.2473
## X_Comando_t_1    0.00017243  0.00013074  1.3189  0.1933
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0251105  0.0317080 -0.7919  0.4322
## Edad_t         0.0090111  0.0217474  0.4144  0.6804
## Anios_de_contrato_t  0.0082005  0.0124655  0.6579  0.5137
## X_Control_2_t   -0.0692898  0.0537386 -1.2894  0.2033
## X_Control_2_t_1 -0.0346591  0.0156440 -2.2155  0.0314 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0246225  0.0305256 -0.8066  0.42378
## Edad_t         0.0113015  0.0210277  0.5375  0.59338
## Anios_de_contrato_t  0.0041515  0.0121585  0.3415  0.73422
## X_Control_t     -0.0086660  0.0275342 -0.3147  0.75430
## X_Control_t_1   -0.0648282  0.0338034 -1.9178  0.06097 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0206100  0.0301843 -0.6828  0.49795
## Edad_t         0.0070173  0.0211693  0.3315  0.74169
## Anios_de_contrato_t  0.0080994  0.0116998  0.6923  0.49204
## X_Dominio_2_t   -0.0092765  0.0227673 -0.4074  0.68545
## X_Dominio_2_t_1  0.0235601  0.0098859  2.3832  0.02108 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:

```

```

##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0195581  0.0311065  -0.6287   0.5324
## Edad_t         0.0054862  0.0226535   0.2422   0.8097
## Anios_de_contrato_t 0.0021309  0.0131508   0.1620   0.8719
## X_Dominio_t     0.0128469  0.0094006   1.3666   0.1780
## X_Dominio_t_1    0.0098192  0.0153910   0.6380   0.5265
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0157508  0.0293892  -0.5359   0.5944
## Edad_t         0.0099983  0.0208965   0.4785   0.6344
## Anios_de_contrato_t 0.0123856  0.0116582   1.0624   0.2933
## X_ERA_2_t       0.0046892  0.0074140   0.6325   0.5300
## X_ERA_2_t_1     -0.0033860  0.0050811  -0.6664   0.5083
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0189557  0.0291392  -0.6505   0.518395
## Edad_t         0.0068997  0.0194626   0.3545   0.724479
## Anios_de_contrato_t 0.0141945  0.0117303   1.2101   0.232056
## X_ERA_t         0.0213379  0.0077730   2.7451   0.008433 **
## X_ERA_t_1       -0.0121353  0.0064650  -1.8771   0.066466 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -2.1832e-02  3.0044e-02  -0.7267   0.4709
## Edad_t         7.7050e-03  2.1633e-02   0.3562   0.7232
## Anios_de_contrato_t 8.6773e-03  1.1942e-02   0.7266   0.4709
## X_Inning_pitched_2_t -8.4885e-05  7.6903e-05  -1.1038   0.2751
## X_Inning_pitched_2_t_1 3.3102e-05  7.6637e-05   0.4319   0.6677
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.01518268  0.03016578  -0.5033   0.61700
## Edad_t         0.00757715  0.02120253   0.3574   0.72235
## Anios_de_contrato_t 0.00530117  0.01244252   0.4261   0.67194
## X_Inning_pitched_t -0.00044010  0.00093392  -0.4712   0.63956
## X_Inning_pitched_t_1 0.00217701  0.00099988   2.1773   0.03431 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:

```

```

##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.02132044  0.03034751 -0.7025  0.4857
## Edad_t         0.00757972  0.02141974  0.3539  0.7250
## Anios_de_contrato_t 0.00539319  0.01185194  0.4550  0.6511
## X_Losses_2_t    0.00066212  0.00082303  0.8045  0.4250
## X_Losses_2_t_1  0.00013723  0.00084893  0.1616  0.8722
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0172023  0.0303753 -0.5663  0.5738
## Edad_t         0.0067643  0.0218015  0.3103  0.7577
## Anios_de_contrato_t 0.0027986  0.0123100  0.2273  0.8211
## X_Losses_t      0.0041286  0.0036915  1.1184  0.2688
## X_Losses_t_1    0.0036633  0.0042481  0.8623  0.3927
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0167602  0.0312955 -0.5355  0.5946945
## Edad_t         0.0051610  0.0223228  0.2312  0.8181215
## Anios_de_contrato_t 0.0040957  0.0121068  0.3383  0.7365847
## X_Saves_2_t     0.2658249  0.0718207  3.7012  0.0005436 ***
## X_Saves_2_t_1   0.0011196  0.0108789  0.1029  0.9184544
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0166866  0.0312323 -0.5343  0.5955691
## Edad_t         0.0053820  0.0223959  0.2403  0.8110909
## Anios_de_contrato_t 0.0040530  0.0120859  0.3354  0.7387921
## X_Saves_t       0.1780194  0.0450716  3.9497  0.0002504 ***
## X_Saves_t_1     -0.0066758  0.0244042 -0.2736  0.7855792
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -2.6406e-02  3.2257e-02 -0.8186  0.4170
## Edad_t         1.1463e-02  2.2361e-02  0.5126  0.6105
## Anios_de_contrato_t 1.3202e-02  1.4239e-02  0.9272  0.3584
## X_Strike_outs_2_t -7.1066e-05  5.0527e-05 -1.4065  0.1659
## X_Strike_outs_2_t_1 -1.1048e-04  1.0547e-04 -1.0475  0.3000
##
##
## t test of coefficients:

```

```

##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.02143124  0.03023719 -0.7088  0.48183
## Edad_t         0.00686860  0.02128497  0.3227  0.74830
## Anios_de_contrato_t -0.00333469  0.01353297 -0.2464  0.80639
## X_Strike_outs_t    0.00197656  0.00090969  2.1728  0.03466 *
## X_Strike_outs_t_1  0.00130415  0.00096141  1.3565  0.18116
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -2.0680e-02  2.9962e-02 -0.6902  0.4933
## Edad_t         7.5732e-03  2.1444e-02  0.3532  0.7255
## Anios_de_contrato_t 6.5819e-03  1.2360e-02  0.5325  0.5968
## X_WAR_2_t      -2.6096e-03  1.7200e-03 -1.5172  0.1357
## X_WAR_2_t_1     8.0641e-05  1.1258e-03  0.0716  0.9432
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0183453  0.0291253 -0.6299  0.5317
## Edad_t         0.0105984  0.0223460  0.4743  0.6374
## Anios_de_contrato_t 0.0067097  0.0124039  0.5409  0.5910
## X_WAR_t        -0.0088511  0.0061640 -1.4359  0.1574
## X_WAR_t_1       0.0138671  0.0084591  1.6393  0.1076
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0047758  0.0318588 -0.1499  0.8815
## Edad_t         0.0101991  0.0205419  0.4965  0.6218
## Anios_de_contrato_t 0.0097047  0.0110101  0.8814  0.3824
## X_WHIP_2_t     0.0128196  0.0110199  1.1633  0.2503
## X_WHIP_2_t_1   -0.0300027  0.0123674 -2.4260  0.0190 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)     0.0010226  0.0299134  0.0342  0.972868
## Edad_t          0.0040970  0.0195394  0.2097  0.834787
## Anios_de_contrato_t 0.0036304  0.0093897  0.3866  0.700697
## X_WHIP_t        0.0048397  0.0156351  0.3095  0.758224
## X_WHIP_t_1     -0.0478823  0.0178597 -2.6810  0.009972 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##

```

```
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.01972289  0.03005633  -0.6562  0.51477
## Edad_t          0.00995971  0.02107294   0.4726  0.63858
## Anios_de_contrato_t  0.00469744  0.01213649   0.3871  0.70039
## X_Walks_2_t      0.00059875  0.00028150   2.1270  0.03848 *
## X_Walks_2_t_1    0.00053421  0.00026356   2.0269  0.04813 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0190529  0.0292488  -0.6514  0.51783
## Edad_t          0.0114424  0.0210933   0.5425  0.58996
## Anios_de_contrato_t  0.0054720  0.0128271   0.4266  0.67154
## X_Walks_t       0.0057704  0.0021959   2.6278  0.01144 *
## X_Walks_t_1     0.0055372  0.0021579   2.5660  0.01340 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.02420915  0.03037226  -0.7971  0.4292
## Edad_t          0.00719271  0.02266250   0.3174  0.7523
## Anios_de_contrato_t  0.00846951  0.01343626   0.6303  0.5314
## X_Wins_2_t      -0.00068549  0.00112937  -0.6070  0.5467
## X_Wins_2_t_1    -0.00111707  0.00116333  -0.9602  0.3417
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0222580  0.0301906  -0.7372  0.4645
## Edad_t          0.0084883  0.0220681   0.3846  0.7022
## Anios_de_contrato_t  0.0087561  0.0140017   0.6254  0.5346
## X_Wins_t        -0.0035490  0.0046290  -0.7667  0.4469
## X_Wins_t_1      0.0010869  0.0033022   0.3291  0.7435
```

Después de dos años

Pooling

Bateadores

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_hitter_t_1)){
```

```

# run linear regression with grouped errors by country and robust errors
base_vars_h <- paste(vars, stat_hitter_t[[i]],
                     sep = '+')
formula <- paste(base_vars_h,
                 stat_hitter_t_1[[i]],
                 sep = " + ")

h_m_pooled_f <- plm(formula, data = hitter_remaining,
                    model = "pooling",
                    index = c("id", "Anio_ref"))

my_lm_cluster <- coeftest(h_m_pooled_f,
                         vcov = vcovHC(h_m_pooled_f,
                                       type = "HC1",
                                       cluster = "group"))

print(my_lm_cluster)
}

```

```

##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.24214570  0.14340928  1.6885  0.09490 .
## Edad_t        -0.00697259  0.00417084 -1.6717  0.09817 .
## Anios_de_contrato_t -0.01129787  0.02363186 -0.4781  0.63379
## X_At_bats_t      0.00252861  0.00181433  1.3937  0.16696
## X_At_bats_t_1     0.00048543  0.00163580  0.2968  0.76736
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.6694e-01  1.2551e-01  2.1268  0.03627 *
## Edad_t        -7.5800e-03  3.7026e-03 -2.0472  0.04365 *
## Anios_de_contrato_t -1.1798e-02  2.1303e-02 -0.5538  0.58112
## X_At_bats_2_t     1.8648e-04  1.0312e-04  1.8084  0.07400 .
## X_At_bats_2_t_1   -1.9052e-05  8.9360e-05 -0.2132  0.83166
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.2323236  0.1417367  1.6391  0.1048
## Edad_t        -0.0065582  0.0040547 -1.6174  0.1094
## Anios_de_contrato_t -0.0119811  0.0236348 -0.5069  0.6135
## X_Bateos_t      0.0043427  0.0041277  1.0521  0.2957
## X_Bateos_t_1     0.0011877  0.0037387  0.3177  0.7515
##

```

```

##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.27788279  0.12415836  2.2381  0.02777 *
## Edad_t           -0.00798361  0.00355404 -2.2463  0.02721 *
## Anios_de_contrato_t -0.01269252  0.02177479 -0.5829  0.56147
## X_Bateos_2_t       0.00078600  0.00044024  1.7854  0.07769 .
## X_Bateos_2_t_1     -0.00044288  0.00033798 -1.3104  0.19353
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1752195  0.0975989  1.7953  0.07608 .
## Edad_t           -0.0053790  0.0029972 -1.7947  0.07618 .
## Anios_de_contrato_t -0.0045333  0.0236737 -0.1915  0.84859
## X_Bateos_promedio_t -0.0628482  0.0557672 -1.1270  0.26285
## X_Bateos_promedio_t_1 0.0597427  0.0506986  1.1784  0.24185
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1310994  0.1128553  1.1617  0.2486
## Edad_t           -0.0040239  0.0034249 -1.1749  0.2432
## Anios_de_contrato_t -0.0040147  0.0242112 -0.1658  0.8687
## X_Bateos_promedio_2_t -0.1009211  0.0987749 -1.0217  0.3097
## X_Bateos_promedio_2_t_1 -0.0144138  0.0328460 -0.4388  0.6619
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1972685  0.0958677  2.0577  0.04261 *
## Edad_t           -0.0057918  0.0030252 -1.9146  0.05884 .
## Anios_de_contrato_t -0.0088927  0.0233752 -0.3804  0.70455
## X_Dobles_t        0.0049155  0.0095315  0.5157  0.60736
## X_Dobles_t_1      -0.0012414  0.0083708 -0.1483  0.88245
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.27232395  0.13149830  2.0709  0.04133 *
## Edad_t           -0.00761289  0.00367903 -2.0693  0.04149 *
## Anios_de_contrato_t -0.01342335  0.02343723 -0.5727  0.56830
## X_Dobles_2_t       0.00353946  0.00182614  1.9382  0.05584 .

```

```

## X_Dobles_2_t_1      -0.00077489  0.00195440 -0.3965  0.69272
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2334089  0.1188134  1.9645  0.05266 .
## Edad_t           -0.0059062  0.0033683 -1.7535  0.08304 .
## Anios_de_contrato_t -0.0203140  0.0232201 -0.8748  0.38407
## X_Home_runs_t      0.0192807  0.0109689  1.7578  0.08230 .
## X_Home_runs_t_1     0.0144507  0.0070218  2.0580  0.04258 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1710503  0.1163254  1.4704  0.14505
## Edad_t           -0.0051581  0.0034071 -1.5139  0.13367
## Anios_de_contrato_t -0.0163391  0.0260411 -0.6274  0.53202
## X_Home_runs_2_t    -0.0032363  0.0059139 -0.5472  0.58562
## X_Home_runs_2_t_1  -0.0024322  0.0014195 -1.7135  0.09019 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.23430233  0.14436426  1.6230  0.1082
## Edad_t           -0.00661155  0.00407238 -1.6235  0.1081
## Anios_de_contrato_t -0.01104256  0.02393170 -0.4614  0.6456
## X_Juegos_iniciados_t  0.00426691  0.00401868  1.0618  0.2913
## X_Juegos_iniciados_t_1 0.00036145  0.00313819  0.1152  0.9086
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      2.4270e-01  1.2956e-01  1.8733  0.06439 .
## Edad_t           -6.9015e-03  3.8388e-03 -1.7978  0.07568 .
## Anios_de_contrato_t -1.1187e-02  2.1924e-02 -0.5103  0.61115
## X_Juegos_iniciados_2_t  5.7943e-04  4.0173e-04  1.4423  0.15281
## X_Juegos_iniciados_2_t_1 4.4849e-06  4.0358e-04  0.0111  0.99116
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
##              Estimate Std. Error t value Pr(>|t|)

```



```

## (Intercept)                0.1762682  0.1120516  1.5731  0.1193
## Edad_t                    -0.0049066  0.0033925 -1.4463  0.1517
## Anios_de_contrato_t       -0.0074512  0.0242293 -0.3075  0.7592
## X_Porcentaje_On_base_plus_slugging_t -0.0123203  0.0380834 -0.3235  0.7471
## X_Porcentaje_On_base_plus_slugging_t_1 -0.0190045  0.0313400 -0.6064  0.5458
##
##
## t test of coefficients:
##
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                0.1654622  0.1130957  1.4630  0.1471
## Edad_t                    -0.0048631  0.0035332 -1.3764  0.1722
## Anios_de_contrato_t       -0.0059871  0.0236957 -0.2527  0.8011
## X_Porcentaje_On_base_plus_slugging_2_t -0.0289576  0.0329197 -0.8796  0.3815
## X_Porcentaje_On_base_plus_slugging_2_t_1 0.0011880  0.0238496  0.0498  0.9604
##
##
## t test of coefficients:
##
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                0.1667586  0.0988658  1.6867  0.09524 .
## Edad_t                    -0.0049931  0.0029875 -1.6713  0.09825 .
## Anios_de_contrato_t       -0.0029701  0.0242239 -0.1226  0.90270
## X_Porcentaje_on_base_t     -0.0847163  0.0538210 -1.5740  0.11911
## X_Porcentaje_on_base_t_1  0.0488775  0.0474334  1.0304  0.30566
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                0.1410771  0.1089284  1.2951  0.1987
## Edad_t                    -0.0041031  0.0032923 -1.2463  0.2160
## Anios_de_contrato_t       -0.0067361  0.0230528 -0.2922  0.7708
## X_Porcentaje_on_base_2_t   -0.0883501  0.0808636 -1.0926  0.2776
## X_Porcentaje_on_base_2_t_1 -0.0080599  0.0442358 -0.1822  0.8558
##
##
## t test of coefficients:
##
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                0.1594485  0.0989671  1.6111  0.1108
## Edad_t                    -0.0043230  0.0030099 -1.4363  0.1545
## Anios_de_contrato_t       -0.0068401  0.0229156 -0.2985  0.7660
## X_Porcentaje_slugging_t    -0.0235768  0.0495503 -0.4758  0.6354
## X_Porcentaje_slugging_t_1 -0.0511330  0.0341373 -1.4979  0.1378
##
##
## t test of coefficients:
##
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                0.1767530  0.1121381  1.5762  0.1186
## Edad_t                    -0.0052344  0.0035475 -1.4755  0.1437

```

```

## Anios_de_contrato_t      -0.0076875  0.0234294 -0.3281  0.7436
## X_Porcentaje_slugging_2_t  0.0080055  0.0531545  0.1506  0.8806
## X_Porcentaje_slugging_2_t_1 -0.0172583  0.0499396 -0.3456  0.7305
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2611868  0.1288229  2.0275  0.04567 *
## Edad_t           -0.0069274  0.0038469 -1.8008  0.07520 .
## Anios_de_contrato_t -0.0197268  0.0262360 -0.7519  0.45414
## X_Runs_batted_in_t  0.0086197  0.0048511  1.7769  0.07908 .
## X_Runs_batted_in_t_1 0.0038321  0.0046906  0.8170  0.41618
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.28309747  0.11527533  2.4558  0.01604 *
## Edad_t           -0.00803924  0.00338197 -2.3771  0.01964 *
## Anios_de_contrato_t -0.01444829  0.02203093 -0.6558  0.51367
## X_Runs_batted_in_2_t  0.00192986  0.00085317  2.2620  0.02619 *
## X_Runs_batted_in_2_t_1 -0.00046776  0.00054921 -0.8517  0.39672
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1589018  0.1004093  1.5825  0.1172
## Edad_t           -0.0046787  0.0028930 -1.6172  0.1094
## Anios_de_contrato_t -0.0087466  0.0253276 -0.3453  0.7307
## X_Triples_t       -0.0137415  0.0354947 -0.3871  0.6996
## X_Triples_t_1      0.0025855  0.0386770  0.0668  0.9469
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2064870  0.1197017  1.7250  0.08808 .
## Edad_t           -0.0057453  0.0035547 -1.6162  0.10966
## Anios_de_contrato_t -0.0073096  0.0215667 -0.3389  0.73548
## X_Triples_2_t      0.0176555  0.0187802  0.9401  0.34976
## X_Triples_2_t_1     0.0130386  0.0166108  0.7849  0.43462
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)

```

```
## (Intercept)          0.3290777  0.0912539  3.6062 0.0005176 ***
## Edad_t              -0.0082325  0.0029201 -2.8192 0.0059600 **
## Anios_de_contrato_t -0.0302712  0.0232437 -1.3023 0.1962381
## X_WAR_t              0.0602668  0.0214390  2.8111 0.0060997 **
## X_WAR_t_1            0.0156783  0.0215820  0.7265 0.4695127
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.2367866  0.0991931  2.3871  0.01915 *
## Edad_t         -0.0052839  0.0030152 -1.7524  0.08323 .
## Anios_de_contrato_t -0.0291834  0.0219240 -1.3311  0.18663
## X_WAR_2_t       0.0519701  0.0281928  1.8434  0.06868 .
## X_WAR_2_t_1     0.0075088  0.0038957  1.9275  0.05718 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Starting pitcher

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_fielder_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_s <- paste(vars, stat_fielder_t[[i]],
                        sep = '+')
  formula <- paste(base_vars_s,
                   stat_fielder_t_1[[i]],
                   sep = " + ")

  s_m_pooled_f <- plm(formula, data = starting_remaining,
                      model = "pooling",
                      index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(s_m_pooled_f,
                           vcov = vcovHC(s_m_pooled_f,
                                           type = "HC1",
                                           cluster = "group"))

  print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.27387115  0.15282723  1.7920  0.08357 .
## Edad_t         -0.00812352  0.00527359 -1.5404  0.13430
## Anios_de_contrato_t -0.05028157  0.02604348 -1.9307  0.06335 .
## X_Bateos_2_t     0.00010398  0.00024106  0.4313  0.66940
## X_Bateos_2_t_1   -0.00034461  0.00028755 -1.1985  0.24044
```

```

## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.27752233  0.14237070  1.9493  0.06099 .
## Edad_t           -0.00795850  0.00482918 -1.6480  0.11015
## Anios_de_contrato_t -0.04876920  0.02980181 -1.6365  0.11255
## X_Bateos_t        0.00077388  0.00260650  0.2969  0.76866
## X_Bateos_t_1      -0.00288620  0.00456162 -0.6327  0.53188
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.28739967  0.15797415  1.8193  0.07921 .
## Edad_t           -0.00845939  0.00545671 -1.5503  0.13192
## Anios_de_contrato_t -0.04754473  0.03031195 -1.5685  0.12761
## X_Carreras_2_t     0.00051787  0.00046855  1.1053  0.27814
## X_Carreras_2_t_1   -0.00043535  0.00050154 -0.8680  0.39250
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.28635072  0.15677835  1.8265  0.07809 .
## Edad_t           -0.00864956  0.00539399 -1.6036  0.11965
## Anios_de_contrato_t -0.04765743  0.02811635 -1.6950  0.10079
## X_Carreras_ganadas_2_t 0.00068317  0.00039232  1.7414  0.09222 .
## X_Carreras_ganadas_2_t_1 -0.00060971  0.00055803 -1.0926  0.28356
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2684573  0.1586625  1.6920  0.10137
## Edad_t           -0.0079209  0.0053680 -1.4756  0.15083
## Anios_de_contrato_t -0.0448485  0.0295248 -1.5190  0.13959
## X_Carreras_ganadas_t 0.0054666  0.0031189  1.7527  0.09022 .
## X_Carreras_ganadas_t_1 -0.0045330  0.0060394 -0.7506  0.45896
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##

```

```

##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2764199  0.1552958  1.7800  0.08556 .
## Edad_t           -0.0081787  0.0052724 -1.5512  0.13170
## Anios_de_contrato_t -0.0458831  0.0298488 -1.5372  0.13509
## X_Carreras_t       0.0054770  0.0032171  1.7025  0.09937 .
## X_Carreras_t_1     -0.0038626  0.0060628 -0.6371  0.52906
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1167768  0.1639698  0.7122  0.482041
## Edad_t           -0.0033123  0.0049564 -0.6683  0.509230
## Anios_de_contrato_t -0.0699071  0.0348886 -2.0037  0.054521 .
## X_Comando_2_t     -0.0660692  0.0204946 -3.2237  0.003123 **
## X_Comando_2_t_1    0.0271815  0.0180528  1.5057  0.142969
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1178980  0.1957846  0.6022  0.5517
## Edad_t           -0.0051672  0.0051484 -1.0036  0.3239
## Anios_de_contrato_t -0.0276118  0.0322433 -0.8564  0.3988
## X_Comando_t       -0.0097583  0.0460277 -0.2120  0.8336
## X_Comando_t_1     -0.0449686  0.0440582 -1.0207  0.3159
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3163297  0.1591350  1.9878  0.05635 .
## Edad_t           -0.0090503  0.0052330 -1.7295  0.09436 .
## Anios_de_contrato_t -0.0516608  0.0337352 -1.5314  0.13652
## X_Control_2_t      0.2170116  0.2557591  0.8485  0.40311
## X_Control_2_t_1    -0.1332349  0.3730200 -0.3572  0.72354
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3936329  0.2133649  1.8449  0.075291 .
## Edad_t           -0.0113305  0.0064478 -1.7573  0.089428 .
## Anios_de_contrato_t -0.0482553  0.0319846 -1.5087  0.142193
## X_Control_t        0.2095455  0.0635435  3.2977  0.002582 **
## X_Control_t_1     -0.0816495  0.0747849 -1.0918  0.283913
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```

##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2119849  0.1416698  1.4963  0.1454
## Edad_t           -0.0064009  0.0039376 -1.6256  0.1149
## Anios_de_contrato_t -0.0480945  0.0305304 -1.5753  0.1260
## X_Dominio_2_t     -0.0514992  0.0523170 -0.9844  0.3331
## X_Dominio_2_t_1    0.0440993  0.0495114  0.8907  0.3804
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2648941  0.1781665  1.4868  0.1479
## Edad_t           -0.0076204  0.0050592 -1.5063  0.1428
## Anios_de_contrato_t -0.0490237  0.0298363 -1.6431  0.1112
## X_Dominio_t       -0.0290911  0.1190533 -0.2444  0.8087
## X_Dominio_t_1     0.0425815  0.1045046  0.4075  0.6867
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3220634  0.1921680  1.6759  0.1045
## Edad_t           -0.0088330  0.0055990 -1.5776  0.1255
## Anios_de_contrato_t -0.0501237  0.0350407 -1.4304  0.1633
## X_ERA_2_t         0.0071533  0.0079932  0.8949  0.3782
## X_ERA_2_t_1       0.0039019  0.0191478  0.2038  0.8400
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2733374  0.1511339  1.8086  0.0809 .
## Edad_t           -0.0079611  0.0050324 -1.5820  0.1245
## Anios_de_contrato_t -0.0506494  0.0338143 -1.4979  0.1450
## X_ERA_t           -0.0101479  0.0148718 -0.6824  0.5004
## X_ERA_t_1         -0.0077460  0.0159950 -0.4843  0.6318
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.29786042  0.16171338  1.8419  0.07574 .
## Edad_t           -0.00874470  0.00536039 -1.6314  0.11363
## Anios_de_contrato_t -0.04784010  0.03978263 -1.2025  0.23888
## X_Inning_pitched_2_t  0.00015366  0.00025218  0.6093  0.54706
## X_Inning_pitched_2_t_1 -0.00011437  0.00035377 -0.3233  0.74880
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```

##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2789397  0.1395162  1.9993  0.05502 .
## Edad_t           -0.0082468  0.0047062 -1.7523  0.09028 .
## Anios_de_contrato_t -0.0435586  0.0300564 -1.4492  0.15800
## X_Inning_pitched_t  0.0018225  0.0025185  0.7237  0.47507
## X_Inning_pitched_t_1 -0.0043549  0.0042489 -1.0250  0.31385
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3210778  0.1730295  1.8556  0.0737 .
## Edad_t           -0.0090822  0.0054751 -1.6588  0.1079
## Anios_de_contrato_t -0.0513791  0.0280808 -1.8297  0.0776 .
## X_Losses_2_t       0.0070676  0.0062170  1.1368  0.2649
## X_Losses_2_t_1     -0.0039041  0.0051104 -0.7639  0.4511
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.245004  0.149279  1.6412  0.11155
## Edad_t           -0.006840  0.005079 -1.3467  0.18851
## Anios_de_contrato_t -0.047649  0.027223 -1.7504  0.09063 .
## X_Losses_t         0.020358  0.014252  1.4284  0.16385
## X_Losses_t_1       -0.018284  0.019635 -0.9312  0.35944
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2942730  0.2630140  1.1188  0.2724
## Edad_t           -0.0086221  0.0077206 -1.1168  0.2733
## Anios_de_contrato_t -0.0486436  0.0344697 -1.4112  0.1688
## X_Saves_2_t        0.0065842  0.1209517  0.0544  0.9570
## X_Saves_2_t_1      -0.0451471  0.4365830 -0.1034  0.9183
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2698307  0.2620900  1.0295  0.3117
## Edad_t           -0.0080089  0.0076521 -1.0466  0.3039
## Anios_de_contrato_t -0.0474297  0.0345510 -1.3727  0.1804

```

```

## X_Saves_t          0.0027833  0.0794746  0.0350  0.9723
## X_Saves_t_1        -0.0642244  0.1798262 -0.3571  0.7236
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.8724e-01  1.6345e-01  1.7573  0.08942 .
## Edad_t         -8.0975e-03  5.2446e-03 -1.5440  0.13344
## Anios_de_contrato_t -5.4313e-02  4.2034e-02 -1.2921  0.20652
## X_Strike_outs_2_t   2.1798e-04  2.2038e-04  0.9891  0.33079
## X_Strike_outs_2_t_1  4.0809e-05  3.3032e-04  0.1235  0.90253
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.29557472  0.15605772  1.8940  0.06824 .
## Edad_t         -0.00867888  0.00516633 -1.6799  0.10372
## Anios_de_contrato_t -0.04766730  0.03994015 -1.1935  0.24236
## X_Strike_outs_t   0.00040718  0.00301241  0.1352  0.89341
## X_Strike_outs_t_1 -0.00090964  0.00418890 -0.2172  0.82961
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.1716055  0.1217752  1.4092  0.16941
## Edad_t         -0.0072074  0.0045685 -1.5776  0.12550
## Anios_de_contrato_t  0.0112732  0.0504490  0.2235  0.82475
## X_WAR_2_t       0.0196773  0.0134240  1.4658  0.15345
## X_WAR_2_t_1     -0.0175222  0.0078300 -2.2378  0.03308 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.2915240  0.1518267  1.9201  0.06473 .
## Edad_t         -0.0083912  0.0052216 -1.6070  0.11888
## Anios_de_contrato_t -0.0443178  0.0464677 -0.9537  0.34810
## X_WAR_t         0.0428698  0.0278224  1.5408  0.13420
## X_WAR_t_1       -0.0109914  0.0348639 -0.3153  0.75482
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##

```



```

##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2909063  0.1712892  1.6983  0.1002
## Edad_t           -0.0085625  0.0053052 -1.6140  0.1174
## Anios_de_contrato_t -0.0473132  0.0329245 -1.4370  0.1614
## X_WHIP_2_t        0.0322087  0.0277674  1.1599  0.2555
## X_WHIP_2_t_1      -0.0272484  0.0341794 -0.7972  0.4318
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3067084  0.1652239  1.8563  0.07359 .
## Edad_t           -0.0087621  0.0051950 -1.6866  0.10240
## Anios_de_contrato_t -0.0512228  0.0317766 -1.6120  0.11780
## X_WHIP_t          0.0057351  0.0273336  0.2098  0.83528
## X_WHIP_t_1        -0.0233430  0.0262896 -0.8879  0.38189
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.28630797  0.15722480  1.8210  0.07894 .
## Edad_t           -0.00792412  0.00520129 -1.5235  0.13847
## Anios_de_contrato_t -0.05375673  0.03593360 -1.4960  0.14546
## X_Walks_2_t        0.00084128  0.00083479  1.0078  0.32190
## X_Walks_2_t_1      0.00037492  0.00074453  0.5036  0.61837
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.31026529  0.15588704  1.9903  0.05606 .
## Edad_t           -0.00868799  0.00514389 -1.6890  0.10195
## Anios_de_contrato_t -0.06176152  0.04321543 -1.4292  0.16364
## X_Walks_t          0.00827278  0.00489227  1.6910  0.10156
## X_Walks_t_1        -0.00033711  0.00746652 -0.0451  0.96430
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3084502  0.1538394  2.0050  0.05438 .
## Edad_t           -0.0086587  0.0050741 -1.7065  0.09861 .
## Anios_de_contrato_t -0.0564387  0.0438366 -1.2875  0.20811
## X_Wins_2_t         0.0018210  0.0022065  0.8253  0.41595
## X_Wins_2_t_1        0.0011397  0.0032914  0.3463  0.73165
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2970038  0.1664595  1.7842  0.08485 .
## Edad_t           -0.0086997  0.0055206 -1.5759  0.12591
## Anios_de_contrato_t -0.0495721  0.0376690 -1.3160  0.19849
## X_Wins_t          0.0094405  0.0097516  0.9681  0.34100
## X_Wins_t_1        -0.0087966  0.0162851 -0.5402  0.59321
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Efectos fijos

Bateadores

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_hitter_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_h <- paste(vars, stat_hitter_t[[i]],
                        sep = '+')
  formula <- paste(base_vars_h,
                   stat_hitter_t_1[[i]],
                   sep = " + ")

  h_m_fix_ef_f <- plm(formula, data = hitter_remaining,
                      model = "within",
                      index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(h_m_fix_ef_f,
                           vcov = vcovHC(h_m_fix_ef_f,
                                           type = "HC1",
                                           cluster = "group"))

  print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t           -0.0076952  0.0018848 -4.0827 0.0001899 ***
## Anios_de_contrato_t -0.0506248  0.0084844 -5.9668 4.086e-07 ***
## X_At_bats_t         0.0045864  0.0018980  2.4164 0.0199926 *
## X_At_bats_t_1        0.0016423  0.0019028  0.8631 0.3928588
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
```

```

##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -9.0384e-03  2.0359e-03 -4.4395 6.194e-05 ***
## Anios_de_contrato_t -4.6130e-02  7.0665e-03 -6.5281 6.231e-08 ***
## X_At_bats_2_t      2.6566e-04  9.4558e-05  2.8095 0.007437 **
## X_At_bats_2_t_1    1.1217e-05  1.3696e-04  0.0819 0.935106
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0086741  0.0016393 -5.2914 3.878e-06 ***
## Anios_de_contrato_t -0.0520794  0.0092594 -5.6245 1.283e-06 ***
## X_Bateos_t       0.0070291  0.0042167  1.6670 0.1028
## X_Bateos_t_1     0.0023013  0.0050693  0.4540 0.6521
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.00912547  0.00180220 -5.0635 8.219e-06 ***
## Anios_de_contrato_t -0.04746949  0.00521107 -9.1094 1.354e-11 ***
## X_Bateos_2_t     0.00084738  0.00039562  2.1419 0.03791 *
## X_Bateos_2_t_1   -0.00030034  0.00049584 -0.6057 0.54788
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0092939  0.0013273 -7.0022 1.277e-08 ***
## Anios_de_contrato_t -0.0438360  0.0087518 -5.0088 9.835e-06 ***
## X_Bateos_promedio_t -0.0380135  0.0726647 -0.5231 0.60357
## X_Bateos_promedio_t_1 0.0705055  0.0376427  1.8730 0.06787 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0081995  0.0020850 -3.9327 0.0003012 ***
## Anios_de_contrato_t -0.0422680  0.0141078 -2.9961 0.0045262 **
## X_Bateos_promedio_2_t -0.0682889  0.1303109 -0.5240 0.6029373
## X_Bateos_promedio_2_t_1 0.0695342  0.0309846  2.2442 0.0300235 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:

```

```

##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0086080  0.0028142 -3.0588 0.0038164 **
## Anios_de_contrato_t -0.0498719  0.0123336 -4.0436 0.0002143 ***
## X_Dobles_t     -0.0057510  0.0112907 -0.5094 0.6131048
## X_Dobles_t_1    0.0063846  0.0071998  0.8868 0.3801294
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.00795322  0.00079696 -9.9795 9.188e-13 ***
## Anios_de_contrato_t -0.05400387  0.00500699 -10.7857 8.271e-14 ***
## X_Dobles_2_t     0.00531894  0.00180892  2.9404 0.005258 **
## X_Dobles_2_t_1    0.00030958  0.00233320  0.1327 0.895061
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0084031  0.0014388 -5.8403 6.240e-07 ***
## Anios_de_contrato_t -0.0563540  0.0087409 -6.4472 8.171e-08 ***
## X_Home_runs_t     0.0300600  0.0078804  3.8145 0.0004313 ***
## X_Home_runs_t_1    0.0160715  0.0153687  1.0457 0.3015291
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0094586  0.0017510 -5.4019 2.689e-06 ***
## Anios_de_contrato_t -0.0470503  0.0127002 -3.7047 0.0005997 ***
## X_Home_runs_2_t     0.0057001  0.0022372  2.5479 0.0144949 *
## X_Home_runs_2_t_1    0.0056060  0.0056346  0.9949 0.3253409
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0078815  0.0015212 -5.1812 5.581e-06 ***
## Anios_de_contrato_t -0.0556737  0.0107637 -5.1723 5.746e-06 ***
## X_Juegos_iniciados_t  0.0087975  0.0059153  1.4872 0.1443
## X_Juegos_iniciados_t_1 0.0035728  0.0044607  0.8010 0.4276
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##

```

```

## t test of coefficients:
##
##
##          Estimate Std. Error t value Pr(>|t|)
## Edad_t      -0.00855336  0.00209158 -4.0894  0.000186 ***
## Anios_de_contrato_t -0.04863234  0.00658428 -7.3861  3.567e-09 ***
## X_Juegos_iniciados_2_t  0.00053105  0.00050383  1.0540  0.297754
## X_Juegos_iniciados_2_t_1  0.00028640  0.00062614  0.4574  0.649676
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##          Estimate Std. Error t value
## Edad_t      -0.00899294  0.00152923 -5.8807
## Anios_de_contrato_t -0.04601542  0.00870475 -5.2862
## X_Porcentaje_On_base_plus_slugging_t -0.00046125  0.04587747 -0.0101
## X_Porcentaje_On_base_plus_slugging_t_1 -0.01361708  0.02050244 -0.6642
##          Pr(>|t|)
## Edad_t      5.451e-07 ***
## Anios_de_contrato_t 3.945e-06 ***
## X_Porcentaje_On_base_plus_slugging_t  0.9920
## X_Porcentaje_On_base_plus_slugging_t_1  0.5101
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##          Estimate Std. Error t value Pr(>|t|)
## Edad_t      -0.0093137  0.0014609 -6.3752  1.04e-07
## Anios_de_contrato_t -0.0425501  0.0126370 -3.3671  0.00161
## X_Porcentaje_On_base_plus_slugging_2_t -0.0296111  0.0483124 -0.6129  0.54316
## X_Porcentaje_On_base_plus_slugging_2_t_1  0.0153331  0.0262193  0.5848  0.56174
##
## Edad_t      ***
## Anios_de_contrato_t **
## X_Porcentaje_On_base_plus_slugging_2_t
## X_Porcentaje_On_base_plus_slugging_2_t_1
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##          Estimate Std. Error t value Pr(>|t|)
## Edad_t      -0.0092959  0.0012209 -7.6142  1.679e-09 ***
## Anios_de_contrato_t -0.0430638  0.0114240 -3.7696  0.0004938 ***
## X_Porcentaje_on_base_t -0.0351045  0.0864704 -0.4060  0.6867774
## X_Porcentaje_on_base_t_1  0.0367108  0.0569713  0.6444  0.5227556
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##

```

```

## t test of coefficients:
##
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t      -0.0083325  0.0023214 -3.5894 0.0008441 ***
## Anios_de_contrato_t -0.0450433  0.0109800 -4.1023 0.0001787 ***
## X_Porcentaje_on_base_2_t -0.0520573  0.1150256 -0.4526 0.6531325
## X_Porcentaje_on_base_2_t_1 0.0876989  0.0585545  1.4977 0.1415083
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t      -0.0078624  0.0021476 -3.6610 0.000683 ***
## Anios_de_contrato_t -0.0442361  0.0083061 -5.3257 3.461e-06 ***
## X_Porcentaje_slugging_t 0.0099647  0.0668673  0.1490 0.882233
## X_Porcentaje_slugging_t_1 -0.0545986  0.0365494 -1.4938 0.142522
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t      -0.0101169  0.0018097 -5.5904 1.437e-06 ***
## Anios_de_contrato_t -0.0443417  0.0163375 -2.7141 0.009524 **
## X_Porcentaje_slugging_2_t -0.0448335  0.0952476 -0.4707 0.640231
## X_Porcentaje_slugging_2_t_1 0.0036141  0.1024015  0.0353 0.972009
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t      -0.0082310  0.0013116 -6.2754 1.453e-07 ***
## Anios_de_contrato_t -0.0595279  0.0132171 -4.5039 5.045e-05 ***
## X_Runs_batted_in_t 0.0099917  0.0059574  1.6772 0.1008
## X_Runs_batted_in_t_1 0.0036089  0.0056567  0.6380 0.5269
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t      -0.00910542  0.00179022 -5.0862 7.629e-06 ***
## Anios_de_contrato_t -0.04608076  0.00611639 -7.5340 2.188e-09 ***
## X_Runs_batted_in_2_t 0.00167467  0.00097048  1.7256 0.0916 .
## X_Runs_batted_in_2_t_1 0.00082333  0.00093110  0.8843 0.3815
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##

```

```
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0105451  0.0036276 -2.9069  0.005751 **
## Anios_de_contrato_t -0.0686812  0.0128599 -5.3407  3.294e-06 ***
## X_Triples_t     -0.0419917  0.0290689 -1.4446  0.155831
## X_Triples_t_1    0.0571094  0.0220527  2.5897  0.013060 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0114222  0.0020656 -5.5297  1.759e-06 ***
## Anios_de_contrato_t -0.0057697  0.0148961 -0.3873  0.700422
## X_Triples_2_t    0.0777851  0.0228630  3.4022  0.001455 **
## X_Triples_2_t_1  0.0342502  0.0059192  5.7863  7.473e-07 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.01151184  0.00050821 -22.6516 < 2.2e-16 ***
## Anios_de_contrato_t -0.05594513  0.01028816  -5.4378  2.387e-06 ***
## X_WAR_t        0.04132374  0.01498118   2.7584  0.008496 **
## X_WAR_t_1      0.00625239  0.01394034   0.4485  0.656037
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        -0.0091056  0.0027586 -3.3008  0.001944 **
## Anios_de_contrato_t -0.0591172  0.0116469 -5.0758  7.894e-06 ***
## X_WAR_2_t      0.0550941  0.0189067  2.9140  0.005643 **
## X_WAR_2_t_1    -0.0367168  0.0251903 -1.4576  0.152223
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Starting pitcher

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_fielder_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_s <- paste(vars, stat_fielder_t[[i]],
                        sep = '+')
  formula <- paste(base_vars_s,
```

```

stat_fieller_t_1[[i]],
sep = " + ")

s_m_fix_ef_f <- plm(formula, data = starting_remaining,
model = "within",
index = c("id", "Anio_ref"))

my_lm_cluster <- coeftest(s_m_fix_ef_f,
vcov = vcovHC(s_m_fix_ef_f,
type = "HC1",
cluster = "group"))

print(my_lm_cluster)
}

```

```

##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.10184738  0.02875136  3.5424 0.003609 **
## Anios_de_contrato_t 0.13292006  0.03993585  3.3283 0.005443 **
## X_Bateos_2_t      0.00015589  0.00016336  0.9543 0.357343
## X_Bateos_2_t_1    -0.00023950  0.00011145 -2.1489 0.051060 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.0762196  0.0335444  2.2722 0.04070 *
## Anios_de_contrato_t 0.0926817  0.0453812  2.0423 0.06195 .
## X_Bateos_t       0.0018319  0.0015261  1.2004 0.25140
## X_Bateos_t_1     0.0026246  0.0024535  1.0698 0.30418
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          1.0550e-01  3.2668e-02  3.2294 0.006584 **
## Anios_de_contrato_t 1.3668e-01  4.2561e-02  3.2114 0.006816 **
## X_Carreras_2_t    4.2092e-04  2.4063e-04  1.7492 0.103803
## X_Carreras_2_t_1  -4.3966e-05  5.0115e-04 -0.0877 0.931428
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.09946440  0.02714973  3.6636 0.002862 **

```



```

## Anios_de_contrato_t      0.13277071  0.03356906  3.9552 0.001645 **
## X_Carreras_ganadas_2_t   0.00040726  0.00034761  1.1716 0.262377
## X_Carreras_ganadas_2_t_1 -0.00043426  0.00021644 -2.0063 0.066085 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.0865933  0.0362063  2.3917 0.03259 *
## Anios_de_contrato_t 0.1110470  0.0440098  2.5232 0.02545 *
## X_Carreras_ganadas_t 0.0024457  0.0024531  0.9970 0.33697
## X_Carreras_ganadas_t_1 0.0025200  0.0036186  0.6964 0.49844
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.0876463  0.0431302  2.0321 0.06309 .
## Anios_de_contrato_t 0.1119149  0.0527986  2.1197 0.05385 .
## X_Carreras_t    0.0021844  0.0020003  1.0921 0.29463
## X_Carreras_t_1  0.0011199  0.0043469  0.2576 0.80072
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.0871519  0.0376431  2.3152 0.03758 *
## Anios_de_contrato_t 0.0899111  0.0598802  1.5015 0.15712
## X_Comando_2_t   -0.0084065  0.0157725 -0.5330 0.60304
## X_Comando_2_t_1  0.0108249  0.0101710  1.0643 0.30657
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.105805  0.023078  4.5848 0.0005117 ***
## Anios_de_contrato_t 0.130914  0.027564  4.7494 0.0003799 ***
## X_Comando_t     -0.032493  0.012085 -2.6886 0.0185929 *
## X_Comando_t_1   -0.019780  0.021775 -0.9084 0.3802190
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)

```

```

## Edad_t          0.069717    0.015602    4.4684 0.0006329 ***
## Anios_de_contrato_t 0.085131    0.018324    4.6460 0.0004578 ***
## X_Control_2_t      0.330059    0.029389   11.2305 4.608e-08 ***
## X_Control_2_t_1    -0.377467    0.058221   -6.4834 2.056e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.062417    0.017721    3.5223 0.003750 **
## Anios_de_contrato_t 0.087218    0.028104    3.1034 0.008391 **
## X_Control_t      0.077547    0.049289    1.5733 0.139659
## X_Control_t_1    -0.160155    0.062558   -2.5601 0.023734 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.0217102    0.0138513    1.5674 0.1410
## Anios_de_contrato_t 0.0173703    0.0193667    0.8969 0.3861
## X_Dominio_2_t     0.0120407    0.0070653    1.7042 0.1121
## X_Dominio_2_t_1   -0.1314676    0.0113011  -11.6332 3.03e-08 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          -0.0168265    0.0027253   -6.1742 3.355e-05 ***
## Anios_de_contrato_t -0.0254840    0.0034330   -7.4233 5.023e-06 ***
## X_Dominio_t       -0.0401033    0.0116213   -3.4508 0.004301 **
## X_Dominio_t_1     -0.1372470    0.0085606  -16.0324 6.057e-10 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.1087563    0.0257053    4.2309 0.0009815 ***
## Anios_de_contrato_t 0.1359645    0.0338868    4.0123 0.0014774 **
## X_ERA_2_t         -0.0082058    0.0031197   -2.6303 0.0207760 *
## X_ERA_2_t_1       -0.0052413    0.0102533   -0.5112 0.6177959
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##

```

```

##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.1031765  0.0291383  3.5409 0.003619 **
## Anios_de_contrato_t 0.1270737  0.0360755  3.5224 0.003749 **
## X_ERA_t       -0.0161650  0.0118563 -1.3634 0.195902
## X_ERA_t_1      0.0046865  0.0058999  0.7943 0.441261
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        8.9431e-02 3.8428e-02  2.3272 0.03675 *
## Anios_de_contrato_t 1.0256e-01 5.4394e-02  1.8854 0.08192 .
## X_Inning_pitched_2_t 1.4987e-04 1.7407e-04  0.8609 0.40488
## X_Inning_pitched_2_t_1 8.6613e-05 1.9276e-04  0.4493 0.66059
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.0996474  0.0371031  2.6857 0.01870 *
## Anios_de_contrato_t 0.1177096  0.0466497  2.5233 0.02545 *
## X_Inning_pitched_t  0.0016810  0.0016246  1.0347 0.31966
## X_Inning_pitched_t_1 0.0017357  0.0021626  0.8026 0.43663
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.10130025  0.04275506  2.3693 0.03398 *
## Anios_de_contrato_t 0.12746295  0.05841564  2.1820 0.04806 *
## X_Losses_2_t     -0.00082964  0.00379704 -0.2185 0.83044
## X_Losses_2_t_1   -0.00140874  0.00415437 -0.3391 0.73995
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.0802398  0.0331475  2.4207 0.03087 *
## Anios_de_contrato_t 0.0954926  0.0436373  2.1883 0.04750 *
## X_Losses_t       0.0079164  0.0065026  1.2174 0.24508
## X_Losses_t_1     0.0150663  0.0088196  1.7083 0.11134
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:

```

```

##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.096258   0.034490  2.7909 0.0152944 *
## Anios_de_contrato_t 0.118993   0.045557  2.6120 0.0215123 *
## X_Saves_2_t    0.067690   0.002877 23.5279 4.847e-12 ***
## X_Saves_2_t_1  0.242681   0.047779  5.0793 0.0002113 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.0957144   0.0349612  2.7377  0.01693 *
## Anios_de_contrato_t 0.1182385   0.0461451  2.5623  0.02364 *
## X_Saves_t      0.0425701   0.0042835  9.9381 1.934e-07 ***
## X_Saves_t_1    0.0712873   0.0390331  1.8263  0.09085 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.09064162  0.03999347  2.2664  0.04114 *
## Anios_de_contrato_t 0.10365722  0.05574731  1.8594  0.08575 .
## X_Strike_outs_2_t  0.00019310  0.00014280  1.3522  0.19938
## X_Strike_outs_2_t_1 0.00010171  0.00013920  0.7307  0.47793
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.0970128   0.0368384  2.6335  0.02065 *
## Anios_de_contrato_t 0.1077660   0.0461186  2.3367  0.03611 *
## X_Strike_outs_t    0.0016728   0.0015662  1.0681  0.30493
## X_Strike_outs_t_1  0.0018857   0.0019069  0.9889  0.34077
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.0981045   0.0424567  2.3107  0.03790 *
## Anios_de_contrato_t 0.1453774   0.0743166  1.9562  0.07228 .
## X_WAR_2_t       0.0466255   0.0074950  6.2208 3.113e-05 ***
## X_WAR_2_t_1     -0.0092628   0.0043374 -2.1356  0.05231 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##

```

```

## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.076275   0.040368   1.8895  0.08133 .
## Anios_de_contrato_t 0.071389   0.062489   1.1424  0.27388
## X_WAR_t        0.035141   0.017064   2.0593  0.06008 .
## X_WAR_t_1      0.015445   0.010072   1.5334  0.14915
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.09232436 0.02920105   3.1617 0.007501 **
## Anios_de_contrato_t 0.11344156 0.03716442   3.0524 0.009257 **
## X_WHIP_2_t     0.01401037 0.04028823   0.3478 0.733592
## X_WHIP_2_t_1   0.00088853 0.01624979   0.0547 0.957225
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.0937272   0.0260956   3.5917 0.003284 **
## Anios_de_contrato_t 0.1167507   0.0368252   3.1704 0.007376 **
## X_WHIP_t       0.0077175   0.0348623   0.2214 0.828242
## X_WHIP_t_1     0.0025537   0.0158485   0.1611 0.874466
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.09205084 0.03305240   2.7850 0.01547 *
## Anios_de_contrato_t 0.11577764 0.04483505   2.5823 0.02276 *
## X_Walks_2_t    0.00028308 0.00103375   0.2738 0.78851
## X_Walks_2_t_1 -0.00050225 0.00051344 -0.9782 0.34583
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t        0.0799025   0.0382679   2.0880 0.05704 .
## Anios_de_contrato_t 0.0873792   0.0588481   1.4848 0.16143
## X_Walks_t      0.0013049   0.0041214   0.3166 0.75656
## X_Walks_t_1    0.0044357   0.0040418   1.0974 0.29236
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##

```

```
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.10421695  0.03626075  2.8741  0.01304 *
## Anios_de_contrato_t 0.12709720  0.05192477  2.4477  0.02934 *
## X_Wins_2_t       0.00268020  0.00034537  7.7605 3.114e-06 ***
## X_Wins_2_t_1     -0.00068409  0.00231681 -0.2953  0.77245
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## Edad_t          0.1028979  0.0373438  2.7554  0.01637 *
## Anios_de_contrato_t 0.1170520  0.0484511  2.4159  0.03114 *
## X_Wins_t         0.0076714  0.0026176  2.9307  0.01170 *
## X_Wins_t_1       0.0039133  0.0095200  0.4111  0.68772
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Efectos aleatorios

Bateadores

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_hitter_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_h <- paste(vars, stat_hitter_t[[i]],
                        sep = '+')
  formula <- paste(base_vars_h,
                    stat_hitter_t_1[[i]],
                    sep = " + ")

  h_m_random_f <- plm(formula, data = hitter_remaining,
                       model = "random",
                       index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(h_m_random_f,
                            vcov = vcovHC(h_m_random_f,
                                           type = "HC1",
                                           cluster = "group"))

  print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.32953732  0.10151208  3.2463 0.001661 **
```

```

## Edad_t          -0.00889834  0.00298588 -2.9801 0.003735 **
## Anios_de_contrato_t -0.01800763  0.02215108 -0.8129 0.418468
## X_At_bats_t      0.00374913  0.00180940  2.0720 0.041223 *
## X_At_bats_t_1    0.00040715  0.00158079  0.2576 0.797355
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.5494e-01  9.3352e-02  3.8022 0.0002656 ***
## Edad_t        -9.6683e-03  2.6484e-03 -3.6506 0.0004459 ***
## Anios_de_contrato_t -1.7101e-02  1.9095e-02 -0.8956 0.3729510
## X_At_bats_2_t    2.3817e-04  9.2282e-05  2.5809 0.0115301 *
## X_At_bats_2_t_1  -3.2047e-05  9.0978e-05 -0.3522 0.7255060
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.33395671  0.09900186  3.3732 0.001111 **
## Edad_t        -0.00890694  0.00276668 -3.2194 0.001807 **
## Anios_de_contrato_t -0.01931165  0.02323393 -0.8312 0.408146
## X_Bateos_t     0.00617196  0.00356241  1.7325 0.086724 .
## X_Bateos_t_1    0.00072378  0.00362045  0.1999 0.842013
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.35672329  0.09364101  3.8095 0.0002590 ***
## Edad_t        -0.00971040  0.00259972 -3.7352 0.0003345 ***
## Anios_de_contrato_t -0.01803121  0.02034149 -0.8864 0.3778321
## X_Bateos_2_t    0.00091364  0.00038102  2.3979 0.0186288 *
## X_Bateos_2_t_1  -0.00042239  0.00032330 -1.3065 0.1948263
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.3171981  0.0927955  3.4182 0.0009609 ***
## Edad_t        -0.0089064  0.0026537 -3.3563 0.0011729 **
## Anios_de_contrato_t -0.0120535  0.0231805 -0.5200 0.6043962
## X_Bateos_promedio_t -0.0489183  0.0591948 -0.8264 0.4108405
## X_Bateos_promedio_t_1 0.0570422  0.0420607  1.3562 0.1785488
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```

##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2728502  0.0922532  2.9576 0.003991 **
## Edad_t           -0.0075456  0.0025686 -2.9376 0.004233 **
## Anios_de_contrato_t -0.0091208  0.0240742 -0.3789 0.705714
## X_Bateos_promedio_2_t -0.1016784  0.0976647 -1.0411 0.300715
## X_Bateos_promedio_2_t_1 -0.0013846  0.0338653 -0.0409 0.967480
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.31991718  0.09557553  3.3473 0.001207 **
## Edad_t           -0.00875188  0.00257033 -3.4050 0.001003 **
## Anios_de_contrato_t -0.01426031  0.02343556 -0.6085 0.544448
## X_Dobles_t        0.00209906  0.01045725  0.2007 0.841380
## X_Dobles_t_1      0.00089129  0.00716385  0.1244 0.901274
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3303220  0.0926121  3.5667 0.0005904 ***
## Edad_t           -0.0087031  0.0025133 -3.4628 0.0008314 ***
## Anios_de_contrato_t -0.0200499  0.0223417 -0.8974 0.3719731
## X_Dobles_2_t      0.0045398  0.0017152  2.6468 0.0096434 **
## X_Dobles_2_t_1    -0.0006903  0.0017851 -0.3867 0.6999133
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3281435  0.0950831  3.4511 0.0008636 ***
## Edad_t           -0.0080998  0.0025536 -3.1719 0.0020929 **
## Anios_de_contrato_t -0.0285387  0.0220205 -1.2960 0.1984017
## X_Home_runs_t     0.0248287  0.0092069  2.6967 0.0084069 **
## X_Home_runs_t_1    0.0151949  0.0071698  2.1193 0.0369154 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2848016  0.1035525  2.7503 0.007242 **

```



```

## Edad_t          -0.0079311  0.0028890 -2.7453 0.007345 **
## Anios_de_contrato_t -0.0197205  0.0248368 -0.7940 0.429354
## X_Home_runs_2_t    -0.0019997  0.0052285 -0.3825 0.703054
## X_Home_runs_2_t_1  -0.0020102  0.0017518 -1.1475 0.254317
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.32996471  0.10074111  3.2754 0.001516 **
## Edad_t           -0.00869701  0.00277694 -3.1319 0.002366 **
## Anios_de_contrato_t -0.01938854  0.02394761 -0.8096 0.420366
## X_Juegos_iniciados_t  0.00570075  0.00397622  1.4337 0.155239
## X_Juegos_iniciados_t_1 0.00037554  0.00342783  0.1096 0.913015
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.3486e-01  9.8503e-02  3.3995 0.001021 **
## Edad_t           -9.0710e-03  2.8554e-03 -3.1768 0.002061 **
## Anios_de_contrato_t -1.6899e-02  2.0305e-02 -0.8322 0.407553
## X_Juegos_iniciados_2_t  6.8246e-04  3.9473e-04  1.7289 0.087366 .
## X_Juegos_iniciados_2_t_1 3.0546e-06  4.2388e-04  0.0072 0.994267
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3162325  0.0965880  3.2740 0.001522
## Edad_t           -0.0084253  0.0027857 -3.0245 0.003273
## Anios_de_contrato_t -0.0128954  0.0234895 -0.5490 0.584422
## X_Porcentaje_On_base_plus_slugging_t -0.0078562  0.0407795 -0.1927 0.847682
## X_Porcentaje_On_base_plus_slugging_t_1 -0.0200445  0.0254564 -0.7874 0.433183
##
## (Intercept)          **
## Edad_t               **
## Anios_de_contrato_t
## X_Porcentaje_On_base_plus_slugging_t
## X_Porcentaje_On_base_plus_slugging_t_1
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3105659  0.0940218  3.3031 0.001389

```

```

## Edad_t -0.0084701 0.0028120 -3.0121 0.003397
## Anios_de_contrato_t -0.0108119 0.0236259 -0.4576 0.648361
## X_Porcentaje_On_base_plus_slugging_2_t -0.0383098 0.0365917 -1.0470 0.298021
## X_Porcentaje_On_base_plus_slugging_2_t_1 0.0038754 0.0213388 0.1816 0.856309
##
## (Intercept) **
## Edad_t **
## Anios_de_contrato_t
## X_Porcentaje_On_base_plus_slugging_2_t
## X_Porcentaje_On_base_plus_slugging_2_t_1
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.3127245 0.0961069 3.2539 0.001622 **
## Edad_t -0.0087004 0.0027190 -3.1998 0.001920 **
## Anios_de_contrato_t -0.0093191 0.0238694 -0.3904 0.697181
## X_Porcentaje_on_base_t -0.0695671 0.0618702 -1.1244 0.263934
## X_Porcentaje_on_base_t_1 0.0453874 0.0433228 1.0477 0.297699
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.2857697 0.0934362 3.0584 0.002957 **
## Edad_t -0.0077361 0.0025769 -3.0021 0.003499 **
## Anios_de_contrato_t -0.0125935 0.0230518 -0.5463 0.586250
## X_Porcentaje_on_base_2_t -0.0772752 0.0875613 -0.8825 0.379924
## X_Porcentaje_on_base_2_t_1 0.0058458 0.0423335 0.1381 0.890490
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.2890174 0.0869880 3.3225 0.001306 **
## Edad_t -0.0075521 0.0024399 -3.0952 0.002645 **
## Anios_de_contrato_t -0.0124268 0.0223748 -0.5554 0.580052
## X_Porcentaje_slugging_t -0.0117201 0.0543349 -0.2157 0.829726
## X_Porcentaje_slugging_t_1 -0.0534970 0.0297352 -1.7991 0.075468 .
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.3220291 0.1006425 3.1997 0.001920 **

```

```

## Edad_t -0.0088834 0.0031190 -2.8481 0.005487 **
## Anios_de_contrato_t -0.0128012 0.0232983 -0.5494 0.584106
## X_Porcentaje_slugging_2_t -0.0280342 0.0614759 -0.4560 0.649512
## X_Porcentaje_slugging_2_t_1 -0.0138174 0.0493888 -0.2798 0.780320
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.3444404 0.0937703 3.6732 0.000413 ***
## Edad_t -0.0088513 0.0027603 -3.2066 0.001879 **
## Anios_de_contrato_t -0.0260669 0.0259334 -1.0051 0.317614
## X_Runs_batted_in_t 0.0098791 0.0046911 2.1059 0.038094 *
## X_Runs_batted_in_t_1 0.0033240 0.0045484 0.7308 0.466868
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.35780132 0.09135878 3.9164 0.0001783 ***
## Edad_t -0.00975010 0.00259147 -3.7624 0.0003047 ***
## Anios_de_contrato_t -0.01771772 0.02012587 -0.8803 0.3810974
## X_Runs_batted_in_2_t 0.00209048 0.00073224 2.8549 0.0053813 **
## X_Runs_batted_in_2_t_1 -0.00026588 0.00056504 -0.4705 0.6391450
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.3242990 0.1045889 3.1007 0.002602 **
## Edad_t -0.0084933 0.0026574 -3.1961 0.001942 **
## Anios_de_contrato_t -0.0206795 0.0253187 -0.8168 0.416291
## X_Triples_t -0.0201481 0.0346037 -0.5823 0.561903
## X_Triples_t_1 0.0159653 0.0340838 0.4684 0.640662
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.3418229 0.0752776 4.5408 1.791e-05 ***
## Edad_t -0.0090555 0.0020840 -4.3452 3.756e-05 ***
## Anios_de_contrato_t -0.0103740 0.0179224 -0.5788 0.56420
## X_Triples_2_t 0.0303472 0.0239089 1.2693 0.20772
## X_Triples_2_t_1 0.0205257 0.0112432 1.8256 0.07134 .
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.4856719  0.0869775   5.5839 2.637e-07 ***
## Edad_t           -0.0123099  0.0022972  -5.3586 6.786e-07 ***
## Anios_de_contrato_t -0.0348751  0.0217791  -1.6013  0.112933
## X_WAR_t           0.0581104  0.0167771   3.4637  0.000829 ***
## X_WAR_t_1         0.0166902  0.0186356   0.8956  0.372933
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.3189679  0.0773488   4.1238 8.495e-05 ***
## Edad_t           -0.0072698  0.0023982  -3.0314  0.003207 **
## Anios_de_contrato_t -0.0324297  0.0201308  -1.6110  0.110812
## X_WAR_2_t         0.0581931  0.0232981   2.4978  0.014379 *
## X_WAR_2_t_1       0.0065463  0.0042316   1.5470  0.125497
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Starting pitcher

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_fielder_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_s <- paste(vars, stat_fielder_t[[i]],
                        sep = '+')
  formula <- paste(base_vars_s,
                    stat_fielder_t_1[[i]],
                    sep = " + ")

  s_m_random_f <- plm(formula, data = starting_remaining,
                       model = "random",
                       index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(s_m_random_f,
                            vcov = vcovHC(s_m_random_f,
                                           type = "HC1",
                                           cluster = "group"))

  print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
```

```

## (Intercept)          0.12307945  0.39514947  0.3115  0.75767
## Edad_t              -0.00472262  0.01167943 -0.4044  0.68892
## Anios_de_contrato_t -0.02183033  0.01380936 -1.5808  0.12476
## X_Bateos_2_t         0.00021841  0.00011595  1.8837  0.06967 .
## X_Bateos_2_t_1       -0.00017064  0.00017140 -0.9956  0.32770
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.13263411  0.38967207  0.3404  0.73603
## Edad_t        -0.00519628  0.01133967 -0.4582  0.65020
## Anios_de_contrato_t -0.02229507  0.01476324 -1.5102  0.14182
## X_Bateos_t      0.00182058  0.00095807  1.9002  0.06738 .
## X_Bateos_t_1     0.00226195  0.00261950  0.8635  0.39495
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    7.0774e-02  3.8297e-01  0.1848  0.8547
## Edad_t        -3.1740e-03  1.1394e-02 -0.2786  0.7826
## Anios_de_contrato_t -1.6666e-02  1.5071e-02 -1.1059  0.2779
## X_Carreras_2_t   3.8980e-04  3.5745e-04  1.0905  0.2845
## X_Carreras_2_t_1 -6.7068e-05  3.6194e-04 -0.1853  0.8543
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.09812272  0.38315115  0.2561  0.79969
## Edad_t        -0.00432714  0.01135777 -0.3810  0.70599
## Anios_de_contrato_t -0.01465577  0.01261117 -1.1621  0.25466
## X_Carreras_ganadas_2_t 0.00060008  0.00023289  2.5767  0.01533 *
## X_Carreras_ganadas_2_t_1 -0.00031616  0.00032220 -0.9812  0.33459
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.1027760  0.3873464  0.2653  0.792630
## Edad_t        -0.0046199  0.0114564 -0.4033  0.689713
## Anios_de_contrato_t -0.0157873  0.0138544 -1.1395  0.263812
## X_Carreras_ganadas_t 0.0041313  0.0012466  3.3140  0.002476 **
## X_Carreras_ganadas_t_1 0.0018465  0.0030956  0.5965  0.555473
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##

```

```

##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1218921  0.3832380  0.3181  0.75272
## Edad_t           -0.0052773  0.0112620 -0.4686  0.64287
## Anios_de_contrato_t -0.0155438  0.0143517 -1.0831  0.28770
## X_Carreras_t       0.0034781  0.0013005  2.6745  0.01217 *
## X_Carreras_t_1     0.0027620  0.0032901  0.8395  0.40806
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1701363  0.3019579  0.5634  0.5775
## Edad_t           -0.0049972  0.0085980 -0.5812  0.5656
## Anios_de_contrato_t -0.0562565  0.0366220 -1.5361  0.1353
## X_Comando_2_t     -0.0437409  0.0228947 -1.9105  0.0660 .
## X_Comando_2_t_1   0.0227863  0.0186142  1.2241  0.2308
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)     -0.02331925  0.35850998 -0.0650  0.9486
## Edad_t           -0.00092631  0.01042007 -0.0889  0.9298
## Anios_de_contrato_t -0.01429028  0.01389270 -1.0286  0.3122
## X_Comando_t       -0.01849448  0.03023273 -0.6117  0.5455
## X_Comando_t_1     -0.01456761  0.02787696 -0.5226  0.6052
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1612313  0.3323345  0.4851  0.631216
## Edad_t           -0.0057672  0.0098141 -0.5877  0.561314
## Anios_de_contrato_t -0.0221943  0.0111191 -1.9960  0.055395 .
## X_Control_2_t     0.3892548  0.0824540  4.7209 5.508e-05 ***
## X_Control_2_t_1   -0.3912245  0.1166877 -3.3527  0.002239 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1482385  0.2957800  0.5012  0.62003
## Edad_t           -0.0054896  0.0084730 -0.6479  0.52215
## Anios_de_contrato_t -0.0141540  0.0179894 -0.7868  0.43778
## X_Control_t       0.1254787  0.0515745  2.4330  0.02138 *

```

```

## X_Control_t_1      -0.1613375  0.0765752 -2.1069  0.04389 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.326951   0.380094  0.8602  0.39674
## Edad_t           -0.011247   0.010829 -1.0386  0.30759
## Anios_de_contrato_t -0.027075   0.017459 -1.5507  0.13182
## X_Dominio_2_t     -0.011509   0.027008 -0.4261  0.67317
## X_Dominio_2_t_1   -0.098735   0.039947 -2.4716  0.01956 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.553627   0.420394  1.3169  0.1982
## Edad_t           -0.018260   0.011908 -1.5335  0.1360
## Anios_de_contrato_t -0.030334   0.017906 -1.6941  0.1010
## X_Dominio_t       -0.053680   0.059915 -0.8959  0.3777
## X_Dominio_t_1     -0.081151   0.058829 -1.3794  0.1783
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.07396313  0.42341449  0.1747  0.8625
## Edad_t           -0.00342083  0.01214978 -0.2816  0.7803
## Anios_de_contrato_t -0.01776504  0.01173738 -1.5135  0.1410
## X_ERA_2_t         0.00027211  0.00279100  0.0975  0.9230
## X_ERA_2_t_1       -0.00829977  0.01445101 -0.5743  0.5702
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.0856626  0.4067148  0.2106  0.83466
## Edad_t           -0.0034463  0.0120751 -0.2854  0.77736
## Anios_de_contrato_t -0.0206270  0.0112607 -1.8318  0.07728 .
## X_ERA_t           -0.0039964  0.0103974 -0.3844  0.70351
## X_ERA_t_1         0.0046655  0.0069371  0.6725  0.50657
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.12969550  0.40689628  0.3187  0.75221
## Edad_t           -0.00470227  0.01189343 -0.3954  0.69547

```

```

## Anios_de_contrato_t      -0.02708871  0.02450369 -1.1055  0.27803
## X_Inning_pitched_2_t     0.00022958  0.00010178  2.2557  0.03181 *
## X_Inning_pitched_2_t_1   0.00004709  0.00020086  0.2344  0.81629
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.11201293  0.38858768  0.2883  0.7752
## Edad_t           -0.00421943  0.01155592 -0.3651  0.7177
## Anios_de_contrato_t -0.02403350  0.01587698 -1.5137  0.1409
## X_Inning_pitched_t   0.00148067  0.00128132  1.1556  0.2573
## X_Inning_pitched_t_1 -0.00040748  0.00247646 -0.1645  0.8704
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1507070  0.3852273  0.3912  0.69850
## Edad_t           -0.0051499  0.0112571 -0.4575  0.65073
## Anios_de_contrato_t -0.0234052  0.0130197 -1.7977  0.08265 .
## X_Losses_2_t       0.0051381  0.0030168  1.7032  0.09923 .
## X_Losses_2_t_1     -0.0016513  0.0040925 -0.4035  0.68956
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1018867  0.3659835  0.2784  0.78269
## Edad_t           -0.0042303  0.0106664 -0.3966  0.69456
## Anios_de_contrato_t -0.0224281  0.0145665 -1.5397  0.13447
## X_Losses_t        0.0129178  0.0050161  2.5753  0.01538 *
## X_Losses_t_1      0.0053209  0.0127939  0.4159  0.68055
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1170773  0.4457986  0.2626  0.794697
## Edad_t           -0.0042391  0.0130533 -0.3248  0.747696
## Anios_de_contrato_t -0.0216419  0.0126196 -1.7149  0.097025 .
## X_Saves_2_t       0.0567548  0.0175595  3.2321  0.003056 **
## X_Saves_2_t_1     0.2160247  0.0724519  2.9816  0.005757 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:

```



```

##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1184130  0.4469459  0.2649  0.79293
## Edad_t          -0.0042672  0.0130721 -0.3264  0.74644
## Anios_de_contrato_t -0.0217180  0.0126772 -1.7132  0.09736 .
## X_Saves_t        0.0361442  0.0121710  2.9697  0.00593 **
## X_Saves_t_1      0.0666169  0.0370964  1.7958  0.08296 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      6.6834e-02  4.3073e-01  0.1552 0.8777676
## Edad_t          -2.6268e-03  1.2513e-02 -0.2099 0.8351933
## Anios_de_contrato_t -2.7429e-02  2.0848e-02 -1.3156 0.1986045
## X_Strike_outs_2_t  2.8417e-04  7.1089e-05  3.9974 0.0004029 ***
## X_Strike_outs_2_t_1 9.0627e-05  1.5322e-04  0.5915 0.5587929
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.0679244  0.4072997  0.1668  0.8687
## Edad_t          -0.0027953  0.0119785 -0.2334  0.8171
## Anios_de_contrato_t -0.0270071  0.0208938 -1.2926  0.2064
## X_Strike_outs_t    0.0012220  0.0014987  0.8153  0.4215
## X_Strike_outs_t_1  0.0012308  0.0020167  0.6103  0.5464
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2092764  0.3114704  0.6719  0.5070
## Edad_t          -0.0069752  0.0095006 -0.7342  0.4687
## Anios_de_contrato_t -0.0084537  0.0310221 -0.2725  0.7872
## X_WAR_2_t        0.0290399  0.0173798  1.6709  0.1055
## X_WAR_2_t_1      -0.0067623  0.0054830 -1.2333  0.2274
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.2743045  0.4109823  0.6674  0.50977
## Edad_t          -0.0076238  0.0118925 -0.6411  0.52652
## Anios_de_contrato_t -0.0442749  0.0262445 -1.6870  0.10233
## X_WAR_t          0.0486384  0.0154966  3.1386  0.00388 **
## X_WAR_t_1        0.0129192  0.0138170  0.9350  0.35750
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##

```

```

##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1546858  0.3715590  0.4163  0.6802
## Edad_t           -0.0054780  0.0108558 -0.5046  0.6176
## Anios_de_contrato_t -0.0219064  0.0140874 -1.5550  0.1308
## X_WHIP_2_t        0.0327486  0.0222471  1.4720  0.1518
## X_WHIP_2_t_1      -0.0011224  0.0182828 -0.0614  0.9515
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.14108567  0.39171844  0.3602  0.7213
## Edad_t           -0.00513275  0.01130295 -0.4541  0.6531
## Anios_de_contrato_t -0.01918003  0.01414874 -1.3556  0.1857
## X_WHIP_t          0.02254335  0.02331657  0.9668  0.3416
## X_WHIP_t_1        -0.00054972  0.01959004 -0.0281  0.9778
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      7.6514e-02  3.6401e-01  0.2102  0.83498
## Edad_t           -3.0549e-03  1.0681e-02 -0.2860  0.77691
## Anios_de_contrato_t -2.0571e-02  1.3249e-02 -1.5527  0.13135
## X_Walks_2_t       1.0312e-03  5.2939e-04  1.9479  0.06117 .
## X_Walks_2_t_1     6.3903e-05  5.5367e-04  0.1154  0.90891
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1337406  0.3653923  0.3660  0.71701
## Edad_t           -0.0044211  0.0107203 -0.4124  0.68307
## Anios_de_contrato_t -0.0362544  0.0213317 -1.6996  0.09992 .
## X_Walks_t         0.0038106  0.0030728  1.2401  0.22489
## X_Walks_t_1       0.0052638  0.0046155  1.1405  0.26343
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.0787297  0.4374634  0.1800  0.85843
## Edad_t           -0.0027746  0.0126251 -0.2198  0.82759
## Anios_de_contrato_t -0.0287396  0.0209624 -1.3710  0.18089
## X_Wins_2_t        0.0019410  0.0011250  1.7252  0.09513 .
## X_Wins_2_t_1      0.0012058  0.0018244  0.6609  0.51387
## ---

```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.1029242  0.4043501   0.2545   0.8009
## Edad_t           -0.0037294  0.0117939  -0.3162   0.7541
## Anios_de_contrato_t -0.0275815  0.0224066  -1.2310   0.2282
## X_Wins_t          0.0052708  0.0064369   0.8188   0.4196
## X_Wins_t_1        0.0022820  0.0087004   0.2623   0.7950
```

First Differences

Bateadores

Se obtendrán las estimaciones de las variables referentes a estadísticas deportivas sin controles

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_hitter_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_h <- paste(vars, stat_hitter_t[[i]],
                        sep = '+')
  formula <- paste(base_vars_h,
                    stat_hitter_t_1[[i]],
                    sep = " + ")

  h_m_first_d_f <- plm(formula, data = hitter_remaining,
                        model = "fd",
                        index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(h_m_first_d_f,
                            vcov = vcovHC(h_m_first_d_f,
                                           type = "HC1",
                                           cluster = "group"))

  print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.00978195  0.00887705   1.1019   0.2768
## Edad_t           -0.01919322  0.00080033 -23.9817 < 2.2e-16 ***
## Anios_de_contrato_t -0.05083764  0.01133419  -4.4853 5.553e-05 ***
## X_At_bats_t        0.00395151  0.00062356   6.3371 1.300e-07 ***
## X_At_bats_t_1      0.00144686  0.00090250   1.6032   0.1164
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
```

```

##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.5386e-03 1.1618e-02  0.1324  0.8953
## Edad_t          -1.7085e-02 9.7233e-04 -17.5713 < 2.2e-16 ***
## Anios_de_contrato_t -8.0184e-02 1.3603e-02 -5.8944 5.635e-07 ***
## X_At_bats_2_t      2.7547e-04 4.2572e-05  6.4706 8.351e-08 ***
## X_At_bats_2_t_1    -1.1235e-05 8.6220e-05 -0.1303  0.8969
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.00037202 0.01099264  0.0338 0.9731626
## Edad_t          -0.01805067 0.00115937 -15.5694 < 2.2e-16 ***
## Anios_de_contrato_t -0.07258976 0.01861362 -3.8998 0.0003411 ***
## X_Bateos_t        0.00608243 0.00185483  3.2792 0.0020964 **
## X_Bateos_t_1      0.00054894 0.00327734  0.1675 0.8677830
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.00250878 0.01109086  0.2262 0.8221409
## Edad_t          -0.01775997 0.00080473 -22.0694 < 2.2e-16 ***
## Anios_de_contrato_t -0.07708408 0.01278499 -6.0293 3.605e-07 ***
## X_Bateos_2_t      0.00086594 0.00021618  4.0057 0.0002472 ***
## X_Bateos_2_t_1    -0.00013406 0.00016206 -0.8272 0.4127989
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)     -0.00097123 0.01190068 -0.0816  0.9353
## Edad_t          -0.01763077 0.00099625 -17.6972 < 2.2e-16 ***
## Anios_de_contrato_t -0.07025963 0.01599058 -4.3938 7.413e-05 ***
## X_Bateos_promedio_t -0.01247441 0.02571689 -0.4851  0.6301
## X_Bateos_promedio_t_1 -0.02652433 0.00613043 -4.3267 9.153e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)     -0.00082350 0.01193767 -0.0690  0.94533
## Edad_t          -0.01649946 0.00038969 -42.3401 < 2e-16 ***
## Anios_de_contrato_t -0.06715402 0.02015869 -3.3313 0.00181 **
## X_Bateos_promedio_2_t -0.10174025 0.07489496 -1.3584 0.18158

```

```

## X_Bateos_promedio_2_t_1 0.01050578 0.02031819 0.5171 0.60782
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.00372725 0.00878695 -0.4242 0.6735995
## Edad_t      -0.01658295 0.00090594 -18.3047 < 2.2e-16 ***
## Anios_de_contrato_t -0.07199107 0.01731045 -4.1588 0.0001544 ***
## X_Dobles_t    -0.00518336 0.00422073 -1.2281 0.2262581
## X_Dobles_t_1   0.00126044 0.00420764 0.2996 0.7659900
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.00631964 0.01106906 0.5709 0.57109
## Edad_t      -0.01657322 0.00132547 -12.5037 9.535e-16 ***
## Anios_de_contrato_t -0.08349495 0.01308344 -6.3817 1.121e-07 ***
## X_Dobles_2_t 0.00630083 0.00076858 8.1980 2.966e-10 ***
## X_Dobles_2_t_1 0.00086765 0.00050299 1.7250 0.09188 .
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.0076598 0.0107205 0.7145 0.47887
## Edad_t      -0.0176240 0.0011540 -15.2720 < 2.2e-16 ***
## Anios_de_contrato_t -0.0756326 0.0170269 -4.4420 6.369e-05 ***
## X_Home_runs_t 0.0367181 0.0035365 10.3825 3.615e-13 ***
## X_Home_runs_t_1 0.0190911 0.0090328 2.1135 0.04054 *
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.0048558 0.0112545 -0.4315 0.6683423
## Edad_t      -0.0186966 0.0010569 -17.6908 < 2.2e-16 ***
## Anios_de_contrato_t -0.0651000 0.0183384 -3.5499 0.0009651 ***
## X_Home_runs_2_t 0.0080708 0.0024643 3.2751 0.0021208 **
## X_Home_runs_2_t_1 0.0052531 0.0031517 1.6668 0.1030050
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:

```

```

##
##               Estimate Std. Error  t value  Pr(>|t|)
## (Intercept)      0.0084615  0.0113074   0.7483  0.4584420
## Edad_t           -0.0176778  0.0012326 -14.3415 < 2.2e-16 ***
## Anios_de_contrato_t -0.0729745  0.0186468  -3.9135  0.0003273 ***
## X_Juegos_iniciados_t  0.0103312  0.0035108   2.9427  0.0052787 **
## X_Juegos_iniciados_t_1 0.0033639  0.0028797   1.1681  0.2493414
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error  t value  Pr(>|t|)
## (Intercept)      1.7542e-03  1.1662e-02   0.1504  0.8811512
## Edad_t           -1.7299e-02  1.0708e-03 -16.1544 < 2.2e-16 ***
## Anios_de_contrato_t -7.7531e-02  1.5494e-02  -5.0040  1.051e-05 ***
## X_Juegos_iniciados_2_t  6.4395e-04  1.5147e-04   4.2515  0.0001158 ***
## X_Juegos_iniciados_2_t_1 7.4059e-05  3.6322e-04   0.2039  0.8394215
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error  t value
## (Intercept)      -0.00415086  0.01106993  -0.3750
## Edad_t           -0.01722788  0.00096163 -17.9153
## Anios_de_contrato_t -0.07460251  0.01467274  -5.0844
## X_Porcentaje_On_base_plus_slugging_t  0.01761354  0.01565900   1.1248
## X_Porcentaje_On_base_plus_slugging_t_1 -0.05465494  0.00719119  -7.6003
##               Pr(>|t|)
## (Intercept)              0.7096
## Edad_t                   < 2.2e-16 ***
## Anios_de_contrato_t      8.090e-06 ***
## X_Porcentaje_On_base_plus_slugging_t    0.2671
## X_Porcentaje_On_base_plus_slugging_t_1 2.038e-09 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error  t value
## (Intercept)      -0.0043967  0.0121441  -0.3620
## Edad_t           -0.0170545  0.0014348 -11.8865
## Anios_de_contrato_t -0.0654626  0.0239593  -2.7322
## X_Porcentaje_On_base_plus_slugging_2_t -0.0315978  0.0247854  -1.2749
## X_Porcentaje_On_base_plus_slugging_2_t_1 -0.0298490  0.0070940  -4.2076
##               Pr(>|t|)
## (Intercept)              0.7191328
## Edad_t                   5.055e-15 ***
## Anios_de_contrato_t      0.0091622 **
## X_Porcentaje_On_base_plus_slugging_2_t  0.2093688

```

```

## X_Porcentaje_On_base_plus_slugging_2_t_1 0.0001327 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error  t value  Pr(>|t|)
## (Intercept)    -0.0011546  0.0116189  -0.0994  0.9213129
## Edad_t         -0.0174466  0.0011453 -15.2329 < 2.2e-16 ***
## Anios_de_contrato_t -0.0731741  0.0171561  -4.2652  0.0001109 ***
## X_Porcentaje_on_base_t -0.0037577  0.0346521  -0.1084  0.9141617
## X_Porcentaje_on_base_t_1 -0.0283763  0.0167173  -1.6974  0.0970162 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error  t value  Pr(>|t|)
## (Intercept)    -0.00245219  0.01122250  -0.2185  0.828093
## Edad_t         -0.01768083  0.00062954 -28.0855 < 2.2e-16 ***
## Anios_de_contrato_t -0.06716693  0.01972037  -3.4060  0.001463 **
## X_Porcentaje_on_base_2_t -0.01766869  0.05073081  -0.3483  0.729367
## X_Porcentaje_on_base_2_t_1 -0.05865099  0.00648661  -9.0419  2.076e-11 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error  t value  Pr(>|t|)
## (Intercept)    -0.00717947  0.00999722  -0.7181  0.4766
## Edad_t         -0.01482316  0.00064015 -23.1556 < 2.2e-16 ***
## Anios_de_contrato_t -0.07582673  0.01438244  -5.2722  4.381e-06 ***
## X_Porcentaje_slugging_t  0.01519829  0.02427189   0.6262  0.5346
## X_Porcentaje_slugging_t_1 -0.07484188  0.00940819  -7.9550  6.468e-10 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error  t value  Pr(>|t|)
## (Intercept)    -0.0030406  0.0113770  -0.2673  0.7905799
## Edad_t         -0.0175789  0.0015309 -11.4828 1.545e-14 ***
## Anios_de_contrato_t -0.0703371  0.0184976  -3.8025  0.0004573 ***
## X_Porcentaje_slugging_2_t -0.0476796  0.0420927  -1.1327  0.2637537
## X_Porcentaje_slugging_2_t_1 -0.0597955  0.0309709  -1.9307  0.0602895 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:

```

```

##
##               Estimate Std. Error  t value  Pr(>|t|)
## (Intercept)      0.0076790  0.0093735   0.8192 0.4172809
## Edad_t          -0.0176931  0.0010953 -16.1539 < 2.2e-16 ***
## Anios_de_contrato_t -0.0802223  0.0166902  -4.8065 1.99e-05 ***
## X_Runs_batted_in_t  0.0127214  0.0031083   4.0927 0.0001893 ***
## X_Runs_batted_in_t_1 0.0034916  0.0029878   1.1686 0.2491460
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error  t value  Pr(>|t|)
## (Intercept)      0.00231546  0.01112273   0.2082 0.8360997
## Edad_t          -0.01722916  0.00093111 -18.5040 < 2.2e-16 ***
## Anios_de_contrato_t -0.07945691  0.01335250  -5.9507 4.676e-07 ***
## X_Runs_batted_in_2_t  0.00185608  0.00044111   4.2077 0.0001327 ***
## X_Runs_batted_in_2_t_1 0.00073076  0.00037539   1.9467 0.0582828 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error  t value  Pr(>|t|)
## (Intercept)     -0.0044135  0.0101502  -0.4348 0.6659181
## Edad_t          -0.0133817  0.0014888  -8.9883 2.452e-11 ***
## Anios_de_contrato_t -0.0764534  0.0200525  -3.8127 0.0004436 ***
## X_Triples_t      -0.0562536  0.0069571  -8.0858 4.248e-10 ***
## X_Triples_t_1     0.0012700  0.0118679   0.1070 0.9152923
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error  t value  Pr(>|t|)
## (Intercept)     -0.00486322  0.01047180  -0.4644 0.6447518
## Edad_t          -0.01694754  0.00049091 -34.5227 < 2.2e-16 ***
## Anios_de_contrato_t -0.03538036  0.00873101  -4.0523 0.0002144 ***
## X_Triples_2_t     0.11590809  0.00541083  21.4215 < 2.2e-16 ***
## X_Triples_2_t_1    0.02929586  0.00240311  12.1908 2.208e-15 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error  t value  Pr(>|t|)
## (Intercept)      0.00141928  0.01090263   0.1302 0.897047
## Edad_t          -0.02658763  0.00052354 -50.7843 < 2.2e-16 ***
## Anios_de_contrato_t -0.07000814  0.01770334  -3.9545 0.000289 ***
## X_WAR_t          0.04685288  0.00584200   8.0200 5.247e-10 ***

```



```
## X_WAR_t_1          0.04963369  0.01153188   4.3040 9.825e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error  t value  Pr(>|t|)
## (Intercept)    0.0101065  0.0096496   1.0473   0.3009
## Edad_t         -0.0178840  0.0013254 -13.4928 < 2.2e-16 ***
## Anios_de_contrato_t -0.0446180  0.0089880  -4.9642 1.196e-05 ***
## X_WAR_2_t       0.0734625  0.0111338   6.5981 5.476e-08 ***
## X_WAR_2_t_1     -0.0146454  0.0087515  -1.6735   0.1017
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Starting pitcher

```
# loop over the variables in var_hitter_list
for (i in 1:length(stat_fielder_t_1)){
  # run linear regression with grouped errors by country and robust errors
  base_vars_s <- paste(vars, stat_fielder_t[[i]],
                        sep = '+')
  formula <- paste(base_vars_s,
                   stat_fielder_t_1[[i]],
                   sep = " + ")

  s_m_first_d_f <- plm(formula, data = starting_remaining,
                       model = "fd",
                       index = c("id", "Anio_ref"))

  my_lm_cluster <- coeftest(s_m_first_d_f,
                           vcov = vcovHC(s_m_first_d_f,
                                           type = "HC1",
                                           cluster = "group"))

  print(my_lm_cluster)
}
```

```
##
## t test of coefficients:
##
##              Estimate Std. Error t value  Pr(>|t|)
## (Intercept)   -2.1855e-03  6.3829e-04 -3.4240 0.0050413 **
## Edad_t        6.8256e-02  1.4888e-02  4.5847 0.0006273 ***
## Anios_de_contrato_t 9.3350e-02  2.0087e-02  4.6473 0.0005630 ***
## X_Bateos_2_t   -9.1519e-05  1.7576e-05 -5.2070 0.0002194 ***
## X_Bateos_2_t_1 -1.0647e-04  4.9125e-05 -2.1672 0.0510456 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
```

```

## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.00864906  0.00162025 -5.3381 0.0001770 ***
## Edad_t        0.04880553  0.01305886  3.7373 0.0028356 **
## Anios_de_contrato_t 0.06507518  0.01712166  3.8008 0.0025263 **
## X_Bateos_t    -0.00213807  0.00062180 -3.4385 0.0049080 **
## X_Bateos_t_1   0.00256788  0.00048575  5.2864 0.0001926 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -3.3203e-03  1.2329e-03 -2.6931 0.0195564 *
## Edad_t        5.5354e-02  1.1965e-02  4.6263 0.0005838 ***
## Anios_de_contrato_t 6.9251e-02  1.5836e-02  4.3729 0.0009075 ***
## X_Carreras_2_t -1.0966e-04  9.8761e-05 -1.1103 0.2886057
## X_Carreras_2_t_1 1.3822e-04  1.1413e-04  1.2111 0.2491587
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -2.2182e-03  6.0308e-04 -3.6781 0.0031595 **
## Edad_t        6.4028e-02  1.3511e-02  4.7389 0.0004811 ***
## Anios_de_contrato_t 8.3569e-02  1.7876e-02  4.6751 0.0005368 ***
## X_Carreras_ganadas_2_t -1.3129e-04  4.0514e-05 -3.2406 0.0070789 **
## X_Carreras_ganadas_2_t_1 -1.5369e-04  9.2298e-05 -1.6652 0.1217475
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.00543020  0.00142892 -3.8002 0.0025289 **
## Edad_t        0.05592920  0.01247132  4.4846 0.0007464 ***
## Anios_de_contrato_t 0.07064501  0.01507227  4.6871 0.0005258 ***
## X_Carreras_ganadas_t -0.00166257  0.00073749 -2.2544 0.0436532 *
## X_Carreras_ganadas_t_1 0.00212612  0.00077056  2.7592 0.0173047 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.00531436  0.00169363 -3.1379 0.0085660 **
## Edad_t        0.05103278  0.01048651  4.8665 0.0003873 ***
## Anios_de_contrato_t 0.06459193  0.01319116  4.8966 0.0003680 ***

```

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## X_Carreras_t      -0.00171775  0.00087802 -1.9564 0.0740970 .
## X_Carreras_t_1    0.00169732  0.00081582  2.0805 0.0595686 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.00125484  0.00029313 -4.2808 0.0010674 **
## Edad_t        0.06582026  0.01173119  5.6107 0.0001142 ***
## Anios_de_contrato_t 0.08999551  0.01659400  5.4234 0.0001541 ***
## X_Comando_2_t  -0.01345706  0.00308915 -4.3562 0.0009345 ***
## X_Comando_2_t_1 -0.00351531  0.00136118 -2.5825 0.0239850 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -1.5212e-03  9.8047e-05 -15.5154 2.639e-09 ***
## Edad_t        7.3706e-02  1.0130e-02  7.2762 9.790e-06 ***
## Anios_de_contrato_t 9.4133e-02  1.2879e-02  7.3090 9.361e-06 ***
## X_Comando_t    -3.4796e-02  2.1026e-03 -16.5492 1.257e-09 ***
## X_Comando_t_1  -1.5943e-02  1.2774e-03 -12.4810 3.117e-08 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.00139513  0.00022293  6.2583 4.202e-05 ***
## Edad_t        0.05055804  0.00529495  9.5483 5.887e-07 ***
## Anios_de_contrato_t 0.06260563  0.00644985  9.7065 4.936e-07 ***
## X_Control_2_t  0.29460830  0.00306191  96.2172 < 2.2e-16 ***
## X_Control_2_t_1 -0.32419008  0.02593657 -12.4993 3.066e-08 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    7.7973e-05  4.3616e-05  1.7877 0.09908 .
## Edad_t        3.9514e-02  4.1925e-03  9.4250 6.765e-07 ***
## Anios_de_contrato_t 6.0335e-02  5.2941e-03  11.3966 8.574e-08 ***
## X_Control_t    5.6028e-02  3.2655e-04  171.5779 < 2.2e-16 ***
## X_Control_t_1  -1.5503e-01  3.7240e-03 -41.6302 2.392e-14 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##

```

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## t test of coefficients:
##
##               Estimate Std. Error  t value Pr(>|t|)
## (Intercept)    -0.00396863  0.00018420  -21.5448 5.841e-11 ***
## Edad_t          0.01037941  0.00501557   2.0694 0.0607484 .
## Anios_de_contrato_t 0.00355062  0.00662113   0.5363 0.6015811
## X_Dominio_2_t   -0.00414124  0.00091669  -4.5176 0.0007047 ***
## X_Dominio_2_t_1 -0.12652901  0.00124249 -101.8352 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error  t value Pr(>|t|)
## (Intercept)    -0.00309960  0.00001508 -205.5470 < 2.2e-16 ***
## Edad_t         -0.01603159  0.00210018  -7.6334 6.057e-06 ***
## Anios_de_contrato_t -0.02520023  0.00270680  -9.3100 7.711e-07 ***
## X_Dominio_t     -0.04031797  0.00116511 -34.6043 2.161e-13 ***
## X_Dominio_t_1   -0.13765206  0.00038193 -360.4139 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error  t value Pr(>|t|)
## (Intercept)    -2.1087e-03  4.8655e-05 -43.3400 1.48e-14 ***
## Edad_t          8.2111e-02  1.6040e-02   5.1192 0.0002536 ***
## Anios_de_contrato_t 1.0586e-01  2.0526e-02   5.1574 0.0002380 ***
## X_ERA_2_t      -6.3645e-03  1.1716e-03  -5.4325 0.0001519 ***
## X_ERA_2_t_1    -2.3857e-03  1.6118e-03  -1.4801 0.1646139
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error  t value Pr(>|t|)
## (Intercept)    -0.00295174  0.00014265 -20.6927 9.369e-11 ***
## Edad_t          0.07396395  0.01275078   5.8007 8.464e-05 ***
## Anios_de_contrato_t 0.09452695  0.01601055   5.9040 7.208e-05 ***
## X_ERA_t        -0.01206274  0.00255375  -4.7235 0.0004940 ***
## X_ERA_t_1       0.00271765  0.00054145   5.0192 0.0002995 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -7.5376e-03  9.7576e-04 -7.7249 5.370e-06 ***
## Edad_t          5.9508e-02  1.4602e-02  4.0752 0.0015391 **
## Anios_de_contrato_t 6.7812e-02  1.7804e-02  3.8087 0.0024899 **

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## X_Inning_pitched_2_t  -2.0102e-04  3.1772e-05 -6.3270 3.792e-05 ***
## X_Inning_pitched_2_t_1  1.3761e-04  2.7859e-05  4.9394 0.0003424 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.00821006  0.00120465 -6.8153 1.862e-05 ***
## Edad_t          0.05849575  0.01482923  3.9446 0.001947 **
## Anios_de_contrato_t  0.07462680  0.01924853  3.8770 0.002200 **
## X_Inning_pitched_t  -0.00153543  0.00041515 -3.6985 0.003044 **
## X_Inning_pitched_t_1  0.00227336  0.00029446  7.7204 5.401e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.00248387  0.00152924 -1.6243 0.1302798
## Edad_t          0.06327398  0.01551123  4.0792 0.0015281 **
## Anios_de_contrato_t  0.08454656  0.01876127  4.5064 0.0007186 ***
## X_Losses_2_t     -0.00346647  0.00123204 -2.8136 0.0156447 *
## X_Losses_2_t_1    -0.00034495  0.00234020 -0.1474 0.8852635
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.0067410  0.0025539 -2.6395 0.021595 *
## Edad_t          0.0551498  0.0156798  3.5173 0.004245 **
## Anios_de_contrato_t  0.0714243  0.0200632  3.5600 0.003924 **
## X_Losses_t       -0.0057507  0.0034706 -1.6570 0.123417
## X_Losses_t_1      0.0088369  0.0040192  2.1987 0.048252 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -0.01051102  0.00052158 -20.1524 1.276e-10 ***
## Edad_t          0.06946285  0.01162546  5.9751 6.460e-05 ***
## Anios_de_contrato_t  0.08824329  0.01510505  5.8420 7.936e-05 ***
## X_Saves_2_t      0.09878397  0.00330331  29.9045 1.223e-12 ***
## X_Saves_2_t_1    -0.27256486  0.02540819 -10.7274 1.669e-07 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##

```

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## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.01123550 0.00093583 -12.0059 4.810e-08 ***
## Edad_t         0.07230620 0.01101803   6.5625 2.680e-05 ***
## Anios_de_contrato_t 0.09170984 0.01430408   6.4114 3.345e-05 ***
## X_Saves_t      0.06767307 0.00388010  17.4411 6.853e-10 ***
## X_Saves_t_1    -0.11058559 0.01637588  -6.7530 2.035e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -9.8480e-03 2.9502e-04 -33.3812 3.315e-13 ***
## Edad_t         6.2381e-02 1.2605e-02   4.9489 0.0003370 ***
## Anios_de_contrato_t 7.5202e-02 1.6514e-02   4.5539 0.0006616 ***
## X_Strike_outs_2_t -2.4995e-04 1.1052e-05 -22.6153 3.307e-11 ***
## X_Strike_outs_2_t_1 1.5560e-04 6.4863e-06  23.9886 1.653e-11 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.00882718 0.00074456 -11.8556 5.534e-08 ***
## Edad_t         0.05832358 0.01315296   4.4343 0.000815 ***
## Anios_de_contrato_t 0.06846384 0.01713199   3.9963 0.001774 **
## X_Strike_outs_t -0.00165834 0.00028608  -5.7967 8.517e-05 ***
## X_Strike_outs_t_1 0.00212644 0.00011790  18.0358 4.646e-10 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.00165870 0.00074282   2.2330 0.0453671 *
## Edad_t         0.07304151 0.01725744   4.2325 0.0011629 **
## Anios_de_contrato_t 0.12083365 0.02628218   4.5975 0.0006135 ***
## X_WAR_2_t      0.01127471 0.00382170   2.9502 0.0121402 *
## X_WAR_2_t_1    -0.00673568 0.00126457  -5.3265 0.0001804 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.0062261 0.0016881 -3.6881 0.003102 **
## Edad_t         0.0605400 0.0154812  3.9105 0.002070 **
## Anios_de_contrato_t 0.0735096 0.0202137  3.6366 0.003409 **

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## X_WAR_t          -0.0144877  0.0086059 -1.6835 0.118100
## X_WAR_t_1        0.0109168  0.0028277  3.8606 0.002266 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.0021901  0.0003043 -7.1970 1.091e-05 ***
## Edad_t         0.0456452  0.0119891  3.8072 0.002497 **
## Anios_de_contrato_t 0.0582045  0.0145759  3.9932 0.001783 **
## X_WHIP_2_t     0.0340448  0.0193898  1.7558 0.104587
## X_WHIP_2_t_1   -0.0030339  0.0041975 -0.7228 0.483653
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.00217041  0.00068976 -3.1466 0.008428 **
## Edad_t         0.04300495  0.01149033  3.7427 0.002808 **
## Anios_de_contrato_t 0.05916617  0.01604126  3.6884 0.003101 **
## X_WHIP_t       0.02856274  0.01193461  2.3933 0.033933 *
## X_WHIP_t_1     -0.00045817  0.00403914 -0.1134 0.911563
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -4.4225e-03  3.0587e-04 -14.4587 5.912e-09 ***
## Edad_t         7.4040e-02  1.4255e-02  5.1938 0.0002242 ***
## Anios_de_contrato_t 9.6184e-02  1.8533e-02  5.1898 0.0002257 ***
## X_Walks_2_t    -8.1582e-04  2.8607e-05 -28.5178 2.146e-12 ***
## X_Walks_2_t_1  -4.2127e-04  9.1375e-05  -4.6103 0.0006002 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.00970791  0.00117689 -8.2488 2.744e-06 ***
## Edad_t         0.05675213  0.01464267  3.8758 0.002205 **
## Anios_de_contrato_t 0.07466718  0.01997825  3.7374 0.002835 **
## X_Walks_t      -0.00459856  0.00092138 -4.9910 0.000314 ***
## X_Walks_t_1     0.00462114  0.00040769 11.3351 9.103e-08 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##

```

```

## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.00134115  0.00077446   1.7317 0.1089229
## Edad_t         0.06113004  0.01371177   4.4582 0.0007816 ***
## Anios_de_contrato_t 0.08129773  0.01862693   4.3645 0.0009210 ***
## X_Wins_2_t      0.00120715  0.00020893   5.7779 8.772e-05 ***
## X_Wins_2_t_1    -0.00060496  0.00034345  -1.7614 0.1036013
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.0054174  0.0013000  -4.1674 0.0013055 **
## Edad_t         0.0519122  0.0117347   4.4238 0.0008300 ***
## Anios_de_contrato_t 0.0597375  0.0151574   3.9412 0.0019588 **
## X_Wins_t       -0.0020041  0.0014257  -1.4057 0.1851811
## X_Wins_t_1      0.0066715  0.0012595   5.2970 0.0001893 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```