Gamlss Regular

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```r
#Quanto menor o AIC melhor.

source("dados_regular.R")
```

```
## -- Attaching core tidyverse packages ------------------------ tidyverse 2.0.0 --
## v dplyr     1.1.4     v readr     2.1.5
## v forcats   1.0.0     v stringr   1.5.1
## v lubridate 1.9.3     v tibble    3.2.1
## v purrr     1.0.2     v tidyr     1.3.1
## -- Conflicts ---------------------------------------- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
## Loading required package: splines
##
## Loading required package: gamlss.data
##
##
## Attaching package: 'gamlss.data'
##
##
## The following object is masked from 'package:datasets':
##
##     sleep
##
##
## Loading required package: gamlss.dist
##
## Loading required package: nlme
##
##
## Attaching package: 'nlme'
##
##
## The following object is masked from 'package:dplyr':
##
##     collapse
##
##
## Loading required package: parallel
##
##  **********   GAMLSS Version 5.4-22  **********
##
```

```
## For more on GAMLSS look at https://www.gamlss.com/
##
## Type gamlssNews() to see new features/changes/bug fixes.
##
##
## Loading required package: carData
##
##
## Attaching package: 'car'
##
##
## The following object is masked from 'package:dplyr':
##
##     recode
##
##
## The following object is masked from 'package:purrr':
##
##     some
##
##
## Loading required package: zoo
##
##
## Attaching package: 'zoo'
##
##
## The following objects are masked from 'package:base':
##
##     as.Date, as.Date.numeric
```

```
#Pacote que será utilizado para o gamlss
#install.packages("gamlss")
library(gamlss)

### Aplicação da modelagem

######## Beta ###############
gamlss.family(BE)
```

```
##
## GAMLSS Family: BE Beta
## Link function for mu    : logit
## Link function for sigma: logit
```

```
#### Modelo Completo família beta ####
modelo_gamlss <- gamlss(WINP ~ ., data = dados_regressao, family = BE)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1351.587
## GAMLSS-RS iteration 2: Global Deviance = -1750.471
## GAMLSS-RS iteration 3: Global Deviance = -1751.076
## GAMLSS-RS iteration 4: Global Deviance = -1751.076
```

```
modelo_gamlss
```

```
##
```

```
## Family:  c("BE", "Beta")
## Fitting method: RS()
##
## Call:  gamlss(formula = WINP ~ ., family = BE, data = dados_regressao)
##
## Mu Coefficients:
##                (Intercept)          TEAMBoston Celtics
##                  -1.745e+00                  -5.872e-02
##          TEAMBrooklyn Nets       TEAMCharlotte Bobcats
##                   2.832e-02                   3.030e-02
##      TEAMCharlotte Hornets           TEAMChicago Bulls
##                  -3.680e-02                   4.665e-02
##    TEAMCleveland Cavaliers        TEAMDallas Mavericks
##                   2.738e-02                  -7.466e-02
##         TEAMDenver Nuggets         TEAMDetroit Pistons
##                   7.957e-04                  -1.206e-01
##  TEAMGolden State Warriors         TEAMHouston Rockets
##                  -6.539e-02                   5.090e-02
##         TEAMIndiana Pacers             TEAMLA Clippers
##                  -1.953e-02                  -3.467e-02
##   TEAMLos Angeles Clippers      TEAMLos Angeles Lakers
##                  -7.768e-02                   3.365e-02
##      TEAMMemphis Grizzlies              TEAMMiami Heat
##                   5.077e-02                  -1.300e-02
##        TEAMMilwaukee Bucks  TEAMMinnesota Timberwolves
##                  -6.946e-02                  -1.912e-01
##        TEAMNew Jersey Nets     TEAMNew Orleans Hornets
##                  -1.403e-01                  -8.191e-02
##   TEAMNew Orleans Pelicans         TEAMNew York Knicks
##                  -1.439e-01                  -9.262e-02
##  TEAMOklahoma City Thunder           TEAMOrlando Magic
##                   8.419e-03                  -6.816e-02
##     TEAMPhiladelphia 76ers            TEAMPhoenix Suns
##                  -9.044e-02                  -2.098e-02
## TEAMPortland Trail Blazers        TEAMSacramento Kings
##                   4.528e-02                  -4.641e-02
##      TEAMSan Antonio Spurs         TEAMToronto Raptors
##                  -5.241e-02                  -5.236e-02
##              TEAMUtah Jazz      TEAMWashington Wizards
##                  -1.252e-01                  -6.334e-02
##                         PTS                         FGM
##                  -1.295e-01                   1.809e-01
##                         FGA                         FGP
##                   1.261e-02                   9.625e-02
##                        `3PM`                       `3PA`
##                   7.866e-02                   2.018e-02
##                        `3PP`                         FTM
##                   2.312e-02                   2.918e-01
##                         FTA                         FTP
##                  -1.361e-01                  -3.677e-02
##                        OREB                        DREB
##                   2.404e-01                   2.396e-01
##                         REB                         AST
##                  -2.071e-01                   8.921e-03
```

```
##                       TOV                       STL
##                -4.091e-02                 4.407e-02
##                       BLK                       BLKA
##                -3.007e-05                -2.126e-02
##                        PF                       PFD
##                -6.279e-03                 2.031e-02
##                 PlusMinus           Numero_temporada2
##                 1.127e-01                 2.159e-02
##          Numero_temporada3           Numero_temporada4
##                 2.208e-02                 4.392e-02
##          Numero_temporada5           Numero_temporada6
##                 7.634e-03                -6.390e-03
##          Numero_temporada7           Numero_temporada8
##                 1.586e-02                 7.494e-03
##          Numero_temporada9          Numero_temporada10
##                -3.938e-03                -2.007e-02
##         Numero_temporada11          Numero_temporada12
##                -1.917e-02                -9.704e-03
##         Numero_temporada13          Numero_temporada14
##                -4.290e-02                -4.930e-02
##         Numero_temporada15
##                -1.769e-02
## Sigma Coefficients:
## (Intercept)
##      -2.547
##
##  Degrees of Freedom for the fit: 70 Residual Deg. of Freedom   380
## Global Deviance:     -1751.08
##             AIC:     -1611.08
##             SBC:     -1323.43
```

```
coef(modelo_gamlss)
```

```
##                (Intercept)         TEAMBoston Celtics
##              -1.745346e+00              -5.872290e-02
##          TEAMBrooklyn Nets      TEAMCharlotte Bobcats
##               2.832024e-02               3.030115e-02
##      TEAMCharlotte Hornets          TEAMChicago Bulls
##              -3.679996e-02               4.665292e-02
##    TEAMCleveland Cavaliers       TEAMDallas Mavericks
##               2.738172e-02              -7.465550e-02
##         TEAMDenver Nuggets        TEAMDetroit Pistons
##               7.956701e-04              -1.205830e-01
##  TEAMGolden State Warriors        TEAMHouston Rockets
##              -6.539400e-02               5.090127e-02
##         TEAMIndiana Pacers            TEAMLA Clippers
##              -1.953105e-02              -3.467489e-02
##   TEAMLos Angeles Clippers     TEAMLos Angeles Lakers
##              -7.768011e-02               3.365045e-02
##      TEAMMemphis Grizzlies             TEAMMiami Heat
##               5.077486e-02              -1.300403e-02
##        TEAMMilwaukee Bucks TEAMMinnesota Timberwolves
##              -6.945829e-02              -1.912275e-01
##        TEAMNew Jersey Nets    TEAMNew Orleans Hornets
##              -1.402962e-01              -8.191034e-02
```

```
##   TEAMNew Orleans Pelicans        TEAMNew York Knicks
##               -1.439485e-01              -9.261671e-02
##  TEAMOklahoma City Thunder          TEAMOrlando Magic
##                8.418506e-03              -6.816116e-02
##     TEAMPhiladelphia 76ers           TEAMPhoenix Suns
##               -9.044110e-02              -2.098121e-02
## TEAMPortland Trail Blazers       TEAMSacramento Kings
##                4.527856e-02              -4.641321e-02
##      TEAMSan Antonio Spurs        TEAMToronto Raptors
##               -5.240623e-02              -5.235558e-02
##               TEAMUtah Jazz     TEAMWashington Wizards
##               -1.251667e-01              -6.334127e-02
##                         PTS                        FGM
##               -1.294621e-01               1.809039e-01
##                         FGA                        FGP
##                1.261381e-02               9.624725e-02
##                       `3PM`                      `3PA`
##                7.866082e-02               2.018384e-02
##                       `3PP`                        FTM
##                2.312406e-02               2.917692e-01
##                         FTA                        FTP
##               -1.360674e-01              -3.676968e-02
##                        OREB                       DREB
##                2.404499e-01               2.396342e-01
##                         REB                        AST
##               -2.071492e-01               8.921452e-03
##                         TOV                        STL
##               -4.090893e-02               4.407011e-02
##                         BLK                       BLKA
##               -3.007068e-05              -2.126365e-02
##                          PF                        PFD
##               -6.279338e-03               2.030577e-02
##                   PlusMinus          Numero_temporada2
##                1.127013e-01               2.159097e-02
##           Numero_temporada3          Numero_temporada4
##                2.208408e-02               4.392360e-02
##           Numero_temporada5          Numero_temporada6
##                7.634087e-03              -6.389642e-03
##           Numero_temporada7          Numero_temporada8
##                1.585872e-02               7.494271e-03
##           Numero_temporada9         Numero_temporada10
##               -3.937855e-03              -2.006763e-02
##          Numero_temporada11         Numero_temporada12
##               -1.917171e-02              -9.703819e-03
##          Numero_temporada13         Numero_temporada14
##               -4.289863e-02              -4.929810e-02
##          Numero_temporada15
##               -1.768696e-02
```

```
summary(modelo_gamlss) #AIC:     -1617.542
```

```
## ******************************************************************
## Family:  c("BE", "Beta")
##
## Call:  gamlss(formula = WINP ~ ., family = BE, data = dados_regressao)
```

```
##
## Fitting method: RS()
##
## ------------------------------------------------------------------
## Mu link function:  logit
## Mu Coefficients:
##                              Estimate Std. Error t value Pr(>|t|)
## (Intercept)                -1.745e+00  5.677e+00  -0.307  0.75866
## TEAMBoston Celtics         -5.872e-02  5.815e-02  -1.010  0.31323
## TEAMBrooklyn Nets           2.832e-02  6.128e-02   0.462  0.64426
## TEAMCharlotte Bobcats       3.030e-02  8.246e-02   0.367  0.71347
## TEAMCharlotte Hornets      -3.680e-02  6.710e-02  -0.548  0.58374
## TEAMChicago Bulls           4.665e-02  5.821e-02   0.801  0.42337
## TEAMCleveland Cavaliers     2.738e-02  5.879e-02   0.466  0.64163
## TEAMDallas Mavericks       -7.466e-02  5.941e-02  -1.257  0.20970
## TEAMDenver Nuggets          7.957e-04  5.807e-02   0.014  0.98907
## TEAMDetroit Pistons        -1.206e-01  6.053e-02  -1.992  0.04706 *
## TEAMGolden State Warriors  -6.539e-02  6.196e-02  -1.055  0.29193
## TEAMHouston Rockets         5.090e-02  6.049e-02   0.841  0.40063
## TEAMIndiana Pacers         -1.953e-02  5.735e-02  -0.341  0.73362
## TEAMLA Clippers            -3.467e-02  7.106e-02  -0.488  0.62588
## TEAMLos Angeles Clippers   -7.768e-02  7.707e-02  -1.008  0.31414
## TEAMLos Angeles Lakers      3.365e-02  5.850e-02   0.575  0.56548
## TEAMMemphis Grizzlies       5.077e-02  5.916e-02   0.858  0.39129
## TEAMMiami Heat             -1.300e-02  5.868e-02  -0.222  0.82473
## TEAMMilwaukee Bucks        -6.946e-02  5.705e-02  -1.217  0.22418
## TEAMMinnesota Timberwolves -1.912e-01  5.832e-02  -3.279  0.00114 **
## TEAMNew Jersey Nets        -1.403e-01  9.411e-02  -1.491  0.13684
## TEAMNew Orleans Hornets    -8.191e-02  8.058e-02  -1.016  0.31005
## TEAMNew Orleans Pelicans   -1.439e-01  6.307e-02  -2.282  0.02303 *
## TEAMNew York Knicks        -9.262e-02  5.931e-02  -1.562  0.11922
## TEAMOklahoma City Thunder   8.419e-03  6.344e-02   0.133  0.89451
## TEAMOrlando Magic          -6.816e-02  5.834e-02  -1.168  0.24344
## TEAMPhiladelphia 76ers     -9.044e-02  5.936e-02  -1.524  0.12842
## TEAMPhoenix Suns           -2.098e-02  6.008e-02  -0.349  0.72710
## TEAMPortland Trail Blazers  4.528e-02  5.957e-02   0.760  0.44764
## TEAMSacramento Kings       -4.641e-02  5.900e-02  -0.787  0.43195
## TEAMSan Antonio Spurs      -5.241e-02  5.882e-02  -0.891  0.37352
## TEAMToronto Raptors        -5.236e-02  5.840e-02  -0.896  0.37056
## TEAMUtah Jazz              -1.252e-01  5.862e-02  -2.135  0.03337 *
## TEAMWashington Wizards     -6.334e-02  5.849e-02  -1.083  0.27955
## PTS                        -1.295e-01  5.792e-02  -2.235  0.02599 *
## FGM                         1.809e-01  8.944e-02   2.023  0.04380 *
## FGA                         1.261e-02  6.421e-02   0.196  0.84438
## FGP                         9.625e-02  1.148e-01   0.839  0.40224
## `3PM`                       7.866e-02  8.875e-02   0.886  0.37599
## `3PA`                       2.018e-02  2.280e-02   0.885  0.37657
## `3PP`                       2.312e-02  1.580e-02   1.464  0.14412
## FTM                         2.918e-01  1.034e-01   2.821  0.00504 **
## FTA                        -1.361e-01  8.032e-02  -1.694  0.09105 .
## FTP                        -3.677e-02  2.430e-02  -1.513  0.13105
## OREB                        2.404e-01  1.515e-01   1.587  0.11332
## DREB                        2.396e-01  1.507e-01   1.590  0.11274
## REB                        -2.071e-01  1.498e-01  -1.383  0.16746
```

```
## AST                          8.921e-03  6.811e-03   1.310  0.19106
## TOV                         -4.091e-02  1.589e-02  -2.574  0.01042 *
## STL                          4.407e-02  1.759e-02   2.506  0.01264 *
## BLK                         -3.007e-05  1.235e-02  -0.002  0.99806
## BLKA                        -2.126e-02  1.803e-02  -1.180  0.23890
## PF                          -6.279e-03  7.881e-03  -0.797  0.42607
## PFD                          2.031e-02  1.567e-02   1.296  0.19582
## PlusMinus                    1.127e-01  6.465e-03  17.431  < 2e-16 ***
## Numero_temporada2            2.159e-02  4.160e-02   0.519  0.60407
## Numero_temporada3            2.208e-02  4.118e-02   0.536  0.59204
## Numero_temporada4            4.392e-02  4.771e-02   0.921  0.35778
## Numero_temporada5            7.634e-03  4.526e-02   0.169  0.86616
## Numero_temporada6           -6.390e-03  4.344e-02  -0.147  0.88313
## Numero_temporada7            1.586e-02  4.788e-02   0.331  0.74067
## Numero_temporada8            7.494e-03  5.145e-02   0.146  0.88427
## Numero_temporada9           -3.938e-03  5.556e-02  -0.071  0.94354
## Numero_temporada10          -2.007e-02  6.232e-02  -0.322  0.74761
## Numero_temporada11          -1.917e-02  7.315e-02  -0.262  0.79340
## Numero_temporada12          -9.704e-03  7.449e-02  -0.130  0.89642
## Numero_temporada13          -4.290e-02  7.922e-02  -0.542  0.58847
## Numero_temporada14          -4.930e-02  7.962e-02  -0.619  0.53618
## Numero_temporada15          -1.769e-02  7.511e-02  -0.235  0.81395
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ------------------------------------------------------------------
## Sigma link function:  logit
## Sigma Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -2.54704    0.03973  -64.11   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ------------------------------------------------------------------
## No. of observations in the fit:  450
## Degrees of Freedom for the fit:  70
##       Residual Deg. of Freedom:  380
##                       at cycle:  4
##
## Global Deviance:     -1751.076
##             AIC:     -1611.076
##             SBC:     -1323.428
## ******************************************************************
```

```
### Modelo com variáveis significantes em 10% ####
modelo_gamlss1 <- gamlss(WINP ~ `3PP` + FTM + STL + PlusMinus, data = dados_regressao, family = BE)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1316.911
## GAMLSS-RS iteration 2: Global Deviance = -1664.036
## GAMLSS-RS iteration 3: Global Deviance = -1664.526
## GAMLSS-RS iteration 4: Global Deviance = -1664.526
```

```
modelo_gamlss1
```

```
##
```

```
## Family:  c("BE", "Beta")
## Fitting method: RS()
##
## Call:  gamlss(formula = WINP ~ `3PP` + FTM + STL + PlusMinus,
##     family = BE, data = dados_regressao)
##
## Mu Coefficients:
## (Intercept)        `3PP`          FTM          STL    PlusMinus
##  -0.2405400    0.0081551   -0.0029726   -0.0004249    0.1341058
## Sigma Coefficients:
## (Intercept)
##      -2.444
##
##  Degrees of Freedom for the fit: 6 Residual Deg. of Freedom   444
## Global Deviance:     -1664.53
##             AIC:     -1652.53
##             SBC:     -1627.87
```

```
coef(modelo_gamlss1)
```

```
##   (Intercept)         `3PP`           FTM           STL     PlusMinus
## -0.2405399799  0.0081550523 -0.0029726296 -0.0004248911  0.1341058097
```

```
summary(modelo_gamlss1) #Só Plus Minus foi significativo.
```

```
## ******************************************************************
## Family:  c("BE", "Beta")
##
## Call:  gamlss(formula = WINP ~ `3PP` + FTM + STL + PlusMinus,
##     family = BE, data = dados_regressao)
##
## Fitting method: RS()
##
## ------------------------------------------------------------------
## Mu link function:  logit
## Mu Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.2405400  0.2430720  -0.990    0.323
## `3PP`        0.0081551  0.0053672   1.519    0.129
## FTM         -0.0029726  0.0045266  -0.657    0.512
## STL         -0.0004249  0.0098042  -0.043    0.965
## PlusMinus    0.1341058  0.0022462  59.705   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ------------------------------------------------------------------
## Sigma link function:  logit
## Sigma Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -2.44368    0.03589  -68.09   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ------------------------------------------------------------------
## No. of observations in the fit:  450
```

```
## Degrees of Freedom for the fit:  6
##       Residual Deg. of Freedom:  444
##                       at cycle:  4
##
## Global Deviance:     -1664.526
##             AIC:     -1652.526
##             SBC:     -1627.87
## ******************************************************************
```

```
#AIC:     -1652.526

############## Forward Selection beta ###########
gamlss_completo = gamlss(WINP ~ ., data = dados_regressao, family = BE)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1351.587
## GAMLSS-RS iteration 2: Global Deviance = -1750.471
## GAMLSS-RS iteration 3: Global Deviance = -1751.076
## GAMLSS-RS iteration 4: Global Deviance = -1751.076
```

```
gamlss_vazio = gamlss(WINP ~ 1, data = dados_regressao, family = BE)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -440.3197
## GAMLSS-RS iteration 2: Global Deviance = -440.3212
## GAMLSS-RS iteration 3: Global Deviance = -440.3212
```

```
step(gamlss_vazio, scope=list(upper=gamlss_completo, lower=gamlss_vazio), direction='forward', trace=TRU
```

```
## Start:  AIC=-436.32
## WINP ~ 1
##
## trying - TEAM
## trying - PTS
## trying - FGM
## trying - FGA
## trying - FGP
## trying - `3PM`
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLK
## trying - BLKA
## trying - PF
## trying - PFD
## trying - PlusMinus
## trying - Numero_temporada
##                    Df      AIC     LRT   Pr(Chi)
## + PlusMinus         1 -1655.35 1221.03 < 2.2e-16 ***
## + FGP               1  -642.17  207.85 < 2.2e-16 ***
```

```
## + `3PP`             1  -592.98  158.65 < 2.2e-16 ***
## + BLKA              1  -546.72  112.40 < 2.2e-16 ***
## + DREB              1  -487.65   53.33 2.827e-13 ***
## + PTS               1  -480.48   46.16 1.088e-11 ***
## + TEAM             33  -478.01  107.69 7.514e-10 ***
## + FGM               1  -473.63   39.31 3.609e-10 ***
## + TOV               1  -472.43   38.11 6.692e-10 ***
## + AST               1  -470.25   35.93 2.046e-09 ***
## + REB               1  -466.10   31.78 1.726e-08 ***
## + BLK               1  -464.41   30.09 4.128e-08 ***
## + PF                1  -453.78   19.46 1.027e-05 ***
## + `3PM`             1  -452.66   18.34 1.850e-05 ***
## + FTP               1  -448.34   14.02 0.0001809 ***
## + FTM               1  -447.01   12.68 0.0003688 ***
## + STL               1  -446.53   12.21 0.0004747 ***
## + OREB              1  -442.70    8.38 0.0037993 **
## + PFD               1  -440.73    6.41 0.0113445 *
## + `3PA`             1  -440.40    6.08 0.0136559 *
## + FTA               1  -439.26    4.94 0.0261927 *
## + FGA               1  -437.65    3.33 0.0681982 .
## <none>                 -436.32
## + Numero_temporada 14  -408.37    0.05 1.0000000
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1315.679
## GAMLSS-RS iteration 2: Global Deviance = -1660.864
## GAMLSS-RS iteration 3: Global Deviance = -1661.349
## GAMLSS-RS iteration 4: Global Deviance = -1661.349
##
## Step:  AIC=-1655.35
## WINP ~ PlusMinus
##
## trying - TEAM
## trying - PTS
## trying - FGM
## trying - FGA
## trying - FGP
## trying - `3PM`
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLK
## trying - BLKA
## trying - PF
## trying - PFD
## trying - Numero_temporada
```

```
##                     Df     AIC    LRT Pr(Chi)
## + FGP                1 -1658.9  5.554 0.01844 *
## + OREB               1 -1658.5  5.157 0.02315 *
## + PF                 1 -1658.3  4.913 0.02665 *
## + `3PP`              1 -1656.1  2.746 0.09752 .
## + FGA                1 -1655.8  2.505 0.11350
## + BLKA               1 -1655.8  2.419 0.11988
## + REB                1 -1655.6  2.217 0.13649
## <none>                 -1655.3
## + `3PA`              1 -1654.5  1.178 0.27769
## + FTA                1 -1654.2  0.853 0.35562
## + `3PM`              1 -1654.2  0.822 0.36472
## + FTM                1 -1654.1  0.746 0.38769
## + PFD                1 -1654.0  0.686 0.40763
## + PTS                1 -1653.8  0.490 0.48380
## + TOV                1 -1653.8  0.443 0.50580
## + AST                1 -1653.5  0.206 0.64987
## + BLK                1 -1653.5  0.128 0.72096
## + STL                1 -1653.5  0.111 0.73861
## + FGM                1 -1653.4  0.016 0.89842
## + DREB               1 -1653.4  0.013 0.90832
## + FTP                1 -1653.3  0.001 0.96956
## + TEAM              33 -1642.3 52.909 0.01540 *
## + Numero_temporada  14 -1627.9  0.580 1.00000
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1317.833
## GAMLSS-RS iteration 2: Global Deviance = -1666.409
## GAMLSS-RS iteration 3: Global Deviance = -1666.902
## GAMLSS-RS iteration 4: Global Deviance = -1666.902
##
## Step:  AIC=-1658.9
## WINP ~ PlusMinus + FGP
##
## trying - TEAM
## trying - PTS
## trying - FGM
## trying - FGA
## trying - `3PM`
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLK
## trying - BLKA
## trying - PF
## trying - PFD
```

```
## trying - Numero_temporada
##                     Df     AIC    LRT Pr(Chi)
## + PTS                1 -1662.2  5.314 0.02115 *
## + PF                 1 -1662.0  5.077 0.02425 *
## + FGM                1 -1661.3  4.417 0.03558 *
## + FGA                1 -1661.2  4.243 0.03941 *
## + `3PA`              1 -1659.2  2.322 0.12757
## + OREB               1 -1659.1  2.163 0.14134
## + `3PM`              1 -1659.0  2.131 0.14434
## <none>                 -1658.9
## + REB                1 -1658.3  1.450 0.22855
## + BLKA               1 -1658.1  1.215 0.27033
## + FTM                1 -1658.0  1.099 0.29458
## + AST                1 -1657.8  0.942 0.33188
## + FTA                1 -1657.8  0.935 0.33368
## + TOV                1 -1657.8  0.873 0.35001
## + `3PP`              1 -1657.7  0.829 0.36256
## + PFD                1 -1657.5  0.591 0.44191
## + DREB               1 -1657.0  0.140 0.70823
## + BLK                1 -1657.0  0.124 0.72513
## + FTP                1 -1657.0  0.115 0.73485
## + STL                1 -1657.0  0.112 0.73825
## + TEAM              33 -1645.4 52.459 0.01704 *
## + Numero_temporada  14 -1634.8  3.885 0.99612
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1319.722
## GAMLSS-RS iteration 2: Global Deviance = -1671.714
## GAMLSS-RS iteration 3: Global Deviance = -1672.217
## GAMLSS-RS iteration 4: Global Deviance = -1672.217
##
## Step:  AIC=-1662.22
## WINP ~ PlusMinus + FGP + PTS
##
## trying - TEAM
## trying - FGM
## trying - FGA
## trying - `3PM`
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLK
## trying - BLKA
## trying - PF
## trying - PFD
## trying - Numero_temporada
```

```
##                     Df     AIC    LRT Pr(Chi)
## + PF                 1 -1664.8  4.626 0.03149 *
## + DREB               1 -1663.0  2.797 0.09446 .
## + OREB               1 -1662.6  2.397 0.12160
## <none>                 -1662.2
## + TOV                1 -1661.5  1.318 0.25092
## + `3PM`              1 -1661.3  1.066 0.30180
## + `3PA`              1 -1661.3  1.053 0.30489
## + `3PP`              1 -1661.2  1.032 0.30964
## + BLKA               1 -1661.0  0.799 0.37143
## + FTA                1 -1660.9  0.695 0.40455
## + FTM                1 -1660.7  0.516 0.47270
## + PFD                1 -1660.5  0.311 0.57685
## + BLK                1 -1660.4  0.211 0.64593
## + AST                1 -1660.4  0.182 0.67002
## + REB                1 -1660.4  0.171 0.67936
## + FTP                1 -1660.2  0.038 0.84551
## + STL                1 -1660.2  0.034 0.85324
## + FGM                1 -1660.2  0.006 0.94035
## + FGA                1 -1660.2  0.000 0.98268
## + TEAM              33 -1648.3 52.088 0.01852 *
## + Numero_temporada  14 -1638.5  4.259 0.99370
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1321.858
## GAMLSS-RS iteration 2: Global Deviance = -1676.336
## GAMLSS-RS iteration 3: Global Deviance = -1676.843
## GAMLSS-RS iteration 4: Global Deviance = -1676.843
##
## Step:  AIC=-1664.84
## WINP ~ PlusMinus + FGP + PTS + PF
##
## trying - TEAM
## trying - FGM
## trying - FGA
## trying - `3PM`
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLK
## trying - BLKA
## trying - PFD
## trying - Numero_temporada
##                     Df     AIC    LRT Pr(Chi)
## <none>                 -1664.8
## + OREB               1 -1664.3  1.427 0.23228
```

```
## + DREB              1 -1664.0  1.201 0.27316
## + `3PP`             1 -1664.0  1.197 0.27399
## + BLKA              1 -1663.3  0.439 0.50743
## + `3PM`             1 -1663.2  0.307 0.57924
## + `3PA`             1 -1663.1  0.259 0.61115
## + FGM               1 -1663.1  0.226 0.63466
## + TOV               1 -1663.1  0.220 0.63874
## + FGA               1 -1663.0  0.132 0.71595
## + STL               1 -1663.0  0.109 0.74185
## + PFD               1 -1662.9  0.091 0.76341
## + BLK               1 -1662.9  0.046 0.83095
## + FTP               1 -1662.9  0.022 0.88264
## + FTA               1 -1662.8  0.010 0.91911
## + REB               1 -1662.8  0.009 0.92423
## + AST               1 -1662.8  0.002 0.96746
## + FTM               1 -1662.8  0.000 0.98961
## + TEAM             33 -1648.1 49.262 0.03415 *
## + Numero_temporada 14 -1640.6  3.743 0.99682
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Family:  c("BE", "Beta")
## Fitting method: RS()
##
## Call:  gamlss(formula = WINP ~ PlusMinus + FGP + PTS + PF,
##     family = BE, data = dados_regressao)
##
## Mu Coefficients:
## (Intercept)    PlusMinus          FGP          PTS           PF
##   -0.505065     0.131669     0.023267    -0.003065    -0.012155
## Sigma Coefficients:
## (Intercept)
##      -2.458
##
##  Degrees of Freedom for the fit: 6 Residual Deg. of Freedom   444
## Global Deviance:     -1676.84
##             AIC:     -1664.84
##             SBC:     -1640.19
```

```r
# Call:  gamlss(formula = WINP ~ PlusMinus + FGP + PTS + PF,      family = BE, data = dados_regressao)
#
# Mu Coefficients:
#   (Intercept)    PlusMinus          FGP          PTS           PF
# -0.505065     0.131669     0.023267    -0.003065    -0.012155
# Sigma Coefficients:
#   (Intercept)
# -2.458
#
# Degrees of Freedom for the fit: 6 Residual Deg. of Freedom   444
# Global Deviance:     -1676.84
# AIC:     -1664.84
# SBC:     -1640.19

gamlss_beta_forw = gamlss(formula = WINP ~ PlusMinus + FGP + PTS + PF, family = BE, data = dados_regress
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1321.858
## GAMLSS-RS iteration 2: Global Deviance = -1676.336
## GAMLSS-RS iteration 3: Global Deviance = -1676.843
## GAMLSS-RS iteration 4: Global Deviance = -1676.843
```

```
gamlss_beta_forw
```

```
##
## Family:  c("BE", "Beta")
## Fitting method: RS()
##
## Call:  gamlss(formula = WINP ~ PlusMinus + FGP + PTS + PF,
##     family = BE, data = dados_regressao)
##
## Mu Coefficients:
## (Intercept)    PlusMinus          FGP          PTS           PF
##   -0.505065     0.131669     0.023267    -0.003065    -0.012155
## Sigma Coefficients:
## (Intercept)
##      -2.458
##
##  Degrees of Freedom for the fit: 6 Residual Deg. of Freedom   444
## Global Deviance:     -1676.84
##             AIC:     -1664.84
##             SBC:     -1640.19
```

```
coef(gamlss_beta_forw)
```

```
##  (Intercept)    PlusMinus          FGP          PTS           PF
## -0.505064513  0.131668749  0.023266609 -0.003064737 -0.012154978
```

```
summary(gamlss_beta_forw) #AIC:     -1664.843
```

```
## ******************************************************************
## Family:  c("BE", "Beta")
##
## Call:  gamlss(formula = WINP ~ PlusMinus + FGP + PTS + PF,
##     family = BE, data = dados_regressao)
##
## Fitting method: RS()
##
## ------------------------------------------------------------------
## Mu link function:  logit
## Mu Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.505065   0.305547  -1.653  0.09904 .
## PlusMinus    0.131669   0.002219  59.330  < 2e-16 ***
## FGP          0.023267   0.007249   3.210  0.00143 **
## PTS         -0.003065   0.001395  -2.198  0.02849 *
## PF          -0.012155   0.005639  -2.156  0.03165 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ------------------------------------------------------------------
## Sigma link function:  logit
## Sigma Coefficients:
```

```
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -2.45847    0.03586  -68.56   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ------------------------------------------------------------------
## No. of observations in the fit:  450
## Degrees of Freedom for the fit:  6
##       Residual Deg. of Freedom:  444
##                       at cycle:  4
##
## Global Deviance:     -1676.843
##             AIC:     -1664.843
##             SBC:     -1640.188
## ******************************************************************
```

```
###### backward regression beta ########
#Selecão das variáveis para compor o modelo, mas precisa depois fazer os teste de resíduo
gamlss_completo = gamlss(WINP ~ ., data = dados_regressao, family = BE)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1351.587
## GAMLSS-RS iteration 2: Global Deviance = -1750.471
## GAMLSS-RS iteration 3: Global Deviance = -1751.076
## GAMLSS-RS iteration 4: Global Deviance = -1751.076
```

```
gamlss_vazio = gamlss(WINP ~ 1, data = dados_regressao, family = BE)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -440.3197
## GAMLSS-RS iteration 2: Global Deviance = -440.3212
## GAMLSS-RS iteration 3: Global Deviance = -440.3212
```

```
step(gamlss_completo, scope=list(upper=gamlss_completo, lower=gamlss_vazio), direction='backward', trac
```

```
## Start:  AIC=-1611.08
## WINP ~ TEAM + PTS + FGM + FGA + FGP + `3PM` + `3PA` + `3PP` +
##     FTM + FTA + FTP + OREB + DREB + REB + AST + TOV + STL + BLK +
##     BLKA + PF + PFD + PlusMinus + Numero_temporada
##
## trying - TEAM
## trying - PTS
## trying - FGM
## trying - FGA
## trying - FGP
## trying - `3PM`
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLK
```

```
## trying - BLKA
## trying - PF
## trying - PFD
## trying - PlusMinus
## trying - Numero_temporada
##                     Df     AIC     LRT   Pr(Chi)
## - Numero_temporada 14 -1636.3   2.816  0.999357
## - TEAM             33 -1617.5  59.534  0.003116 **
## - BLK               1 -1613.1   0.000  0.998062
## - FGA               1 -1613.0   0.043  0.836232
## - `3PM`             1 -1612.7   0.417  0.518449
## - PF                1 -1612.4   0.634  0.425829
## - FGM               1 -1612.3   0.744  0.388537
## - FGP               1 -1612.3   0.772  0.379473
## - `3PA`             1 -1612.3   0.779  0.377337
## - BLKA              1 -1611.7   1.392  0.238133
## - PTS               1 -1611.5   1.527  0.216587
## - PFD               1 -1611.4   1.658  0.197933
## - AST               1 -1611.4   1.712  0.190786
## - REB               1 -1611.2   1.863  0.172301
## <none>                -1611.1
## - `3PP`             1 -1610.9   2.139  0.143575
## - FTP               1 -1610.8   2.300  0.129393
## - OREB              1 -1610.6   2.444  0.117992
## - DREB              1 -1610.6   2.459  0.116867
## - FTA               1 -1610.2   2.857  0.090991 .
## - FTM               1 -1608.2   4.860  0.027493 *
## - STL               1 -1606.8   6.256  0.012378 *
## - TOV               1 -1606.5   6.569  0.010375 *
## - PlusMinus         1 -1378.1 235.003 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1350.529
## GAMLSS-RS iteration 2: Global Deviance = -1747.66
## GAMLSS-RS iteration 3: Global Deviance = -1748.26
## GAMLSS-RS iteration 4: Global Deviance = -1748.26
##
## Step:  AIC=-1636.26
## WINP ~ TEAM + PTS + FGM + FGA + FGP + `3PM` + `3PA` + `3PP` +
##     FTM + FTA + FTP + OREB + DREB + REB + AST + TOV + STL + BLK +
##     BLKA + PF + PFD + PlusMinus
##
## trying - TEAM
## trying - PTS
## trying - FGM
## trying - FGA
## trying - FGP
## trying - `3PM`
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
```

```
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLK
## trying - BLKA
## trying - PF
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT   Pr(Chi)
## - TEAM      33 -1643.7  58.54  0.004005 **
## - BLK        1 -1638.3   0.00  0.951889
## - FGA        1 -1638.2   0.06  0.803893
## - `3PM`      1 -1637.9   0.38  0.538467
## - `3PA`      1 -1637.7   0.54  0.461652
## - FGP        1 -1637.7   0.61  0.435264
## - FGM        1 -1637.6   0.68  0.408962
## - PF         1 -1637.4   0.85  0.357889
## - PFD        1 -1637.0   1.21  0.270391
## - PTS        1 -1636.9   1.36  0.243675
## - AST        1 -1636.8   1.46  0.226673
## - REB        1 -1636.8   1.48  0.223554
## - BLKA       1 -1636.5   1.74  0.186629
## - `3PP`      1 -1636.5   1.78  0.181687
## - OREB       1 -1636.4   1.87  0.171684
## - DREB       1 -1636.3   1.93  0.165274
## <none>         -1636.3
## - FTP        1 -1635.4   2.90  0.088578 .
## - FTA        1 -1635.1   3.19  0.073911 .
## - FTM        1 -1633.2   5.10  0.023947 *
## - TOV        1 -1633.0   5.26  0.021806 *
## - STL        1 -1632.5   5.74  0.016547 *
## - PlusMinus  1 -1263.9 374.36 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1327.232
## GAMLSS-RS iteration 2: Global Deviance = -1689.197
## GAMLSS-RS iteration 3: Global Deviance = -1689.72
## GAMLSS-RS iteration 4: Global Deviance = -1689.72
##
## Step:  AIC=-1643.72
## WINP ~ PTS + FGM + FGA + FGP + `3PM` + `3PA` + `3PP` + FTM +
##     FTA + FTP + OREB + DREB + REB + AST + TOV + STL + BLK + BLKA +
##     PF + PFD + PlusMinus
##
## trying - PTS
## trying - FGM
## trying - FGA
## trying - FGP
## trying - `3PM`
## trying - `3PA`
## trying - `3PP`
## trying - FTM
```

```
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLK
## trying - BLKA
## trying - PF
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT Pr(Chi)
## - `3PM`      1 -1645.7   0.00 0.96878
## - BLK        1 -1645.7   0.01 0.93625
## - AST        1 -1645.7   0.02 0.87792
## - BLKA       1 -1645.7   0.06 0.81202
## - FGM        1 -1645.6   0.11 0.73486
## - FGA        1 -1645.4   0.29 0.58720
## - PTS        1 -1645.1   0.65 0.42129
## - FTP        1 -1644.9   0.84 0.36043
## - REB        1 -1644.8   0.87 0.35017
## - PFD        1 -1644.8   0.91 0.34075
## - FGP        1 -1644.7   1.03 0.31060
## - OREB       1 -1644.7   1.04 0.30693
## - FTA        1 -1644.6   1.09 0.29596
## - DREB       1 -1644.6   1.11 0.29150
## - `3PA`      1 -1644.0   1.69 0.19329
## - FTM        1 -1643.8   1.89 0.16933
## <none>         -1643.7
## - TOV        1 -1643.7   2.03 0.15465
## - STL        1 -1643.2   2.55 0.11028
## - PF         1 -1643.0   2.67 0.10247
## - `3PP`      1 -1642.9   2.82 0.09313 .
## - PlusMinus  1 -1226.6 419.09 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1327.231
## GAMLSS-RS iteration 2: Global Deviance = -1689.196
## GAMLSS-RS iteration 3: Global Deviance = -1689.719
## GAMLSS-RS iteration 4: Global Deviance = -1689.719
##
## Step:  AIC=-1645.72
## WINP ~ PTS + FGM + FGA + FGP + `3PA` + `3PP` + FTM + FTA + FTP +
##     OREB + DREB + REB + AST + TOV + STL + BLK + BLKA + PF + PFD +
##     PlusMinus
##
## trying - PTS
## trying - FGM
## trying - FGA
## trying - FGP
## trying - `3PA`
## trying - `3PP`
```

```
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLK
## trying - BLKA
## trying - PF
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT Pr(Chi)
## - BLK        1 -1647.7   0.01 0.93542
## - AST        1 -1647.7   0.02 0.87868
## - BLKA       1 -1647.7   0.06 0.81228
## - FGM        1 -1647.5   0.16 0.68573
## - FGA        1 -1647.4   0.33 0.56290
## - FTP        1 -1646.9   0.85 0.35535
## - REB        1 -1646.8   0.87 0.35027
## - PFD        1 -1646.8   0.92 0.33804
## - OREB       1 -1646.7   1.04 0.30698
## - DREB       1 -1646.6   1.11 0.29147
## - FTA        1 -1646.6   1.12 0.29049
## - FGP        1 -1646.5   1.18 0.27682
## <none>         -1645.7
## - TOV        1 -1645.7   2.03 0.15440
## - `3PA`      1 -1645.4   2.33 0.12655
## - PTS        1 -1645.4   2.36 0.12463
## - STL        1 -1645.2   2.55 0.11031
## - PF         1 -1645.0   2.67 0.10256
## - FTM        1 -1644.8   2.89 0.08917 .
## - `3PP`      1 -1644.0   3.67 0.05542 .
## - PlusMinus  1 -1228.5 419.26 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1327.22
## GAMLSS-RS iteration 2: Global Deviance = -1689.189
## GAMLSS-RS iteration 3: Global Deviance = -1689.712
## GAMLSS-RS iteration 4: Global Deviance = -1689.712
##
## Step:  AIC=-1647.71
## WINP ~ PTS + FGM + FGA + FGP + `3PA` + `3PP` + FTM + FTA + FTP +
##     OREB + DREB + REB + AST + TOV + STL + BLKA + PF + PFD + PlusMinus
##
## trying - PTS
## trying - FGM
## trying - FGA
## trying - FGP
## trying - `3PA`
## trying - `3PP`
## trying - FTM
```

```
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLKA
## trying - PF
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT Pr(Chi)
## - AST        1 -1649.7   0.02 0.88099
## - BLKA       1 -1649.7   0.06 0.81373
## - FGM        1 -1649.5   0.16 0.68533
## - FGA        1 -1649.4   0.33 0.56364
## - FTP        1 -1648.9   0.85 0.35598
## - REB        1 -1648.8   0.88 0.34957
## - PFD        1 -1648.7   1.00 0.31688
## - OREB       1 -1648.7   1.05 0.30628
## - DREB       1 -1648.6   1.11 0.29111
## - FTA        1 -1648.6   1.12 0.29041
## - FGP        1 -1648.5   1.18 0.27702
## <none>         -1647.7
## - TOV        1 -1647.7   2.07 0.15068
## - `3PA`      1 -1647.4   2.34 0.12601
## - PTS        1 -1647.3   2.36 0.12461
## - STL        1 -1647.2   2.54 0.11077
## - PF         1 -1647.0   2.72 0.09880 .
## - FTM        1 -1646.8   2.89 0.08936 .
## - `3PP`      1 -1646.0   3.68 0.05505 .
## - PlusMinus  1 -1225.3 424.42 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1327.21
## GAMLSS-RS iteration 2: Global Deviance = -1689.167
## GAMLSS-RS iteration 3: Global Deviance = -1689.69
## GAMLSS-RS iteration 4: Global Deviance = -1689.69
##
## Step:  AIC=-1649.69
## WINP ~ PTS + FGM + FGA + FGP + `3PA` + `3PP` + FTM + FTA + FTP +
##     OREB + DREB + REB + TOV + STL + BLKA + PF + PFD + PlusMinus
##
## trying - PTS
## trying - FGM
## trying - FGA
## trying - FGP
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
```

```
## trying - DREB
## trying - REB
## trying - TOV
## trying - STL
## trying - BLKA
## trying - PF
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT Pr(Chi)
## - BLKA       1 -1651.6   0.05 0.82075
## - FGM        1 -1651.5   0.17 0.68133
## - FGA        1 -1651.4   0.33 0.56438
## - FTP        1 -1650.8   0.85 0.35597
## - REB        1 -1650.8   0.90 0.34237
## - PFD        1 -1650.6   1.05 0.30542
## - OREB       1 -1650.6   1.07 0.30109
## - FTA        1 -1650.6   1.12 0.28905
## - DREB       1 -1650.5   1.14 0.28521
## - FGP        1 -1650.5   1.18 0.27761
## <none>         -1649.7
## - TOV        1 -1649.6   2.09 0.14804
## - `3PA`      1 -1649.3   2.34 0.12569
## - PTS        1 -1649.3   2.36 0.12461
## - STL        1 -1649.1   2.55 0.11030
## - PF         1 -1648.8   2.87 0.09025 .
## - FTM        1 -1648.8   2.88 0.08942 .
## - `3PP`      1 -1648.0   3.67 0.05539 .
## - PlusMinus  1 -1222.4 429.33 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1327.205
## GAMLSS-RS iteration 2: Global Deviance = -1689.116
## GAMLSS-RS iteration 3: Global Deviance = -1689.638
## GAMLSS-RS iteration 4: Global Deviance = -1689.638
##
## Step:  AIC=-1651.64
## WINP ~ PTS + FGM + FGA + FGP + `3PA` + `3PP` + FTM + FTA + FTP +
##     OREB + DREB + REB + TOV + STL + PF + PFD + PlusMinus
##
## trying - PTS
## trying - FGM
## trying - FGA
## trying - FGP
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - TOV
## trying - STL
## trying - PF
```

```
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT Pr(Chi)
## - FGM        1 -1653.5   0.16 0.68584
## - FGA        1 -1653.3   0.33 0.56633
## - FTP        1 -1652.8   0.89 0.34486
## - REB        1 -1652.7   0.93 0.33453
## - PFD        1 -1652.5   1.09 0.29729
## - OREB       1 -1652.5   1.10 0.29410
## - FTA        1 -1652.5   1.18 0.27835
## - DREB       1 -1652.5   1.18 0.27807
## - FGP        1 -1652.4   1.19 0.27436
## <none>         -1651.6
## - PTS        1 -1651.3   2.34 0.12619
## - `3PA`      1 -1651.3   2.34 0.12602
## - TOV        1 -1651.3   2.34 0.12584
## - STL        1 -1651.1   2.52 0.11227
## - PF         1 -1650.8   2.82 0.09295 .
## - FTM        1 -1650.7   2.93 0.08692 .
## - `3PP`      1 -1650.0   3.65 0.05620 .
## - PlusMinus  1 -1221.6 432.07 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1327.152
## GAMLSS-RS iteration 2: Global Deviance = -1688.953
## GAMLSS-RS iteration 3: Global Deviance = -1689.475
## GAMLSS-RS iteration 4: Global Deviance = -1689.475
##
## Step:  AIC=-1653.47
## WINP ~ PTS + FGA + FGP + `3PA` + `3PP` + FTM + FTA + FTP + OREB +
##     DREB + REB + TOV + STL + PF + PFD + PlusMinus
##
## trying - PTS
## trying - FGA
## trying - FGP
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - TOV
## trying - STL
## trying - PF
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT Pr(Chi)
## - REB        1 -1654.6   0.89 0.34493
## - FTP        1 -1654.5   0.98 0.32338
## - OREB       1 -1654.4   1.06 0.30357
## - DREB       1 -1654.3   1.13 0.28693
## - PFD        1 -1654.3   1.19 0.27467
```

```
## - FTA        1 -1654.2   1.28 0.25731
## - FGA        1 -1653.7   1.74 0.18718
## <none>         -1653.5
## - TOV        1 -1653.1   2.33 0.12693
## - STL        1 -1653.0   2.45 0.11718
## - FTM        1 -1652.7   2.77 0.09607 .
## - PF         1 -1652.7   2.81 0.09345 .
## - `3PA`      1 -1652.3   3.12 0.07726 .
## - PTS        1 -1652.3   3.13 0.07700 .
## - FGP        1 -1651.0   4.51 0.03368 *
## - `3PP`      1 -1650.8   4.63 0.03150 *
## - PlusMinus  1 -1223.4 432.07 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1326.821
## GAMLSS-RS iteration 2: Global Deviance = -1688.062
## GAMLSS-RS iteration 3: Global Deviance = -1688.583
## GAMLSS-RS iteration 4: Global Deviance = -1688.583
##
## Step:  AIC=-1654.58
## WINP ~ PTS + FGA + FGP + `3PA` + `3PP` + FTM + FTA + FTP + OREB +
##     DREB + TOV + STL + PF + PFD + PlusMinus
##
## trying - PTS
## trying - FGA
## trying - FGP
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - TOV
## trying - STL
## trying - PF
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT Pr(Chi)
## - FTP        1 -1655.7   0.89 0.34664
## - OREB       1 -1655.6   0.96 0.32684
## - PFD        1 -1655.4   1.16 0.28107
## - FTA        1 -1655.4   1.19 0.27574
## - FGA        1 -1654.7   1.86 0.17309
## <none>         -1654.6
## - TOV        1 -1654.3   2.31 0.12817
## - STL        1 -1654.3   2.32 0.12797
## - PF         1 -1654.0   2.61 0.10604
## - FTM        1 -1653.9   2.68 0.10154
## - `3PA`      1 -1653.3   3.26 0.07095 .
## - PTS        1 -1653.3   3.29 0.06982 .
## - DREB       1 -1652.8   3.74 0.05317 .
## - FGP        1 -1651.9   4.70 0.03012 *
## - `3PP`      1 -1651.9   4.71 0.02999 *
```

```
## - PlusMinus  1 -1225.4 431.20 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1326.427
## GAMLSS-RS iteration 2: Global Deviance = -1687.177
## GAMLSS-RS iteration 3: Global Deviance = -1687.697
## GAMLSS-RS iteration 4: Global Deviance = -1687.697
##
## Step:  AIC=-1655.7
## WINP ~ PTS + FGA + FGP + `3PA` + `3PP` + FTM + FTA + OREB + DREB +
##     TOV + STL + PF + PFD + PlusMinus
##
## trying - PTS
## trying - FGA
## trying - FGP
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - OREB
## trying - DREB
## trying - TOV
## trying - STL
## trying - PF
## trying - PFD
## trying - PlusMinus
##            Df     AIC    LRT Pr(Chi)
## - PFD       1 -1656.8   0.92 0.33853
## - OREB      1 -1656.8   0.92 0.33618
## - FTA       1 -1656.8   0.93 0.33586
## <none>        -1655.7
## - TOV       1 -1655.5   2.23 0.13529
## - FGA       1 -1655.4   2.34 0.12619
## - STL       1 -1655.4   2.34 0.12599
## - PF        1 -1655.2   2.55 0.11053
## - DREB      1 -1654.1   3.58 0.05833 .
## - `3PA`     1 -1653.9   3.80 0.05126 .
## - FTM       1 -1653.9   3.82 0.05068 .
## - PTS       1 -1653.8   3.90 0.04818 *
## - FGP       1 -1652.3   5.36 0.02059 *
## - `3PP`     1 -1652.2   5.52 0.01877 *
## - PlusMinus  1 -1227.0 430.73 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1325.981
## GAMLSS-RS iteration 2: Global Deviance = -1686.262
## GAMLSS-RS iteration 3: Global Deviance = -1686.781
## GAMLSS-RS iteration 4: Global Deviance = -1686.781
##
## Step:  AIC=-1656.78
## WINP ~ PTS + FGA + FGP + `3PA` + `3PP` + FTM + FTA + OREB + DREB +
##     TOV + STL + PF + PlusMinus
##
## trying - PTS
```

```
## trying - FGA
## trying - FGP
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - OREB
## trying - DREB
## trying - TOV
## trying - STL
## trying - PF
## trying - PlusMinus
##             Df     AIC    LRT Pr(Chi)
## - FTA        1 -1658.5   0.27 0.60109
## - OREB       1 -1658.2   0.56 0.45415
## - TOV        1 -1657.0   1.79 0.18063
## - STL        1 -1656.9   1.88 0.16986
## <none>         -1656.8
## - PF         1 -1656.6   2.15 0.14287
## - FGA        1 -1656.2   2.56 0.10949
## - DREB       1 -1655.7   3.05 0.08053 .
## - FTM        1 -1655.0   3.74 0.05301 .
## - `3PA`      1 -1654.9   3.85 0.04973 *
## - PTS        1 -1654.8   4.02 0.04502 *
## - FGP        1 -1653.4   5.36 0.02063 *
## - `3PP`      1 -1653.4   5.38 0.02042 *
## - PlusMinus  1 -1201.2 457.60 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1325.887
## GAMLSS-RS iteration 2: Global Deviance = -1685.989
## GAMLSS-RS iteration 3: Global Deviance = -1686.508
## GAMLSS-RS iteration 4: Global Deviance = -1686.508
##
## Step:  AIC=-1658.51
## WINP ~ PTS + FGA + FGP + `3PA` + `3PP` + FTM + OREB + DREB +
##     TOV + STL + PF + PlusMinus
##
## trying - PTS
## trying - FGA
## trying - FGP
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - OREB
## trying - DREB
## trying - TOV
## trying - STL
## trying - PF
## trying - PlusMinus
##             Df     AIC    LRT Pr(Chi)
## - OREB       1 -1660.2   0.33 0.56505
## - STL        1 -1658.9   1.64 0.19998
## - TOV        1 -1658.8   1.71 0.19088
```

```
## <none>         -1658.5
## - PF         1 -1658.2   2.28 0.13111
## - FGA        1 -1658.0   2.51 0.11302
## - DREB       1 -1657.7   2.78 0.09533 .
## - FTM        1 -1657.0   3.55 0.05949 .
## - `3PA`      1 -1656.9   3.63 0.05679 .
## - PTS        1 -1656.7   3.83 0.05026 .
## - FGP        1 -1655.4   5.12 0.02365 *
## - `3PP`      1 -1655.2   5.31 0.02121 *
## - PlusMinus  1 -1179.5 481.05 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1325.702
## GAMLSS-RS iteration 2: Global Deviance = -1685.658
## GAMLSS-RS iteration 3: Global Deviance = -1686.177
## GAMLSS-RS iteration 4: Global Deviance = -1686.177
##
## Step:  AIC=-1660.18
## WINP ~ PTS + FGA + FGP + `3PA` + `3PP` + FTM + DREB + TOV + STL +
##     PF + PlusMinus
##
## trying - PTS
## trying - FGA
## trying - FGP
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - DREB
## trying - TOV
## trying - STL
## trying - PF
## trying - PlusMinus
##             Df      AIC    LRT Pr(Chi)
## - STL        1 -1660.86   1.31 0.25162
## - TOV        1 -1660.73   1.44 0.22976
## <none>         -1660.18
## - PF         1 -1659.63   2.55 0.11026
## - DREB       1 -1659.32   2.86 0.09084 .
## - FGA        1 -1659.26   2.91 0.08782 .
## - `3PA`      1 -1658.65   3.53 0.06033 .
## - FTM        1 -1658.48   3.69 0.05467 .
## - PTS        1 -1658.26   3.92 0.04774 *
## - FGP        1 -1657.16   5.02 0.02506 *
## - `3PP`      1 -1657.12   5.05 0.02456 *
## - PlusMinus  1  -952.27 709.90 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1325.091
## GAMLSS-RS iteration 2: Global Deviance = -1684.345
## GAMLSS-RS iteration 3: Global Deviance = -1684.862
## GAMLSS-RS iteration 4: Global Deviance = -1684.862
##
## Step:  AIC=-1660.86
## WINP ~ PTS + FGA + FGP + `3PA` + `3PP` + FTM + DREB + TOV + PF +
```

```
##     PlusMinus
##
## trying - PTS
## trying - FGA
## trying - FGP
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - DREB
## trying - TOV
## trying - PF
## trying - PlusMinus
##             Df      AIC    LRT Pr(Chi)
## - TOV        1 -1662.14   0.72 0.39610
## - DREB       1 -1661.14   1.72 0.18906
## <none>         -1660.86
## - PF         1 -1660.55   2.31 0.12850
## - FGA        1 -1658.73   4.13 0.04205 *
## - `3PA`      1 -1658.29   4.57 0.03251 *
## - FTM        1 -1658.23   4.63 0.03141 *
## - PTS        1 -1657.84   5.02 0.02505 *
## - `3PP`      1 -1657.60   5.27 0.02174 *
## - FGP        1 -1656.60   6.26 0.01237 *
## - PlusMinus  1  -837.69 825.18 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1324.808
## GAMLSS-RS iteration 2: Global Deviance = -1683.626
## GAMLSS-RS iteration 3: Global Deviance = -1684.142
## GAMLSS-RS iteration 4: Global Deviance = -1684.142
##
## Step:  AIC=-1662.14
## WINP ~ PTS + FGA + FGP + `3PA` + `3PP` + FTM + DREB + PF + PlusMinus
##
## trying - PTS
## trying - FGA
## trying - FGP
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - DREB
## trying - PF
## trying - PlusMinus
##             Df     AIC    LRT Pr(Chi)
## - DREB       1 -1662.9   1.21 0.27141
## <none>         -1662.1
## - PF         1 -1660.2   3.97 0.04621 *
## - FGA        1 -1659.9   4.23 0.03961 *
## - `3PA`      1 -1659.6   4.52 0.03341 *
## - FTM        1 -1659.5   4.61 0.03180 *
## - PTS        1 -1659.2   4.99 0.02550 *
## - `3PP`      1 -1658.6   5.58 0.01813 *
## - FGP        1 -1658.0   6.14 0.01324 *
## - PlusMinus  1  -784.2 879.95 < 2e-16 ***
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1324.374
## GAMLSS-RS iteration 2: Global Deviance = -1682.418
## GAMLSS-RS iteration 3: Global Deviance = -1682.932
## GAMLSS-RS iteration 4: Global Deviance = -1682.932
##
## Step:  AIC=-1662.93
## WINP ~ PTS + FGA + FGP + `3PA` + `3PP` + FTM + PF + PlusMinus
##
## trying - PTS
## trying - FGA
## trying - FGP
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - PF
## trying - PlusMinus
##             Df      AIC    LRT Pr(Chi)
## <none>         -1662.93
## - FGA        1 -1660.35   4.58 0.03234 *
## - FTM        1 -1660.16   4.77 0.02896 *
## - `3PA`      1 -1660.10   4.83 0.02791 *
## - PTS        1 -1659.81   5.12 0.02367 *
## - PF         1 -1659.78   5.16 0.02316 *
## - `3PP`      1 -1659.27   5.66 0.01734 *
## - FGP        1 -1658.68   6.25 0.01241 *
## - PlusMinus  1  -724.14 940.80 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Family:  c("BE", "Beta")
## Fitting method: RS()
##
## Call:  gamlss(formula = WINP ~ PTS + FGA + FGP + `3PA` + `3PP` +
##     FTM + PF + PlusMinus, family = BE, data = dados_regressao)
##
## Mu Coefficients:
## (Intercept)          PTS          FGA          FGP        `3PA`        `3PP`
##    -7.32808     -0.08135      0.07156      0.15412      0.02814      0.02426
##         FTM           PF    PlusMinus
##     0.07866     -0.01374      0.13087
## Sigma Coefficients:
## (Intercept)
##      -2.466
##
##  Degrees of Freedom for the fit: 10 Residual Deg. of Freedom   440
## Global Deviance:     -1682.93
##             AIC:     -1662.93
##             SBC:     -1621.84
# Call:  gamlss(formula = WINP ~ PTS + FGA + FGP + `3PA` + `3PP` + FTM + PF + PlusMinus, family = BE, d
#
# Mu Coefficients:
```

```
#(Intercept)      PTS          FGA          FGP        `3PA`        `3PP`          FTM           PF
# -7.32808     -0.08135      0.07156      0.15412      0.02814      0.02426      0.07866     -0.01374
# Sigma Coefficients:
#   (Intercept)
# -2.466
#
# Degrees of Freedom for the fit: 10 Residual Deg. of Freedom   440
# Global Deviance:     -1682.93
# AIC:     -1662.93
# SBC:     -1621.84
```

```
gamlss_beta_back <- gamlss(formula = WINP ~ PTS + FGA + FGP + `3PA` + `3PP` + FTM + PF + PlusMinus, fami
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1324.374
## GAMLSS-RS iteration 2: Global Deviance = -1682.418
## GAMLSS-RS iteration 3: Global Deviance = -1682.932
## GAMLSS-RS iteration 4: Global Deviance = -1682.932
```

```
gamlss_beta_back
```

```
##
## Family:  c("BE", "Beta")
## Fitting method: RS()
##
## Call:  gamlss(formula = WINP ~ PTS + FGA + FGP + `3PA` + `3PP` +
##     FTM + PF + PlusMinus, family = BE, data = dados_regressao)
##
## Mu Coefficients:
## (Intercept)          PTS          FGA          FGP        `3PA`        `3PP`
##    -7.32808     -0.08135      0.07156      0.15412      0.02814      0.02426
##         FTM           PF    PlusMinus
##     0.07866     -0.01374      0.13087
## Sigma Coefficients:
## (Intercept)
##      -2.466
##
##  Degrees of Freedom for the fit: 10 Residual Deg. of Freedom   440
## Global Deviance:     -1682.93
##             AIC:     -1662.93
##             SBC:     -1621.84
```

```
coef(gamlss_beta_back)
```

```
## (Intercept)         PTS         FGA         FGP       `3PA`       `3PP`
## -7.32807794 -0.08134874  0.07155544  0.15412494  0.02813583  0.02426470
##         FTM          PF   PlusMinus
##  0.07866282 -0.01374419  0.13086671
```

```
summary(gamlss_beta_back) #AIC:     -1662.933
```

```
## ******************************************************************
## Family:  c("BE", "Beta")
##
## Call:  gamlss(formula = WINP ~ PTS + FGA + FGP + `3PA` + `3PP` +
##     FTM + PF + PlusMinus, family = BE, data = dados_regressao)
##
```

```
## Fitting method: RS()
##
## ------------------------------------------------------------------
## Mu link function:  logit
## Mu Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -7.328078   3.054111  -2.399   0.0168 *
## PTS         -0.081349   0.035186  -2.312   0.0212 *
## FGA          0.071555   0.032669   2.190   0.0290 *
## FGP          0.154125   0.060019   2.568   0.0106 *
## `3PA`        0.028136   0.012448   2.260   0.0243 *
## `3PP`        0.024265   0.010020   2.422   0.0159 *
## FTM          0.078663   0.035027   2.246   0.0252 *
## PF          -0.013744   0.006034  -2.278   0.0232 *
## PlusMinus    0.130867   0.002395  54.644   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ------------------------------------------------------------------
## Sigma link function:  logit
## Sigma Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -2.46575    0.03696  -66.72   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ------------------------------------------------------------------
## No. of observations in the fit:  450
## Degrees of Freedom for the fit:  10
##       Residual Deg. of Freedom:  440
##                       at cycle:  4
##
## Global Deviance:     -1682.933
##             AIC:     -1662.933
##             SBC:     -1621.84
## ******************************************************************
```

```
################# Normal ################
gamlss.family(NO)
```

```
##
## GAMLSS Family: NO Normal
## Link function for mu    : identity
## Link function for sigma: log
```

```
#### Modelo Completo família normal ####
modelo_gamlssN <- gamlss(WINP ~ ., data = dados_regressao, family = NO)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1740.945
## GAMLSS-RS iteration 2: Global Deviance = -1740.945
```

```
modelo_gamlssN
```

```
##
## Family:  c("NO", "Normal")
## Fitting method: RS()
```

```
##
## Call:  gamlss(formula = WINP ~ ., family = NO, data = dados_regressao)
##
## Mu Coefficients:
##                (Intercept)          TEAMBoston Celtics
##                  0.3849344                  -0.0120250
##          TEAMBrooklyn Nets       TEAMCharlotte Bobcats
##                  0.0039617                   0.0133796
##      TEAMCharlotte Hornets           TEAMChicago Bulls
##                 -0.0145005                   0.0084856
##    TEAMCleveland Cavaliers        TEAMDallas Mavericks
##                  0.0039967                  -0.0185095
##         TEAMDenver Nuggets         TEAMDetroit Pistons
##                  0.0024464                  -0.0340194
##  TEAMGolden State Warriors         TEAMHouston Rockets
##                 -0.0212880                   0.0120925
##         TEAMIndiana Pacers             TEAMLA Clippers
##                 -0.0059713                  -0.0083375
##   TEAMLos Angeles Clippers      TEAMLos Angeles Lakers
##                 -0.0188479                   0.0052288
##      TEAMMemphis Grizzlies             TEAMMiami Heat
##                  0.0102977                  -0.0047578
##        TEAMMilwaukee Bucks  TEAMMinnesota Timberwolves
##                 -0.0192852                  -0.0476085
##        TEAMNew Jersey Nets     TEAMNew Orleans Hornets
##                 -0.0340128                  -0.0243073
##   TEAMNew Orleans Pelicans         TEAMNew York Knicks
##                 -0.0384255                  -0.0247466
##  TEAMOklahoma City Thunder           TEAMOrlando Magic
##                  0.0034222                  -0.0196853
##     TEAMPhiladelphia 76ers            TEAMPhoenix Suns
##                 -0.0165407                  -0.0043497
## TEAMPortland Trail Blazers        TEAMSacramento Kings
##                  0.0109588                  -0.0181920
##      TEAMSan Antonio Spurs         TEAMToronto Raptors
##                 -0.0117354                  -0.0127437
##              TEAMUtah Jazz      TEAMWashington Wizards
##                 -0.0294224                  -0.0194735
##                        PTS                         FGM
##                 -0.0201604                   0.0275384
##                        FGA                         FGP
##                  0.0001698                   0.0172859
##                      `3PM`                       `3PA`
##                  0.0127936                   0.0031094
##                      `3PP`                         FTM
##                  0.0044865                   0.0577332
##                        FTA                         FTP
##                 -0.0316353                  -0.0086342
##                       OREB                        DREB
##                  0.0629313                   0.0631626
##                        REB                         AST
##                 -0.0552165                   0.0017278
##                        TOV                         STL
##                 -0.0097114                   0.0112387
```

```
##                       BLK                      BLKA
##                -0.0008269                -0.0052525
##                        PF                       PFD
##                -0.0019238                 0.0055098
##                 PlusMinus           Numero_temporada2
##                 0.0258603                 0.0076547
##          Numero_temporada3           Numero_temporada4
##                 0.0057990                 0.0121886
##          Numero_temporada5           Numero_temporada6
##                 0.0003925                 0.0004200
##          Numero_temporada7           Numero_temporada8
##                 0.0048858                 0.0006137
##          Numero_temporada9          Numero_temporada10
##                -0.0010696                -0.0030638
##         Numero_temporada11          Numero_temporada12
##                -0.0004315                 0.0003404
##         Numero_temporada13          Numero_temporada14
##                -0.0050765                -0.0067826
##         Numero_temporada15
##                 0.0017315
## Sigma Coefficients:
## (Intercept)
##      -3.353
##
##  Degrees of Freedom for the fit: 70 Residual Deg. of Freedom   380
## Global Deviance:     -1740.95
##             AIC:     -1600.95
##             SBC:     -1313.3
```

```
coef(modelo_gamlssN)
```

```
##                (Intercept)         TEAMBoston Celtics
##                0.3849343849              -0.0120249534
##          TEAMBrooklyn Nets      TEAMCharlotte Bobcats
##                0.0039616737               0.0133796093
##      TEAMCharlotte Hornets          TEAMChicago Bulls
##               -0.0145004842               0.0084856042
##    TEAMCleveland Cavaliers       TEAMDallas Mavericks
##                0.0039967279              -0.0185095205
##         TEAMDenver Nuggets        TEAMDetroit Pistons
##                0.0024463625              -0.0340193950
##  TEAMGolden State Warriors        TEAMHouston Rockets
##               -0.0212880488               0.0120925104
##         TEAMIndiana Pacers            TEAMLA Clippers
##               -0.0059713348              -0.0083374706
##   TEAMLos Angeles Clippers     TEAMLos Angeles Lakers
##               -0.0188478561               0.0052288163
##      TEAMMemphis Grizzlies             TEAMMiami Heat
##                0.0102977052              -0.0047578049
##        TEAMMilwaukee Bucks TEAMMinnesota Timberwolves
##               -0.0192852414              -0.0476084851
##        TEAMNew Jersey Nets    TEAMNew Orleans Hornets
##               -0.0340127827              -0.0243073352
##   TEAMNew Orleans Pelicans        TEAMNew York Knicks
##               -0.0384255145              -0.0247465856
```

```
##  TEAMOklahoma City Thunder          TEAMOrlando Magic
##               0.0034222224              -0.0196853375
##     TEAMPhiladelphia 76ers           TEAMPhoenix Suns
##              -0.0165407145              -0.0043497439
## TEAMPortland Trail Blazers       TEAMSacramento Kings
##               0.0109587608              -0.0181920093
##      TEAMSan Antonio Spurs        TEAMToronto Raptors
##              -0.0117354013              -0.0127437317
##              TEAMUtah Jazz     TEAMWashington Wizards
##              -0.0294224498              -0.0194734725
##                        PTS                        FGM
##              -0.0201603689                0.0275384184
##                        FGA                        FGP
##               0.0001697572                0.0172859360
##                      `3PM`                      `3PA`
##               0.0127935937                0.0031094284
##                      `3PP`                        FTM
##               0.0044864691                0.0577332209
##                        FTA                        FTP
##              -0.0316353188               -0.0086341618
##                       OREB                       DREB
##               0.0629312660                0.0631626382
##                        REB                        AST
##              -0.0552164560                0.0017278023
##                        TOV                        STL
##              -0.0097113923                0.0112387161
##                        BLK                       BLKA
##              -0.0008268940               -0.0052525500
##                         PF                        PFD
##              -0.0019237932                0.0055097514
##                  PlusMinus          Numero_temporada2
##               0.0258603172                0.0076547454
##          Numero_temporada3          Numero_temporada4
##               0.0057989724                0.0121885856
##          Numero_temporada5          Numero_temporada6
##               0.0003925166                0.0004200458
##          Numero_temporada7          Numero_temporada8
##               0.0048857968                0.0006136884
##          Numero_temporada9         Numero_temporada10
##              -0.0010696264               -0.0030638442
##         Numero_temporada11         Numero_temporada12
##              -0.0004315481                0.0003404450
##         Numero_temporada13         Numero_temporada14
##              -0.0050764532               -0.0067826279
##         Numero_temporada15
##               0.0017314545
```

```
summary(modelo_gamlssN)
```

```
## ******************************************************************
## Family:  c("NO", "Normal")
##
## Call:  gamlss(formula = WINP ~ ., family = NO, data = dados_regressao)
##
## Fitting method: RS()
```

```
##
## ------------------------------------------------------------------
## Mu link function:  identity
## Mu Coefficients:
##                              Estimate Std. Error t value Pr(>|t|)
## (Intercept)                 0.3849344  1.2346217   0.312 0.755376
## TEAMBoston Celtics         -0.0120250  0.0134058  -0.897 0.370289
## TEAMBrooklyn Nets           0.0039617  0.0143299   0.276 0.782344
## TEAMCharlotte Bobcats       0.0133796  0.0187023   0.715 0.474803
## TEAMCharlotte Hornets      -0.0145005  0.0155736  -0.931 0.352395
## TEAMChicago Bulls           0.0084856  0.0135136   0.628 0.530427
## TEAMCleveland Cavaliers     0.0039967  0.0132855   0.301 0.763705
## TEAMDallas Mavericks       -0.0185095  0.0139102  -1.331 0.184103
## TEAMDenver Nuggets          0.0024464  0.0134714   0.182 0.855996
## TEAMDetroit Pistons        -0.0340194  0.0139932  -2.431 0.015513 *
## TEAMGolden State Warriors  -0.0212880  0.0141872  -1.501 0.134312
## TEAMHouston Rockets         0.0120925  0.0138921   0.870 0.384600
## TEAMIndiana Pacers         -0.0059713  0.0134284  -0.445 0.656804
## TEAMLA Clippers            -0.0083375  0.0164677  -0.506 0.612944
## TEAMLos Angeles Clippers   -0.0188479  0.0171424  -1.099 0.272251
## TEAMLos Angeles Lakers      0.0052288  0.0134771   0.388 0.698250
## TEAMMemphis Grizzlies       0.0102977  0.0138220   0.745 0.456719
## TEAMMiami Heat             -0.0047578  0.0136310  -0.349 0.727251
## TEAMMilwaukee Bucks        -0.0192852  0.0132216  -1.459 0.145496
## TEAMMinnesota Timberwolves -0.0476085  0.0133668  -3.562 0.000415 ***
## TEAMNew Jersey Nets        -0.0340128  0.0209876  -1.621 0.105929
## TEAMNew Orleans Hornets    -0.0243073  0.0190439  -1.276 0.202598
## TEAMNew Orleans Pelicans   -0.0384255  0.0148332  -2.591 0.009952 **
## TEAMNew York Knicks        -0.0247466  0.0136851  -1.808 0.071352 .
## TEAMOklahoma City Thunder   0.0034222  0.0144161   0.237 0.812483
## TEAMOrlando Magic          -0.0196853  0.0133762  -1.472 0.141937
## TEAMPhiladelphia 76ers     -0.0165407  0.0135693  -1.219 0.223606
## TEAMPhoenix Suns           -0.0043497  0.0137274  -0.317 0.751520
## TEAMPortland Trail Blazers  0.0109588  0.0137310   0.798 0.425308
## TEAMSacramento Kings       -0.0181920  0.0135544  -1.342 0.180349
## TEAMSan Antonio Spurs      -0.0117354  0.0133387  -0.880 0.379522
## TEAMToronto Raptors        -0.0127437  0.0135686  -0.939 0.348221
## TEAMUtah Jazz              -0.0294224  0.0134983  -2.180 0.029892 *
## TEAMWashington Wizards     -0.0194735  0.0135965  -1.432 0.152898
## PTS                        -0.0201604  0.0238687  -0.845 0.398846
## FGM                         0.0275384  0.0482350   0.571 0.568390
## FGA                         0.0001698  0.0139398   0.012 0.990290
## FGP                         0.0172859  0.0249258   0.693 0.488423
## `3PM`                       0.0127936  0.0279052   0.458 0.646880
## `3PA`                       0.0031094  0.0052114   0.597 0.551087
## `3PP`                       0.0044865  0.0036035   1.245 0.213887
## FTM                         0.0577332  0.0301271   1.916 0.056074 .
## FTA                        -0.0316353  0.0185169  -1.708 0.088369 .
## FTP                        -0.0086342  0.0055763  -1.548 0.122368
## OREB                        0.0629313  0.0352766   1.784 0.075232 .
## DREB                        0.0631626  0.0350413   1.803 0.072256 .
## REB                        -0.0552165  0.0348328  -1.585 0.113756
## AST                         0.0017278  0.0015717   1.099 0.272313
## TOV                        -0.0097114  0.0036505  -2.660 0.008138 **
```

```
## STL                          0.0112387  0.0040363   2.784 0.005630 **
## BLK                         -0.0008269  0.0028274  -0.292 0.770094
## BLKA                        -0.0052525  0.0041433  -1.268 0.205670
## PF                          -0.0019238  0.0018142  -1.060 0.289622
## PFD                          0.0055098  0.0036133   1.525 0.128129
## PlusMinus                    0.0258603  0.0014767  17.512  < 2e-16 ***
## Numero_temporada2            0.0076547  0.0095898   0.798 0.425242
## Numero_temporada3            0.0057990  0.0094591   0.613 0.540205
## Numero_temporada4            0.0121886  0.0109245   1.116 0.265251
## Numero_temporada5            0.0003925  0.0103793   0.038 0.969853
## Numero_temporada6            0.0004200  0.0100309   0.042 0.966620
## Numero_temporada7            0.0048858  0.0110105   0.444 0.657483
## Numero_temporada8            0.0006137  0.0117952   0.052 0.958533
## Numero_temporada9           -0.0010696  0.0127884  -0.084 0.933386
## Numero_temporada10          -0.0030638  0.0143199  -0.214 0.830695
## Numero_temporada11          -0.0004315  0.0168276  -0.026 0.979554
## Numero_temporada12           0.0003404  0.0171394   0.020 0.984163
## Numero_temporada13          -0.0050765  0.0183008  -0.277 0.781632
## Numero_temporada14          -0.0067826  0.0184118  -0.368 0.712792
## Numero_temporada15           0.0017315  0.0173935   0.100 0.920757
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ------------------------------------------------------------------
## Sigma link function:  log
## Sigma Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -3.35332    0.03333  -100.6   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ------------------------------------------------------------------
## No. of observations in the fit:  450
## Degrees of Freedom for the fit:  70
##       Residual Deg. of Freedom:  380
##                       at cycle:  2
##
## Global Deviance:     -1740.945
##             AIC:     -1600.945
##             SBC:     -1313.298
## ******************************************************************
```

```
#AIC:     -1624.372

###Modelo normal com variáveis significativas 10% ####
modelo_gamlssN1 <- gamlss(WINP ~ TOV + STL + PF + PlusMinus, data = dados_regressao, family = NO)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1648.776
## GAMLSS-RS iteration 2: Global Deviance = -1648.776
```

```
modelo_gamlssN1
```

```
##
## Family:  c("NO", "Normal")
## Fitting method: RS()
##
```

```
## Call:  gamlss(formula = WINP ~ TOV + STL + PF + PlusMinus,
##     family = NO, data = dados_regressao)
##
## Mu Coefficients:
## (Intercept)          TOV          STL           PF    PlusMinus
##   5.650e-01   -4.755e-05    5.647e-04   -3.392e-03    3.107e-02
## Sigma Coefficients:
## (Intercept)
##      -3.251
##
##  Degrees of Freedom for the fit: 6 Residual Deg. of Freedom   444
## Global Deviance:     -1648.78
##             AIC:     -1636.78
##             SBC:     -1612.12
```

```
coef(modelo_gamlssN1)
```

```
##   (Intercept)           TOV           STL            PF     PlusMinus
##  5.649862e-01 -4.754703e-05  5.647343e-04 -3.392285e-03  3.107400e-02
```

```
summary(modelo_gamlssN1) #STL não foi significativo
```

```
## ******************************************************************
## Family:  c("NO", "Normal")
##
## Call:  gamlss(formula = WINP ~ TOV + STL + PF + PlusMinus,
##     family = NO, data = dados_regressao)
##
## Fitting method: RS()
##
## ------------------------------------------------------------------
## Mu link function:  identity
## Mu Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  5.650e-01  3.274e-02  17.255   <2e-16 ***
## TOV         -4.755e-05  1.881e-03  -0.025   0.9798
## STL          5.647e-04  2.334e-03   0.242   0.8089
## PF          -3.392e-03  1.413e-03  -2.400   0.0168 *
## PlusMinus    3.107e-02  4.262e-04  72.908   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ------------------------------------------------------------------
## Sigma link function:  log
## Sigma Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -3.25091    0.03333  -97.53   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ------------------------------------------------------------------
## No. of observations in the fit:  450
## Degrees of Freedom for the fit:  6
##       Residual Deg. of Freedom:  444
##                       at cycle:  2
```

```
##
## Global Deviance:     -1648.777
##              AIC:     -1636.777
##              SBC:     -1612.121
## ******************************************************************
```

```
#AIC:     -1638.776

########## Forward Selection Normal ######################
gamlss_completoN = gamlss(WINP ~ ., data = dados_regressao, family = NO)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1740.945
## GAMLSS-RS iteration 2: Global Deviance = -1740.945
```

```
gamlss_vazioN = gamlss(WINP ~ 1, data = dados_regressao, family = NO)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -427.5666
## GAMLSS-RS iteration 2: Global Deviance = -427.5666
```

```
step(gamlss_vazioN, scope=list(upper=gamlss_completoN, lower=gamlss_vazioN), direction='forward', trace=
```

```
## Start:  AIC=-423.57
## WINP ~ 1
##
## trying - TEAM
## trying - PTS
## trying - FGM
## trying - FGA
## trying - FGP
## trying - `3PM`
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLK
## trying - BLKA
## trying - PF
## trying - PFD
## trying - PlusMinus
## trying - Numero_temporada
##                    Df      AIC     LRT   Pr(Chi)
## + PlusMinus         1 -1636.39 1214.82 < 2.2e-16 ***
## + FGP               1  -627.51  205.94 < 2.2e-16 ***
## + `3PP`             1  -578.12  156.55 < 2.2e-16 ***
## + BLKA              1  -534.89  113.32 < 2.2e-16 ***
## + DREB              1  -474.57   53.01 3.323e-13 ***
## + TEAM             33  -467.53  109.96 3.314e-10 ***
## + PTS               1  -466.89   45.32 1.670e-11 ***
## + TOV               1  -460.40   38.84 4.607e-10 ***
```

```
## + FGM               1  -459.24   37.68 8.354e-10 ***
## + AST               1  -455.72   34.16 5.082e-09 ***
## + REB               1  -452.76   31.20 2.332e-08 ***
## + BLK               1  -452.01   30.44 3.444e-08 ***
## + PF                1  -441.52   19.95 7.950e-06 ***
## + `3PM`             1  -439.54   17.98 2.235e-05 ***
## + FTP               1  -435.83   14.27 0.0001588 ***
## + FTM               1  -435.38   13.82 0.0002015 ***
## + STL               1  -433.26   11.69 0.0006277 ***
## + OREB              1  -430.12    8.55 0.0034548 **
## + PFD               1  -428.70    7.13 0.0075777 **
## + `3PA`             1  -427.45    5.88 0.0152848 *
## + FTA               1  -427.17    5.61 0.0178987 *
## + FGA               1  -425.48    3.92 0.0477633 *
## <none>                 -423.57
## + Numero_temporada 14  -395.60    0.03 1.0000000
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1642.391
## GAMLSS-RS iteration 2: Global Deviance = -1642.391
##
## Step:  AIC=-1636.39
## WINP ~ PlusMinus
##
## trying - TEAM
## trying - PTS
## trying - FGM
## trying - FGA
## trying - FGP
## trying - `3PM`
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLK
## trying - BLKA
## trying - PF
## trying - PFD
## trying - Numero_temporada
##                    Df     AIC    LRT  Pr(Chi)
## + PF                1 -1640.7  6.327 0.011894 *
## + OREB              1 -1639.8  5.405 0.020083 *
## + FGP               1 -1638.7  4.296 0.038203 *
## + FGA               1 -1637.3  2.923 0.087328 .
## + REB               1 -1636.6  2.204 0.137652
## + BLKA              1 -1636.6  2.176 0.140169
## <none>                -1636.4
```

```
## + `3PP`             1 -1636.1  1.666 0.196819
## + `3PA`             1 -1635.1  0.730 0.392937
## + TOV               1 -1635.0  0.627 0.428366
## + PTS               1 -1634.9  0.529 0.467031
## + `3PM`             1 -1634.9  0.527 0.468003
## + FTA               1 -1634.8  0.430 0.511818
## + FTM               1 -1634.8  0.404 0.524915
## + BLK               1 -1634.8  0.383 0.536075
## + PFD               1 -1634.7  0.279 0.597232
## + FGM               1 -1634.5  0.139 0.709484
## + STL               1 -1634.5  0.136 0.712686
## + AST               1 -1634.4  0.032 0.857264
## + DREB              1 -1634.4  0.009 0.923329
## + FTP               1 -1634.4  0.003 0.958722
## + TEAM             33 -1631.4 61.030 0.002121 **
## + Numero_temporada 14 -1608.4  0.009 1.000000
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1648.718
## GAMLSS-RS iteration 2: Global Deviance = -1648.718
##
## Step:  AIC=-1640.72
## WINP ~ PlusMinus + PF
##
## trying - TEAM
## trying - PTS
## trying - FGM
## trying - FGA
## trying - FGP
## trying - `3PM`
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLK
## trying - BLKA
## trying - PFD
## trying - Numero_temporada
##                    Df     AIC    LRT  Pr(Chi)
## + FGP               1 -1643.2  4.530 0.033314 *
## + OREB              1 -1642.6  3.870 0.049164 *
## + FGA               1 -1642.0  3.240 0.071843 .
## + REB               1 -1641.6  2.925 0.087211 .
## <none>                -1640.7
## + `3PP`             1 -1640.6  1.873 0.171153
## + BLKA              1 -1640.2  1.516 0.218161
## + `3PA`             1 -1639.8  1.113 0.291505
```

```
## + `3PM`             1 -1639.6  0.846 0.357664
## + PTS               1 -1639.1  0.371 0.542605
## + DREB              1 -1639.0  0.304 0.581507
## + PFD               1 -1639.0  0.273 0.601625
## + FGM               1 -1638.9  0.178 0.673198
## + BLK               1 -1638.8  0.117 0.732861
## + FTM               1 -1638.8  0.066 0.797229
## + FTA               1 -1638.8  0.060 0.805859
## + STL               1 -1638.8  0.058 0.809268
## + FTP               1 -1638.7  0.006 0.935782
## + AST               1 -1638.7  0.003 0.960114
## + TOV               1 -1638.7  0.000 0.984922
## + TEAM             33 -1632.7 58.018 0.004563 **
## + Numero_temporada 14 -1613.9  1.177 0.999997
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1653.247
## GAMLSS-RS iteration 2: Global Deviance = -1653.247
##
## Step:  AIC=-1643.25
## WINP ~ PlusMinus + PF + FGP
##
## trying - TEAM
## trying - PTS
## trying - FGM
## trying - FGA
## trying - `3PM`
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLK
## trying - BLKA
## trying - PFD
## trying - Numero_temporada
##                    Df     AIC    LRT  Pr(Chi)
## + FGM               1 -1646.4  5.193 0.022681 *
## + FGA               1 -1646.2  4.984 0.025578 *
## + PTS               1 -1645.3  4.106 0.042730 *
## + REB               1 -1643.4  2.124 0.145037
## + `3PA`             1 -1643.3  2.067 0.150477
## + AST               1 -1643.3  2.026 0.154614
## <none>                -1643.2
## + `3PM`             1 -1643.2  1.982 0.159182
## + OREB              1 -1642.8  1.521 0.217427
## + BLKA              1 -1641.9  0.665 0.414839
## + DREB              1 -1641.9  0.614 0.433269
```

```
## + `3PP`             1 -1641.7  0.468 0.494129
## + PFD               1 -1641.6  0.363 0.546994
## + FTP               1 -1641.4  0.175 0.675762
## + BLK               1 -1641.3  0.103 0.748601
## + STL               1 -1641.3  0.059 0.808310
## + FTA               1 -1641.3  0.055 0.814947
## + TOV               1 -1641.3  0.053 0.818363
## + FTM               1 -1641.3  0.013 0.910100
## + TEAM             33 -1635.1 57.879 0.004723 **
## + Numero_temporada 14 -1618.4  3.184 0.998702
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1658.44
## GAMLSS-RS iteration 2: Global Deviance = -1658.44
##
## Step:  AIC=-1646.44
## WINP ~ PlusMinus + PF + FGP + FGM
##
## trying - TEAM
## trying - PTS
## trying - FGA
## trying - `3PM`
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLK
## trying - BLKA
## trying - PFD
## trying - Numero_temporada
##                     Df     AIC    LRT  Pr(Chi)
## <none>                 -1646.4
## + DREB               1 -1645.8  1.368 0.242082
## + FGA                1 -1645.5  1.113 0.291331
## + OREB               1 -1645.5  1.009 0.315168
## + `3PP`              1 -1644.8  0.389 0.532873
## + STL                1 -1644.8  0.344 0.557662
## + TOV                1 -1644.8  0.344 0.557726
## + BLKA               1 -1644.7  0.304 0.581651
## + REB                1 -1644.6  0.128 0.720630
## + `3PA`              1 -1644.6  0.123 0.725672
## + `3PM`              1 -1644.5  0.101 0.750067
## + BLK                1 -1644.5  0.095 0.757953
## + FTA                1 -1644.5  0.077 0.781021
## + PFD                1 -1644.5  0.076 0.782247
## + FTM                1 -1644.5  0.062 0.802608
## + AST                1 -1644.5  0.005 0.942778
```

```
## + FTP                1 -1644.4  0.005 0.943992
## + PTS                1 -1644.4  0.004 0.950023
## + TEAM              33 -1637.1 56.705 0.006302 **
## + Numero_temporada 14 -1622.1  3.653 0.997218
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
## Family:  c("NO", "Normal")
## Fitting method: RS()
##
## Call:  gamlss(formula = WINP ~ PlusMinus + PF + FGP + FGM,
##     family = NO, data = dados_regressao)
##
## Mu Coefficients:
## (Intercept)    PlusMinus           PF          FGP          FGM
##    0.401565     0.030261    -0.003478     0.005746    -0.002433
## Sigma Coefficients:
## (Intercept)
##      -3.262
##
##  Degrees of Freedom for the fit: 6 Residual Deg. of Freedom   444
## Global Deviance:     -1658.44
##             AIC:     -1646.44
##             SBC:     -1621.78
```

```
# Call:  gamlss(formula = WINP ~ PlusMinus + PF + FGP + FGM,      family = NO, data = dados_regressao)
#
# Mu Coefficients:
#   (Intercept)    PlusMinus           PF          FGP          FGM
# 0.401565     0.030261    -0.003478     0.005746    -0.002433
# Sigma Coefficients:
#   (Intercept)
# -3.262
#
# Degrees of Freedom for the fit: 6 Residual Deg. of Freedom   444
# Global Deviance:     -1658.44
# AIC:     -1646.44
# SBC:     -1621.78
```

```
gamlss_normal_forw <- gamlss(formula = WINP ~ PlusMinus + PF + FGP + FGM, family = NO, data = dados_regr
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1658.44
## GAMLSS-RS iteration 2: Global Deviance = -1658.44
```

```
gamlss_normal_forw
```

```
##
## Family:  c("NO", "Normal")
## Fitting method: RS()
##
## Call:  gamlss(formula = WINP ~ PlusMinus + PF + FGP + FGM,
##     family = NO, data = dados_regressao)
##
## Mu Coefficients:
## (Intercept)    PlusMinus           PF          FGP          FGM
```

```
##    0.401565     0.030261    -0.003478     0.005746    -0.002433
## Sigma Coefficients:
## (Intercept)
##      -3.262
##
##  Degrees of Freedom for the fit: 6 Residual Deg. of Freedom   444
## Global Deviance:     -1658.44
##             AIC:     -1646.44
##             SBC:     -1621.78
```

```
coef(gamlss_normal_forw)
```

```
##  (Intercept)    PlusMinus           PF          FGP          FGM
##  0.401564997  0.030260547 -0.003477604  0.005745605 -0.002433190
```

```
summary(gamlss_normal_forw) #-1646.44
```

```
## ******************************************************************
## Family:  c("NO", "Normal")
##
## Call:  gamlss(formula = WINP ~ PlusMinus + PF + FGP + FGM,
##     family = NO, data = dados_regressao)
##
## Fitting method: RS()
##
## ------------------------------------------------------------------
## Mu link function:  identity
## Mu Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.4015650  0.0714772   5.618 3.41e-08 ***
## PlusMinus    0.0302605  0.0005029  60.170  < 2e-16 ***
## PF          -0.0034776  0.0013037  -2.667  0.00792 **
## FGP          0.0057456  0.0018499   3.106  0.00202 **
## FGM         -0.0024332  0.0010647  -2.285  0.02276 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ------------------------------------------------------------------
## Sigma link function:  log
## Sigma Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -3.26165    0.03333  -97.85   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ------------------------------------------------------------------
## No. of observations in the fit:  450
## Degrees of Freedom for the fit:  6
##       Residual Deg. of Freedom:  444
##                       at cycle:  2
##
## Global Deviance:     -1658.44
##             AIC:     -1646.44
##             SBC:     -1621.784
## ******************************************************************
```

```
###### backward regression Normal #####
gamlss_completoN = gamlss(WINP ~ ., data = dados_regressao, family = NO)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1740.945
## GAMLSS-RS iteration 2: Global Deviance = -1740.945
```

```
gamlss_vazioN = gamlss(WINP ~ 1, data = dados_regressao, family = NO)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -427.5666
## GAMLSS-RS iteration 2: Global Deviance = -427.5666
```

```
step(gamlss_completoN, scope=list(upper=gamlss_completoN, lower=gamlss_vazioN), direction='backward', t
```

```
## Start:  AIC=-1600.95
## WINP ~ TEAM + PTS + FGM + FGA + FGP + `3PM` + `3PA` + `3PP` +
##     FTM + FTA + FTP + OREB + DREB + REB + AST + TOV + STL + BLK +
##     BLKA + PF + PFD + PlusMinus + Numero_temporada
##
## trying - TEAM
## trying - PTS
## trying - FGM
## trying - FGA
## trying - FGP
## trying - `3PM`
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLK
## trying - BLKA
## trying - PF
## trying - PFD
## trying - PlusMinus
## trying - Numero_temporada
##                     Df     AIC     LRT   Pr(Chi)
## - Numero_temporada 14 -1625.6   3.350 0.9982725
## - FGA               1 -1602.9   0.000 0.9902837
## - BLK               1 -1602.9   0.086 0.7699453
## - `3PM`             1 -1602.7   0.210 0.6466561
## - FGM               1 -1602.6   0.326 0.5681230
## - `3PA`             1 -1602.6   0.356 0.5508106
## - FGP               1 -1602.5   0.481 0.4881153
## - PTS               1 -1602.2   0.713 0.3985015
## - PF                1 -1601.8   1.123 0.2892495
## - AST               1 -1601.7   1.207 0.2719381
## - `3PP`             1 -1601.4   1.547 0.2135133
## - BLKA              1 -1601.3   1.604 0.2052972
## <none>                -1601.0
```

```
## - PFD               1 -1600.6   2.319 0.1277884
## - FTP               1 -1600.5   2.391 0.1220310
## - REB               1 -1600.4   2.506 0.1134266
## - FTA               1 -1600.0   2.909 0.0880654 .
## - OREB              1 -1599.8   3.171 0.0749460 .
## - DREB              1 -1599.7   3.237 0.0719746 .
## - FTM               1 -1599.3   3.657 0.0558213 .
## - TEAM             33 -1598.4  68.524 0.0002755 ***
## - TOV               1 -1595.9   7.022 0.0080510 **
## - STL               1 -1595.3   7.687 0.0055619 **
## - PlusMinus         1 -1369.1 233.853 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1737.595
## GAMLSS-RS iteration 2: Global Deviance = -1737.595
##
## Step:  AIC=-1625.59
## WINP ~ TEAM + PTS + FGM + FGA + FGP + `3PM` + `3PA` + `3PP` +
##     FTM + FTA + FTP + OREB + DREB + REB + AST + TOV + STL + BLK +
##     BLKA + PF + PFD + PlusMinus
##
## trying - TEAM
## trying - PTS
## trying - FGM
## trying - FGA
## trying - FGP
## trying - `3PM`
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLK
## trying - BLKA
## trying - PF
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT   Pr(Chi)
## - FGA        1 -1627.6   0.00 0.9507435
## - BLK        1 -1627.5   0.14 0.7118379
## - `3PA`      1 -1627.4   0.21 0.6430780
## - `3PM`      1 -1627.4   0.23 0.6305249
## - FGP        1 -1627.3   0.25 0.6163238
## - FGM        1 -1627.2   0.43 0.5123576
## - PTS        1 -1626.9   0.68 0.4089033
## - AST        1 -1626.6   1.04 0.3088721
## - `3PP`      1 -1626.5   1.06 0.3027290
## - PF         1 -1626.2   1.40 0.2372509
```

```
## - PFD        1 -1625.7   1.88 0.1706088
## - REB        1 -1625.7   1.93 0.1652317
## - BLKA       1 -1625.6   1.96 0.1620356
## <none>         -1625.6
## - OREB       1 -1625.2   2.40 0.1217108
## - DREB       1 -1625.1   2.46 0.1170552
## - FTP        1 -1624.6   2.96 0.0855855 .
## - FTA        1 -1624.4   3.22 0.0726567 .
## - TEAM      33 -1624.4  67.22 0.0003978 ***
## - FTM        1 -1623.6   4.00 0.0455612 *
## - TOV        1 -1621.5   6.12 0.0133392 *
## - STL        1 -1620.8   6.82 0.0090046 **
## - PlusMinus  1 -1254.4 373.23 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1737.591
## GAMLSS-RS iteration 2: Global Deviance = -1737.591
##
## Step:  AIC=-1627.59
## WINP ~ TEAM + PTS + FGM + FGP + `3PM` + `3PA` + `3PP` + FTM +
##     FTA + FTP + OREB + DREB + REB + AST + TOV + STL + BLK + BLKA +
##     PF + PFD + PlusMinus
##
## trying - TEAM
## trying - PTS
## trying - FGM
## trying - FGP
## trying - `3PM`
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLK
## trying - BLKA
## trying - PF
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT   Pr(Chi)
## - BLK        1 -1629.5   0.14  0.710406
## - `3PA`      1 -1629.4   0.21  0.643546
## - `3PM`      1 -1629.3   0.30  0.581825
## - FGM        1 -1629.2   0.44  0.505591
## - PTS        1 -1628.8   0.79  0.372766
## - AST        1 -1628.6   1.03  0.309385
## - `3PP`      1 -1628.5   1.10  0.293987
## - PF         1 -1628.2   1.41  0.235319
## - PFD        1 -1627.7   1.87  0.171038
```

```
## - REB        1 -1627.7   1.92  0.165627
## - BLKA       1 -1627.6   1.98  0.159254
## <none>         -1627.6
## - OREB       1 -1627.2   2.39  0.121871
## - DREB       1 -1627.1   2.45  0.117219
## - FTP        1 -1626.6   2.96  0.085550 .
## - FTA        1 -1626.4   3.22  0.072595 .
## - TEAM      33 -1626.3  67.27  0.000392 ***
## - FTM        1 -1625.4   4.20  0.040361 *
## - TOV        1 -1623.4   6.22  0.012641 *
## - STL        1 -1622.5   7.12  0.007620 **
## - FGP        1 -1621.2   8.38  0.003799 **
## - PlusMinus  1 -1248.8 380.80 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1737.453
## GAMLSS-RS iteration 2: Global Deviance = -1737.453
##
## Step:  AIC=-1629.45
## WINP ~ TEAM + PTS + FGM + FGP + `3PM` + `3PA` + `3PP` + FTM +
##     FTA + FTP + OREB + DREB + REB + AST + TOV + STL + BLKA +
##     PF + PFD + PlusMinus
##
## trying - TEAM
## trying - PTS
## trying - FGM
## trying - FGP
## trying - `3PM`
## trying - `3PA`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLKA
## trying - PF
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT   Pr(Chi)
## - `3PA`      1 -1631.2   0.21 0.6484737
## - `3PM`      1 -1631.1   0.31 0.5773621
## - FGM        1 -1631.0   0.44 0.5067727
## - PTS        1 -1630.7   0.79 0.3729765
## - AST        1 -1630.4   1.02 0.3120947
## - `3PP`      1 -1630.4   1.09 0.2955499
## - PF         1 -1630.0   1.49 0.2215359
## - REB        1 -1629.5   1.94 0.1640334
## - BLKA       1 -1629.5   1.96 0.1610329
## <none>         -1629.5
```

```
## - PFD        1 -1629.3   2.17 0.1404397
## - OREB       1 -1629.0   2.41 0.1204947
## - DREB       1 -1629.0   2.47 0.1163292
## - FTP        1 -1628.5   2.94 0.0861702 .
## - TEAM      33 -1628.3  67.17 0.0004031 ***
## - FTA        1 -1628.2   3.24 0.0718287 .
## - FTM        1 -1627.3   4.20 0.0405098 *
## - TOV        1 -1625.0   6.46 0.0110299 *
## - STL        1 -1624.4   7.08 0.0078033 **
## - FGP        1 -1623.0   8.47 0.0036162 **
## - PlusMinus  1 -1246.9 384.59 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1737.245
## GAMLSS-RS iteration 2: Global Deviance = -1737.245
##
## Step:  AIC=-1631.25
## WINP ~ TEAM + PTS + FGM + FGP + `3PM` + `3PP` + FTM + FTA + FTP +
##     OREB + DREB + REB + AST + TOV + STL + BLKA + PF + PFD + PlusMinus
##
## trying - TEAM
## trying - PTS
## trying - FGM
## trying - FGP
## trying - `3PM`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLKA
## trying - PF
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT   Pr(Chi)
## - FGM        1 -1632.9   0.39 0.5329917
## - PTS        1 -1632.5   0.73 0.3938698
## - `3PM`      1 -1632.5   0.74 0.3908199
## - AST        1 -1632.2   1.10 0.2942560
## - PF         1 -1631.8   1.42 0.2336679
## - BLKA       1 -1631.3   1.96 0.1617403
## <none>         -1631.2
## - REB        1 -1631.2   2.01 0.1567578
## - `3PP`      1 -1631.2   2.01 0.1566737
## - PFD        1 -1631.0   2.27 0.1320217
## - OREB       1 -1630.8   2.49 0.1149099
## - DREB       1 -1630.7   2.56 0.1097689
## - FTP        1 -1630.0   3.29 0.0696110 .
## - FTA        1 -1629.7   3.56 0.0591219 .
```

```
## - FTM        1 -1628.9   4.30 0.0381056 *
## - TEAM      33 -1628.8  68.48 0.0002788 ***
## - TOV        1 -1626.5   6.71 0.0095834 **
## - STL        1 -1625.7   7.59 0.0058683 **
## - FGP        1 -1624.8   8.45 0.0036425 **
## - PlusMinus  1 -1244.9 388.36 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1736.857
## GAMLSS-RS iteration 2: Global Deviance = -1736.857
##
## Step:  AIC=-1632.86
## WINP ~ TEAM + PTS + FGP + `3PM` + `3PP` + FTM + FTA + FTP + OREB +
##     DREB + REB + AST + TOV + STL + BLKA + PF + PFD + PlusMinus
##
## trying - TEAM
## trying - PTS
## trying - FGP
## trying - `3PM`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - AST
## trying - TOV
## trying - STL
## trying - BLKA
## trying - PF
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT   Pr(Chi)
## - AST        1 -1633.7   1.12  0.289576
## - PF         1 -1633.5   1.37  0.241970
## - REB        1 -1633.0   1.85  0.173815
## - BLKA       1 -1632.9   1.92  0.165412
## <none>         -1632.9
## - `3PP`      1 -1632.8   2.01  0.156537
## - OREB       1 -1632.5   2.32  0.127560
## - DREB       1 -1632.5   2.39  0.121818
## - PFD        1 -1632.3   2.52  0.112696
## - `3PM`      1 -1631.7   3.12  0.077550 .
## - FTP        1 -1631.1   3.79  0.051496 .
## - TEAM      33 -1630.8  68.11  0.000310 ***
## - FTA        1 -1630.7   4.16  0.041510 *
## - FTM        1 -1630.2   4.61  0.031739 *
## - TOV        1 -1628.0   6.85  0.008859 **
## - PTS        1 -1627.4   7.50  0.006182 **
## - STL        1 -1627.2   7.68  0.005582 **
## - FGP        1 -1625.8   9.01  0.002679 **
## - PlusMinus  1 -1246.2 388.62 < 2.2e-16 ***
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1735.735
## GAMLSS-RS iteration 2: Global Deviance = -1735.735
##
## Step:  AIC=-1633.73
## WINP ~ TEAM + PTS + FGP + `3PM` + `3PP` + FTM + FTA + FTP + OREB +
##     DREB + REB + TOV + STL + BLKA + PF + PFD + PlusMinus
##
## trying - TEAM
## trying - PTS
## trying - FGP
## trying - `3PM`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - TOV
## trying - STL
## trying - BLKA
## trying - PF
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT   Pr(Chi)
## - PF         1 -1634.1   1.65  0.198387
## - `3PP`      1 -1634.0   1.71  0.190943
## - BLKA       1 -1633.8   1.99  0.158761
## <none>         -1633.7
## - REB        1 -1633.7   2.06  0.150810
## - OREB       1 -1633.2   2.52  0.112697
## - DREB       1 -1633.1   2.61  0.106040
## - `3PM`      1 -1633.0   2.69  0.100724
## - PFD        1 -1632.8   2.96  0.085365 .
## - TEAM      33 -1632.8  66.99  0.000425 ***
## - FTP        1 -1631.9   3.81  0.051031 .
## - FTA        1 -1631.4   4.30  0.038206 *
## - FTM        1 -1631.2   4.55  0.032920 *
## - TOV        1 -1629.8   5.90  0.015111 *
## - PTS        1 -1629.3   6.44  0.011132 *
## - STL        1 -1628.1   7.60  0.005839 **
## - FGP        1 -1626.8   8.97  0.002743 **
## - PlusMinus  1 -1241.4 394.32 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1734.081
## GAMLSS-RS iteration 2: Global Deviance = -1734.081
##
## Step:  AIC=-1634.08
## WINP ~ TEAM + PTS + FGP + `3PM` + `3PP` + FTM + FTA + FTP + OREB +
##     DREB + REB + TOV + STL + BLKA + PFD + PlusMinus
##
## trying - TEAM
```

```
## trying - PTS
## trying - FGP
## trying - `3PM`
## trying - `3PP`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - TOV
## trying - STL
## trying - BLKA
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT   Pr(Chi)
## - `3PP`      1 -1634.9   1.21 0.2713522
## - REB        1 -1634.2   1.87 0.1715264
## - BLKA       1 -1634.1   1.99 0.1587527
## <none>         -1634.1
## - PFD        1 -1633.8   2.32 0.1277033
## - OREB       1 -1633.7   2.35 0.1249765
## - DREB       1 -1633.6   2.45 0.1173303
## - FTP        1 -1632.4   3.71 0.0541210 .
## - `3PM`      1 -1632.3   3.74 0.0531352 .
## - FTA        1 -1631.8   4.24 0.0394254 *
## - FTM        1 -1631.5   4.53 0.0332125 *
## - TEAM      33 -1631.1  68.96 0.0002436 ***
## - STL        1 -1628.3   7.78 0.0052971 **
## - TOV        1 -1627.9   8.18 0.0042451 **
## - PTS        1 -1627.6   8.47 0.0036148 **
## - FGP        1 -1624.7  11.39 0.0007403 ***
## - PlusMinus  1 -1243.4 392.69 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1732.871
## GAMLSS-RS iteration 2: Global Deviance = -1732.871
##
## Step:  AIC=-1634.87
## WINP ~ TEAM + PTS + FGP + `3PM` + FTM + FTA + FTP + OREB + DREB +
##     REB + TOV + STL + BLKA + PFD + PlusMinus
##
## trying - TEAM
## trying - PTS
## trying - FGP
## trying - `3PM`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - TOV
## trying - STL
```

```
## trying - BLKA
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT   Pr(Chi)
## - BLKA       1 -1635.1   1.78 0.1819234
## - REB        1 -1635.0   1.87 0.1709658
## <none>         -1634.9
## - PFD        1 -1634.6   2.30 0.1293834
## - OREB       1 -1634.5   2.34 0.1258541
## - DREB       1 -1634.4   2.43 0.1191025
## - TEAM      33 -1632.9  67.99 0.0003202 ***
## - FTP        1 -1632.6   4.27 0.0388713 *
## - FTA        1 -1632.0   4.91 0.0266493 *
## - `3PM`      1 -1632.0   4.92 0.0265300 *
## - FTM        1 -1631.6   5.24 0.0220878 *
## - STL        1 -1629.9   6.96 0.0083423 **
## - TOV        1 -1628.8   8.09 0.0044402 **
## - PTS        1 -1627.6   9.31 0.0022802 **
## - FGP        1 -1624.0  12.92 0.0003255 ***
## - PlusMinus  1 -1224.5 412.36 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1731.089
## GAMLSS-RS iteration 2: Global Deviance = -1731.089
##
## Step:  AIC=-1635.09
## WINP ~ TEAM + PTS + FGP + `3PM` + FTM + FTA + FTP + OREB + DREB +
##     REB + TOV + STL + PFD + PlusMinus
##
## trying - TEAM
## trying - PTS
## trying - FGP
## trying - `3PM`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - REB
## trying - TOV
## trying - STL
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT   Pr(Chi)
## - REB        1 -1635.2   1.89 0.1688447
## <none>         -1635.1
## - TEAM      33 -1634.8  66.23 0.0005239 ***
## - OREB       1 -1634.7   2.35 0.1254629
## - DREB       1 -1634.7   2.44 0.1180605
## - PFD        1 -1634.5   2.58 0.1079932
## - FTP        1 -1632.9   4.21 0.0400840 *
## - FTA        1 -1632.2   4.88 0.0271393 *
## - FTM        1 -1631.9   5.17 0.0229430 *
## - `3PM`      1 -1630.7   6.37 0.0116287 *
```

```
## - STL        1 -1630.5   6.54 0.0105497 *
## - TOV        1 -1626.9  10.20 0.0014007 **
## - PTS        1 -1626.2  10.84 0.0009917 ***
## - FGP        1 -1622.0  15.08 0.0001032 ***
## - PlusMinus  1 -1217.4 419.69 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1729.196
## GAMLSS-RS iteration 2: Global Deviance = -1729.196
##
## Step:  AIC=-1635.2
## WINP ~ TEAM + PTS + FGP + `3PM` + FTM + FTA + FTP + OREB + DREB +
##     TOV + STL + PFD + PlusMinus
##
## trying - TEAM
## trying - PTS
## trying - FGP
## trying - `3PM`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - TOV
## trying - STL
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT   Pr(Chi)
## - TEAM      33 -1636.0  65.21 0.0006957 ***
## <none>         -1635.2
## - PFD        1 -1634.5   2.71 0.0996991 .
## - OREB       1 -1634.2   3.00 0.0830746 .
## - FTP        1 -1633.2   3.95 0.0469310 *
## - FTA        1 -1632.5   4.64 0.0312027 *
## - FTM        1 -1632.3   4.91 0.0266556 *
## - `3PM`      1 -1631.1   6.11 0.0134507 *
## - STL        1 -1630.9   6.34 0.0118281 *
## - DREB       1 -1628.3   8.91 0.0028340 **
## - TOV        1 -1627.3   9.93 0.0016289 **
## - PTS        1 -1626.6  10.61 0.0011232 **
## - FGP        1 -1622.3  14.85 0.0001161 ***
## - PlusMinus  1 -1219.1 418.14 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1663.991
## GAMLSS-RS iteration 2: Global Deviance = -1663.991
##
## Step:  AIC=-1635.99
## WINP ~ PTS + FGP + `3PM` + FTM + FTA + FTP + OREB + DREB + TOV +
##     STL + PFD + PlusMinus
##
## trying - PTS
## trying - FGP
## trying - `3PM`
```

```
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - TOV
## trying - STL
## trying - PFD
## trying - PlusMinus
##             Df     AIC    LRT   Pr(Chi)
## - PFD        1 -1636.8   1.17 0.2790867
## - FTP        1 -1636.5   1.45 0.2286680
## - OREB       1 -1636.4   1.55 0.2130826
## - FTA        1 -1636.2   1.81 0.1780492
## <none>         -1636.0
## - FTM        1 -1635.9   2.06 0.1516657
## - STL        1 -1634.6   3.43 0.0639013 .
## - `3PM`      1 -1633.2   4.77 0.0289174 *
## - TOV        1 -1631.7   6.26 0.0123340 *
## - DREB       1 -1630.9   7.12 0.0076105 **
## - PTS        1 -1629.5   8.49 0.0035763 **
## - FGP        1 -1626.8  11.24 0.0008008 ***
## - PlusMinus  1 -1189.8 448.16 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1662.819
## GAMLSS-RS iteration 2: Global Deviance = -1662.819
##
## Step:  AIC=-1636.82
## WINP ~ PTS + FGP + `3PM` + FTM + FTA + FTP + OREB + DREB + TOV +
##     STL + PlusMinus
##
## trying - PTS
## trying - FGP
## trying - `3PM`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - OREB
## trying - DREB
## trying - TOV
## trying - STL
## trying - PlusMinus
##             Df     AIC    LRT   Pr(Chi)
## - OREB       1 -1637.8   0.98  0.321162
## - FTP        1 -1637.7   1.13  0.287287
## - FTA        1 -1637.5   1.27  0.260050
## - FTM        1 -1637.2   1.60  0.205886
## <none>         -1636.8
## - STL        1 -1636.0   2.85  0.091378 .
## - `3PM`      1 -1634.8   3.98  0.046016 *
## - TOV        1 -1633.5   5.32  0.021051 *
## - DREB       1 -1632.6   6.18  0.012917 *
## - PTS        1 -1631.4   7.44  0.006395 **
```

```
## - FGP        1 -1628.7  10.08  0.001495 **
## - PlusMinus  1 -1161.6 477.20 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1661.835
## GAMLSS-RS iteration 2: Global Deviance = -1661.835
##
## Step:  AIC=-1637.83
## WINP ~ PTS + FGP + `3PM` + FTM + FTA + FTP + DREB + TOV + STL +
##     PlusMinus
##
## trying - PTS
## trying - FGP
## trying - `3PM`
## trying - FTM
## trying - FTA
## trying - FTP
## trying - DREB
## trying - TOV
## trying - STL
## trying - PlusMinus
##             Df      AIC    LRT   Pr(Chi)
## - FTA        1 -1638.66   1.17  0.279234
## - FTP        1 -1638.66   1.18  0.278205
## - FTM        1 -1638.44   1.40  0.236828
## - STL        1 -1637.96   1.88  0.170605
## <none>         -1637.83
## - `3PM`      1 -1636.05   3.78  0.051787 .
## - TOV        1 -1635.41   4.43  0.035406 *
## - DREB       1 -1633.81   6.03  0.014081 *
## - PTS        1 -1629.53  10.30  0.001327 **
## - FGP        1 -1622.94  16.90  3.95e-05 ***
## - PlusMinus  1  -905.38 734.45 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1660.664
## GAMLSS-RS iteration 2: Global Deviance = -1660.664
##
## Step:  AIC=-1638.66
## WINP ~ PTS + FGP + `3PM` + FTM + FTP + DREB + TOV + STL + PlusMinus
##
## trying - PTS
## trying - FGP
## trying - `3PM`
## trying - FTM
## trying - FTP
## trying - DREB
## trying - TOV
## trying - STL
## trying - PlusMinus
##             Df      AIC    LRT   Pr(Chi)
## - FTP        1 -1640.66   0.01  0.930028
## <none>         -1638.66
## - STL        1 -1638.66   2.00  0.156908
```

```
## - FTM        1 -1638.14   2.52  0.112385
## - `3PM`      1 -1637.16   3.51  0.061032 .
## - TOV        1 -1636.16   4.50  0.033882 *
## - DREB       1 -1634.83   5.84  0.015695 *
## - PTS        1 -1630.69   9.97  0.001587 **
## - FGP        1 -1624.32  16.34  5.28e-05 ***
## - PlusMinus  1  -907.33 733.33 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## GAMLSS-RS iteration 1: Global Deviance = -1660.657
## GAMLSS-RS iteration 2: Global Deviance = -1660.657
##
## Step:  AIC=-1640.66
## WINP ~ PTS + FGP + `3PM` + FTM + DREB + TOV + STL + PlusMinus
##
## trying - PTS
## trying - FGP
## trying - `3PM`
## trying - FTM
## trying - DREB
## trying - TOV
## trying - STL
## trying - PlusMinus
##             Df      AIC    LRT   Pr(Chi)
## <none>         -1640.66
## - STL        1 -1640.61   2.04  0.152896
## - FTM        1 -1640.11   2.54  0.110844
## - `3PM`      1 -1639.15   3.50  0.061257 .
## - TOV        1 -1637.95   4.70  0.030098 *
## - DREB       1 -1636.78   5.88  0.015345 *
## - PTS        1 -1632.59  10.06  0.001513 **
## - FGP        1 -1626.32  16.34 5.294e-05 ***
## - PlusMinus  1  -909.27 733.39 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Family:  c("NO", "Normal")
## Fitting method: RS()
##
## Call:  gamlss(formula = WINP ~ PTS + FGP + `3PM` + FTM + DREB +
##     TOV + STL + PlusMinus, family = NO, data = dados_regressao)
##
## Mu Coefficients:
## (Intercept)          PTS          FGP        `3PM`          FTM         DREB
##    0.226147    -0.003108     0.009672     0.003149     0.002312     0.003667
##         TOV          STL    PlusMinus
##   -0.004373     0.003764     0.029249
## Sigma Coefficients:
## (Intercept)
##      -3.264
##
##  Degrees of Freedom for the fit: 10 Residual Deg. of Freedom   440
## Global Deviance:     -1660.66
```

```
##             AIC:     -1640.66
##             SBC:     -1599.56
```

```
# Call:  gamlss(formula = WINP ~ PTS + FGP + PF + PlusMinus,      family = NO, data = dados_regressao)
#
# Mu Coefficients:
#   (Intercept)          PTS          FGP           PF    PlusMinus
# 0.4105976   -0.0006542    0.0048736   -0.0032414    0.0304204
# Sigma Coefficients:
#   (Intercept)
# -3.26
#
# Degrees of Freedom for the fit: 6 Residual Deg. of Freedom   444
# Global Deviance:     -1657.35
# AIC:     -1645.35
# SBC:     -1620.7
```

```
gamlss_normal_back <- gamlss(formula = WINP ~ PTS + FGP + PF + PlusMinus, family = NO, data = dados_reg
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1657.353
## GAMLSS-RS iteration 2: Global Deviance = -1657.353
```

```
gamlss_normal_back
```

```
##
## Family:  c("NO", "Normal")
## Fitting method: RS()
##
## Call:  gamlss(formula = WINP ~ PTS + FGP + PF + PlusMinus,
##     family = NO, data = dados_regressao)
##
## Mu Coefficients:
## (Intercept)          PTS          FGP           PF    PlusMinus
##   0.4105976   -0.0006542    0.0048736   -0.0032414    0.0304204
## Sigma Coefficients:
## (Intercept)
##       -3.26
##
##  Degrees of Freedom for the fit: 6 Residual Deg. of Freedom   444
## Global Deviance:     -1657.35
##             AIC:     -1645.35
##             SBC:     -1620.7
```

```
coef(gamlss_normal_back)
```

```
##   (Intercept)           PTS           FGP            PF     PlusMinus
##  0.4105975914 -0.0006542452  0.0048736395 -0.0032414270  0.0304203770
```

```
summary(gamlss_normal_back) #AIC:     -1645.353
```

```
## ******************************************************************
## Family:  c("NO", "Normal")
##
## Call:  gamlss(formula = WINP ~ PTS + FGP + PF + PlusMinus,
##     family = NO, data = dados_regressao)
##
## Fitting method: RS()
```

```
##
## ------------------------------------------------------------------
## Mu link function:  identity
## Mu Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.4105976  0.0711551   5.770 1.49e-08 ***
## PTS         -0.0006542  0.0003221  -2.031  0.04285 *
## FGP          0.0048736  0.0016875   2.888  0.00406 **
## PF          -0.0032414  0.0013059  -2.482  0.01343 *
## PlusMinus    0.0304204  0.0004963  61.289  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ------------------------------------------------------------------
## Sigma link function:  log
## Sigma Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -3.26044    0.03333  -97.81   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ------------------------------------------------------------------
## No. of observations in the fit:  450
## Degrees of Freedom for the fit:  6
##       Residual Deg. of Freedom:  444
##                       at cycle:  2
##
## Global Deviance:     -1657.353
##             AIC:     -1645.353
##             SBC:     -1620.698
## ******************************************************************
```

```
################ Análise ANOVA #############
##### Beta ######
modelo_gamlss1 #`3PP` + FTM + STL + PlusMinus
```

```
##
## Family:  c("BE", "Beta")
## Fitting method: RS()
##
## Call:  gamlss(formula = WINP ~ `3PP` + FTM + STL + PlusMinus,
##     family = BE, data = dados_regressao)
##
## Mu Coefficients:
## (Intercept)        `3PP`          FTM          STL    PlusMinus
##  -0.2405400    0.0081551   -0.0029726   -0.0004249    0.1341058
## Sigma Coefficients:
## (Intercept)
##      -2.444
##
##  Degrees of Freedom for the fit: 6 Residual Deg. of Freedom   444
## Global Deviance:     -1664.53
##             AIC:     -1652.53
##             SBC:     -1627.87
```

```
gamlss_beta_back #WINP ~ PTS + FGA + FGP + `3PA` + `3PP`+FTM + PF + PlusMinus
```

```
##
## Family:  c("BE", "Beta")
## Fitting method: RS()
##
## Call:  gamlss(formula = WINP ~ PTS + FGA + FGP + `3PA` + `3PP` +
##     FTM + PF + PlusMinus, family = BE, data = dados_regressao)
##
## Mu Coefficients:
## (Intercept)          PTS          FGA          FGP        `3PA`        `3PP`
##    -7.32808     -0.08135      0.07156      0.15412      0.02814      0.02426
##         FTM           PF    PlusMinus
##     0.07866     -0.01374      0.13087
## Sigma Coefficients:
## (Intercept)
##      -2.466
##
##  Degrees of Freedom for the fit: 10 Residual Deg. of Freedom   440
## Global Deviance:     -1682.93
##             AIC:     -1662.93
##             SBC:     -1621.84
```

```
gamlss_beta_forw #PlusMinus + FGP + PTS + PF, deu significativo
```

```
##
## Family:  c("BE", "Beta")
## Fitting method: RS()
##
## Call:  gamlss(formula = WINP ~ PlusMinus + FGP + PTS + PF,
##     family = BE, data = dados_regressao)
##
## Mu Coefficients:
## (Intercept)    PlusMinus          FGP          PTS           PF
##   -0.505065     0.131669     0.023267    -0.003065    -0.012155
## Sigma Coefficients:
## (Intercept)
##      -2.458
##
##  Degrees of Freedom for the fit: 6 Residual Deg. of Freedom   444
## Global Deviance:     -1676.84
##             AIC:     -1664.84
##             SBC:     -1640.19
```

```
modelo_beta0 <- gamlss(WINP ~ 1, data = dados_regressao, family = BE)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -440.3197
## GAMLSS-RS iteration 2: Global Deviance = -440.3212
## GAMLSS-RS iteration 3: Global Deviance = -440.3212
```

```
modelo_beta_plus <- gamlss(WINP ~ PlusMinus, data = dados_regressao, family = BE)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1315.679
## GAMLSS-RS iteration 2: Global Deviance = -1660.864
## GAMLSS-RS iteration 3: Global Deviance = -1661.349
## GAMLSS-RS iteration 4: Global Deviance = -1661.349
```

```r
modelo_beta_fgp <- gamlss(WINP ~ PlusMinus + FGP, data = dados_regressao, family = BE)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1317.833
## GAMLSS-RS iteration 2: Global Deviance = -1666.409
## GAMLSS-RS iteration 3: Global Deviance = -1666.902
## GAMLSS-RS iteration 4: Global Deviance = -1666.902
```

```r
modelo_beta_pts <- gamlss(WINP ~ PlusMinus + FGP + PTS, data = dados_regressao, family = BE)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1319.722
## GAMLSS-RS iteration 2: Global Deviance = -1671.714
## GAMLSS-RS iteration 3: Global Deviance = -1672.217
## GAMLSS-RS iteration 4: Global Deviance = -1672.217
```

```r
modelo_beta_pf <- gamlss(WINP ~ PlusMinus + FGP + PTS + PF, data = dados_regressao, family = BE)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1321.858
## GAMLSS-RS iteration 2: Global Deviance = -1676.336
## GAMLSS-RS iteration 3: Global Deviance = -1676.843
## GAMLSS-RS iteration 4: Global Deviance = -1676.843
```

```r
modelo_beta_pf_ftm <- gamlss(WINP ~ PlusMinus + FGP + PTS + PF + FTM, data = dados_regressao, family = B
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1321.858
## GAMLSS-RS iteration 2: Global Deviance = -1676.336
## GAMLSS-RS iteration 3: Global Deviance = -1676.843
## GAMLSS-RS iteration 4: Global Deviance = -1676.843
```

```r
modelo_beta_pf_3pp <- gamlss(WINP ~ PlusMinus + FGP + PTS + PF + `3PP`, data = dados_regressao, family =
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1322.292
## GAMLSS-RS iteration 2: Global Deviance = -1677.531
## GAMLSS-RS iteration 3: Global Deviance = -1678.04
## GAMLSS-RS iteration 4: Global Deviance = -1678.04
```

```r
modelo_beta_pf_3pa <- gamlss(WINP ~ PlusMinus + FGP + PTS + PF + `3PA`, data = dados_regressao, family =
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1322.014
## GAMLSS-RS iteration 2: Global Deviance = -1676.595
## GAMLSS-RS iteration 3: Global Deviance = -1677.101
## GAMLSS-RS iteration 4: Global Deviance = -1677.101
```

```r
modelo_beta_pf_fga <- gamlss(WINP ~ PlusMinus + FGP + PTS + PF + FGA, data = dados_regressao, family = B
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1321.949
## GAMLSS-RS iteration 2: Global Deviance = -1676.469
## GAMLSS-RS iteration 3: Global Deviance = -1676.975
## GAMLSS-RS iteration 4: Global Deviance = -1676.975
```

```r
modelo_beta_stl <- gamlss(WINP ~ PlusMinus + STL, data = dados_regressao, family = BE)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1315.706
## GAMLSS-RS iteration 2: Global Deviance = -1660.975
## GAMLSS-RS iteration 3: Global Deviance = -1661.46
## GAMLSS-RS iteration 4: Global Deviance = -1661.46
```

```r
modelo_beta_3pp <- gamlss(WINP ~ PlusMinus + `3PP`, data = dados_regressao, family = BE)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1316.735
```

```
## GAMLSS-RS iteration 2: Global Deviance = -1663.605
## GAMLSS-RS iteration 3: Global Deviance = -1664.094
## GAMLSS-RS iteration 4: Global Deviance = -1664.094
```

```
modelo_beta_ftm <- gamlss(WINP ~ PlusMinus + `3PP` + FTM, data = dados_regressao, family = BE)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1316.912
## GAMLSS-RS iteration 2: Global Deviance = -1664.034
## GAMLSS-RS iteration 3: Global Deviance = -1664.524
## GAMLSS-RS iteration 4: Global Deviance = -1664.524
```

```
lrtest(modelo_beta0, modelo_beta_plus) #2.2e-16 plusMinus deu significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP ~ 1
## Model 2: WINP ~ PlusMinus
##   #Df LogLik Df Chisq Pr(>Chisq)
## 1   2 220.16
## 2   3 830.67  1  1221  < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
lrtest(modelo_beta_plus, modelo_beta_fgp)#0.01844, FGP significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP ~ PlusMinus
## Model 2: WINP ~ PlusMinus + FGP
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   3 830.67
## 2   4 833.45  1 5.5537    0.01844 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
lrtest(modelo_beta_fgp, modelo_beta_pts)#0.02115, PTS significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP ~ PlusMinus + FGP
## Model 2: WINP ~ PlusMinus + FGP + PTS
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 833.45
## 2   5 836.11  1 5.3144    0.02115 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
lrtest(modelo_beta_pts, modelo_beta_pf)#0.03149, PF significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP ~ PlusMinus + FGP + PTS
## Model 2: WINP ~ PlusMinus + FGP + PTS + PF
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   5 836.11
## 2   6 838.42  1 4.6262    0.03149 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```r
lrtest(modelo_beta_pf, modelo_beta_pf_ftm)#0.9896, FTM não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP ~ PlusMinus + FGP + PTS + PF
## Model 2: WINP ~ PlusMinus + FGP + PTS + PF + FTM
##   #Df LogLik Df Chisq Pr(>Chisq)
## 1   6 838.42
## 2   7 838.42  1 2e-04     0.9896
```

```r
lrtest(modelo_beta_pf, modelo_beta_pf_3pp)#0.274, 3pp não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP ~ PlusMinus + FGP + PTS + PF
## Model 2: WINP ~ PlusMinus + FGP + PTS + PF + `3PP`
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   6 838.42
## 2   7 839.02  1 1.1966      0.274
```

```r
lrtest(modelo_beta_pf, modelo_beta_pf_3pa)#0.6111, 3pa não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP ~ PlusMinus + FGP + PTS + PF
## Model 2: WINP ~ PlusMinus + FGP + PTS + PF + `3PA`
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   6 838.42
## 2   7 838.55  1 0.2585     0.6111
```

```r
lrtest(modelo_beta_pf, modelo_beta_pf_fga)#0.716, FGA não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP ~ PlusMinus + FGP + PTS + PF
## Model 2: WINP ~ PlusMinus + FGP + PTS + PF + FGA
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   6 838.42
## 2   7 838.49  1 0.1324      0.716
```

```r
lrtest(modelo_beta_plus, modelo_beta_stl) #0.7386 STL deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP ~ PlusMinus
## Model 2: WINP ~ PlusMinus + STL
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   3 830.67
## 2   4 830.73  1 0.1114     0.7386
```

```r
lrtest(modelo_beta_plus, modelo_beta_3pp) #0.09752 3PP deu significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP ~ PlusMinus
## Model 2: WINP ~ PlusMinus + `3PP`
##   #Df LogLik Df  Chisq Pr(>Chisq)
```

```
## 1   3 830.67
## 2   4 832.05  1 2.7456    0.09752 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
lrtest(modelo_beta_3pp, modelo_beta_ftm) #0.5123 FTM deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP ~ PlusMinus + `3PP`
## Model 2: WINP ~ PlusMinus + `3PP` + FTM
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 832.05
## 2   5 832.26  1 0.4294     0.5123
```

```
#gamlss_beta_forw foi o melhor modelo analisado

##### Normal ######
modelo_gamlssN1 #TOV + STL + PF + PlusMinus
```

```
##
## Family:  c("NO", "Normal")
## Fitting method: RS()
##
## Call:  gamlss(formula = WINP ~ TOV + STL + PF + PlusMinus,
##     family = NO, data = dados_regressao)
##
## Mu Coefficients:
## (Intercept)          TOV          STL           PF    PlusMinus
##   5.650e-01   -4.755e-05    5.647e-04   -3.392e-03    3.107e-02
## Sigma Coefficients:
## (Intercept)
##      -3.251
##
##  Degrees of Freedom for the fit: 6 Residual Deg. of Freedom   444
## Global Deviance:     -1648.78
##             AIC:     -1636.78
##             SBC:     -1612.12
```

```
gamlss_normal_back #PTS + FGP + PF + PlusMinus
```

```
##
## Family:  c("NO", "Normal")
## Fitting method: RS()
##
## Call:  gamlss(formula = WINP ~ PTS + FGP + PF + PlusMinus,
##     family = NO, data = dados_regressao)
##
## Mu Coefficients:
## (Intercept)          PTS          FGP           PF    PlusMinus
##   0.4105976   -0.0006542    0.0048736   -0.0032414    0.0304204
## Sigma Coefficients:
## (Intercept)
##       -3.26
##
##  Degrees of Freedom for the fit: 6 Residual Deg. of Freedom   444
```

```
## Global Deviance:     -1657.35
##             AIC:     -1645.35
##             SBC:     -1620.7
```

```
gamlss_normal_forw #PlusMinus + PF + FGP + FGM
```

```
##
## Family:  c("NO", "Normal")
## Fitting method: RS()
##
## Call:  gamlss(formula = WINP ~ PlusMinus + PF + FGP + FGM,
##     family = NO, data = dados_regressao)
##
## Mu Coefficients:
## (Intercept)    PlusMinus           PF          FGP          FGM
##    0.401565     0.030261    -0.003478     0.005746    -0.002433
## Sigma Coefficients:
## (Intercept)
##      -3.262
##
##  Degrees of Freedom for the fit: 6 Residual Deg. of Freedom   444
## Global Deviance:     -1658.44
##             AIC:     -1646.44
##             SBC:     -1621.78
```

```
modelo_normal0 <- gamlss(formula = WINP ~1, family = NO, data = dados_regressao)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -427.5666
## GAMLSS-RS iteration 2: Global Deviance = -427.5666
```

```
modelo_normal_plusMinus <- gamlss(formula = WINP ~ PlusMinus, family = NO, data = dados_regressao)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1642.391
## GAMLSS-RS iteration 2: Global Deviance = -1642.391
```

```
modelo_normal_pf <- gamlss(formula = WINP ~ PlusMinus + PF, family = NO, data = dados_regressao)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1648.718
## GAMLSS-RS iteration 2: Global Deviance = -1648.718
```

```
modelo_normal_fgp <- gamlss(formula = WINP ~ PlusMinus + PF + FGP, family = NO, data = dados_regressao)
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1653.247
## GAMLSS-RS iteration 2: Global Deviance = -1653.247
```

```
modelo_normal_stl <- gamlss(formula = WINP ~ PlusMinus + PF + FGP + STL, family = NO, data = dados_regr
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1653.306
## GAMLSS-RS iteration 2: Global Deviance = -1653.306
```

```
modelo_normal_tov <- gamlss(formula = WINP ~ PlusMinus + PF + FGP + TOV, family = NO, data = dados_regr
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1653.3
## GAMLSS-RS iteration 2: Global Deviance = -1653.3
```

```
modelo_normal_fgm <- gamlss(formula = WINP ~ PlusMinus + PF + FGP + FGM, family = NO, data = dados_regr
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1658.44
## GAMLSS-RS iteration 2: Global Deviance = -1658.44
```

```r
modelo_normal_pts <- gamlss(formula = WINP ~ PlusMinus + PF + FGP + PTS, family = NO, data = dados_regr
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1657.353
## GAMLSS-RS iteration 2: Global Deviance = -1657.353
```

```r
modelo_normal_ptsfgm <- gamlss(formula = WINP ~ PlusMinus + PF + FGP + PTS + FGM, family = NO, data = da
```

```
## GAMLSS-RS iteration 1: Global Deviance = -1658.444
## GAMLSS-RS iteration 2: Global Deviance = -1658.444
```

```r
lrtest(modelo_normal0, modelo_normal_plusMinus) #2.2e-16, plusminus deu significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP ~ 1
## Model 2: WINP ~ PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   2 213.78
## 2   3 821.20  1 1214.8  < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```r
lrtest(modelo_normal_plusMinus, modelo_normal_pf) #0.01189, PF deu significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP ~ PlusMinus
## Model 2: WINP ~ PlusMinus + PF
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   3 821.20
## 2   4 824.36  1 6.3266    0.01189 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```r
lrtest(modelo_normal_pf, modelo_normal_fgp) #0.03331, FGP deu significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP ~ PlusMinus + PF
## Model 2: WINP ~ PlusMinus + PF + FGP
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 824.36
## 2   5 826.62  1 4.5296    0.03331 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```r
lrtest(modelo_normal_fgp, modelo_normal_stl) #0.8083, STL deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP ~ PlusMinus + PF + FGP
## Model 2: WINP ~ PlusMinus + PF + FGP + STL
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   5 826.62
## 2   6 826.65  1 0.0589     0.8083
```

```r
lrtest(modelo_normal_fgp, modelo_normal_tov) #0.8184, TOV deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP ~ PlusMinus + PF + FGP
## Model 2: WINP ~ PlusMinus + PF + FGP + TOV
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   5 826.62
## 2   6 826.65  1 0.0527     0.8184
```

```
lrtest(modelo_normal_fgp, modelo_normal_fgm) #0.02268, FGM deu significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP ~ PlusMinus + PF + FGP
## Model 2: WINP ~ PlusMinus + PF + FGP + FGM
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   5 826.62
## 2   6 829.22  1 5.1928    0.02268 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
lrtest(modelo_normal_fgp, modelo_normal_pts) #0.04273, PTS deu significativo
```

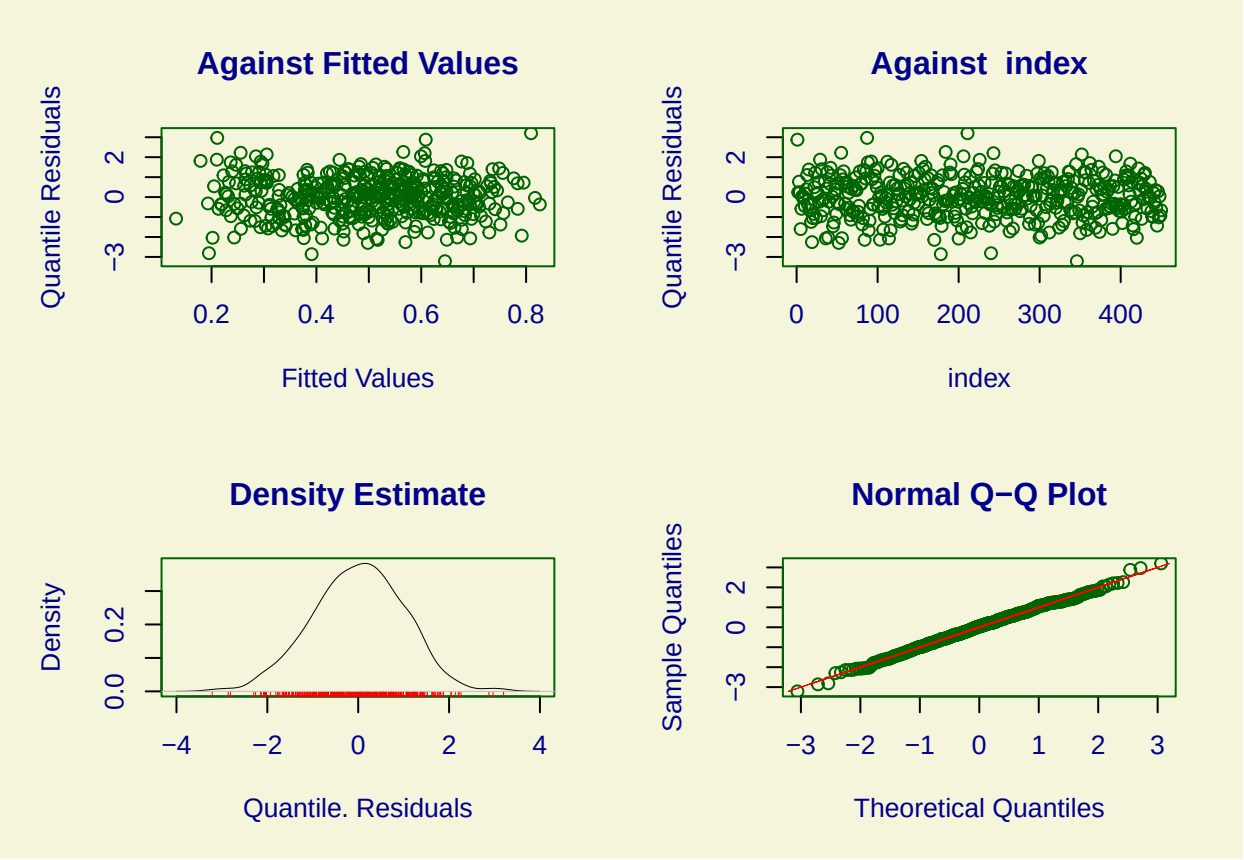
```
## Likelihood ratio test
##
## Model 1: WINP ~ PlusMinus + PF + FGP
## Model 2: WINP ~ PlusMinus + PF + FGP + PTS
##   #Df LogLik Df Chisq Pr(>Chisq)
## 1   5 826.62
## 2   6 828.68  1 4.106    0.04273 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
lrtest(modelo_normal_pts, modelo_normal_ptsfgm) #0.2963, PTS e FGM juntos não deram siginificativos
```

```
## Likelihood ratio test
##
## Model 1: WINP ~ PlusMinus + PF + FGP + PTS
## Model 2: WINP ~ PlusMinus + PF + FGP + PTS + FGM
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   6 828.68
## 2   7 829.22  1 1.0906     0.2963
```

```
#Melhores modelos são backward e forward.

############### Análise de Resíduos ###############
##### Beta #####
###### Modelo Completo #######
plot(modelo_gamlss)
```




```
## ****************************************************************
##        Summary of the Quantile Residuals
##                             mean   =  0.001942134
##                         variance   =  1.002264
##                 coef. of skewness  =  -0.08444201
##                 coef. of kurtosis  =  3.07018
## Filliben correlation coefficient   =  0.9987175
## ****************************************************************
```

```
shapiro.test(modelo_gamlss$residuals) #p-value = 0.2651, normal
```

```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_gamlss$residuals
## W = 0.99755, p-value = 0.7539
```

```
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_gamlss) #p-value = 0.2282
```

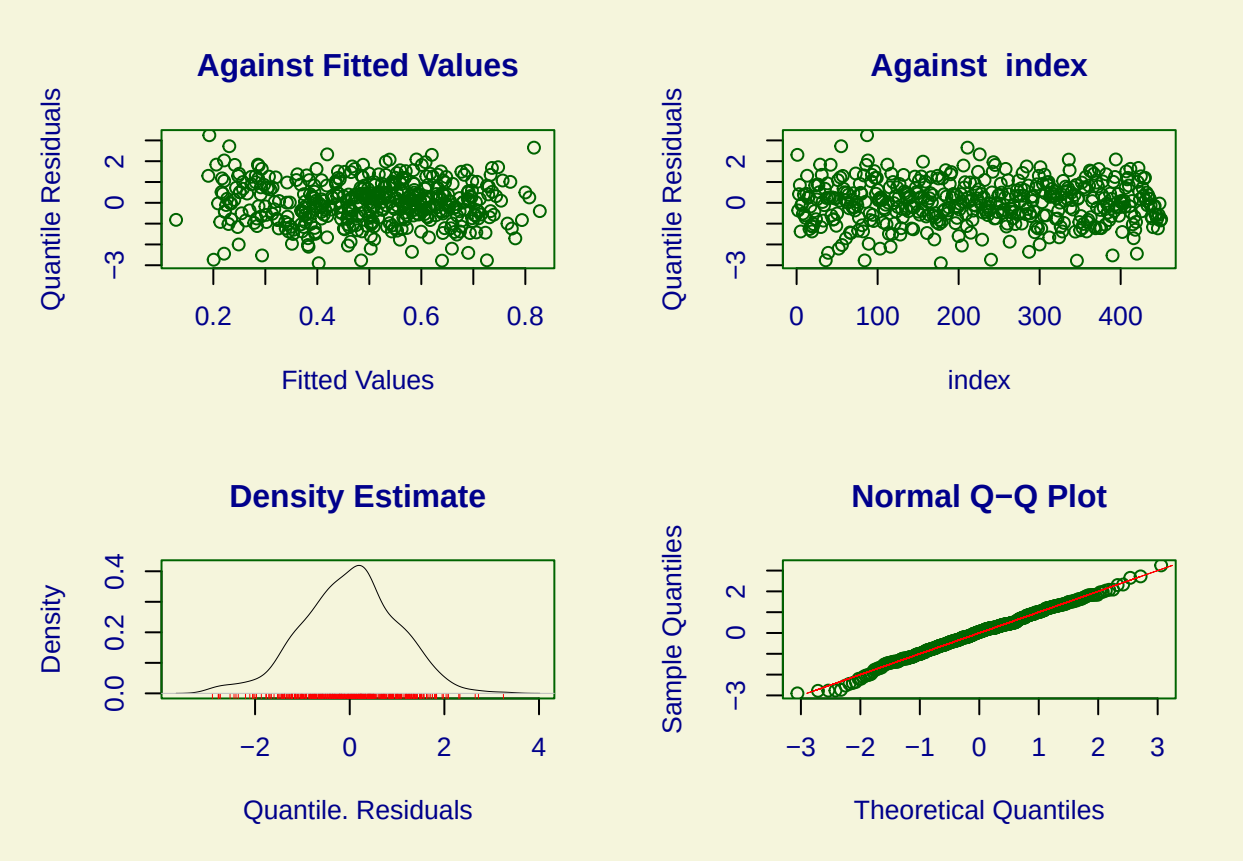
```
##
##  Durbin-Watson test
##
## data:  modelo_gamlss
## DW = 1.9425, p-value = 0.09558
## alternative hypothesis: true autocorrelation is greater than 0
```

```r
#Independência
plot(modelo_gamlss$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```


```r
#Breusch_Pagan para homocedasticdade
bptest(modelo_gamlss) #p-value = 0.04578
```

```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_gamlss
## BP = 67.811, df = 68, p-value = 0.4837
```

```r
###### Modelo 10% #######
plot(modelo_gamlss1)
```




```
## ****************************************************************
##        Summary of the Quantile Residuals
##                             mean   =  0.003646082
##                         variance   =  1.002494
##                 coef. of skewness  =  -0.1241129
##                 coef. of kurtosis  =  3.16992
## Filliben correlation coefficient   =  0.9981985
## ****************************************************************
```

```
shapiro.test(modelo_gamlss1$residuals) #p-value = 0.3737, normal
```

```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_gamlss1$residuals
## W = 0.99625, p-value = 0.3718
```

```
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_gamlss1) #p-value = 0.2548
```

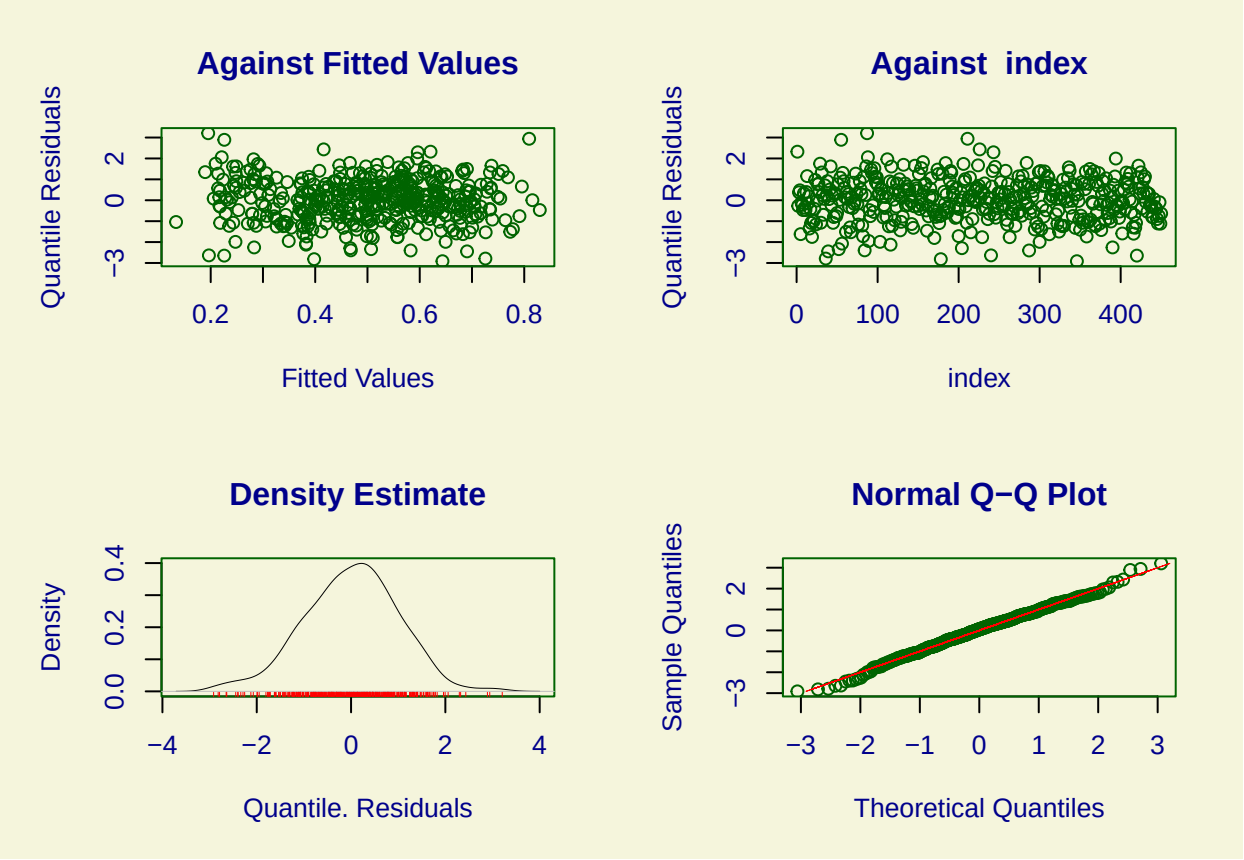
```
##
##  Durbin-Watson test
##
## data:  modelo_gamlss1
## DW = 1.9425, p-value = 0.2544
## alternative hypothesis: true autocorrelation is greater than 0
```

```r
#Independência
plot(modelo_gamlss1$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```


```r
#Breusch_Pagan para homocedasticdade
bptest(modelo_gamlss1) #p-value = 0.09055 , homocedastico
```

```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_gamlss1
## BP = 6.532, df = 4, p-value = 0.1628
```

```r
##### Forward ####
plot(gamlss_beta_forw)
```




```
## ****************************************************************
##        Summary of the Quantile Residuals
##                             mean   =  0.003493076
##                         variance   =  1.002508
##                 coef. of skewness  =  -0.1366816
##                 coef. of kurtosis  =  3.200036
## Filliben correlation coefficient   =  0.9980074
## ****************************************************************
```

```
shapiro.test(gamlss_beta_forw$residuals) #p-value = 0.2853, normal
```

```
##
##  Shapiro-Wilk normality test
##
## data:  gamlss_beta_forw$residuals
## W = 0.99586, p-value = 0.2853
```

```
#Teste de durbin watson para independencia
library(lmtest)
dwtest(gamlss_beta_forw) #p-value = 0.1735
```

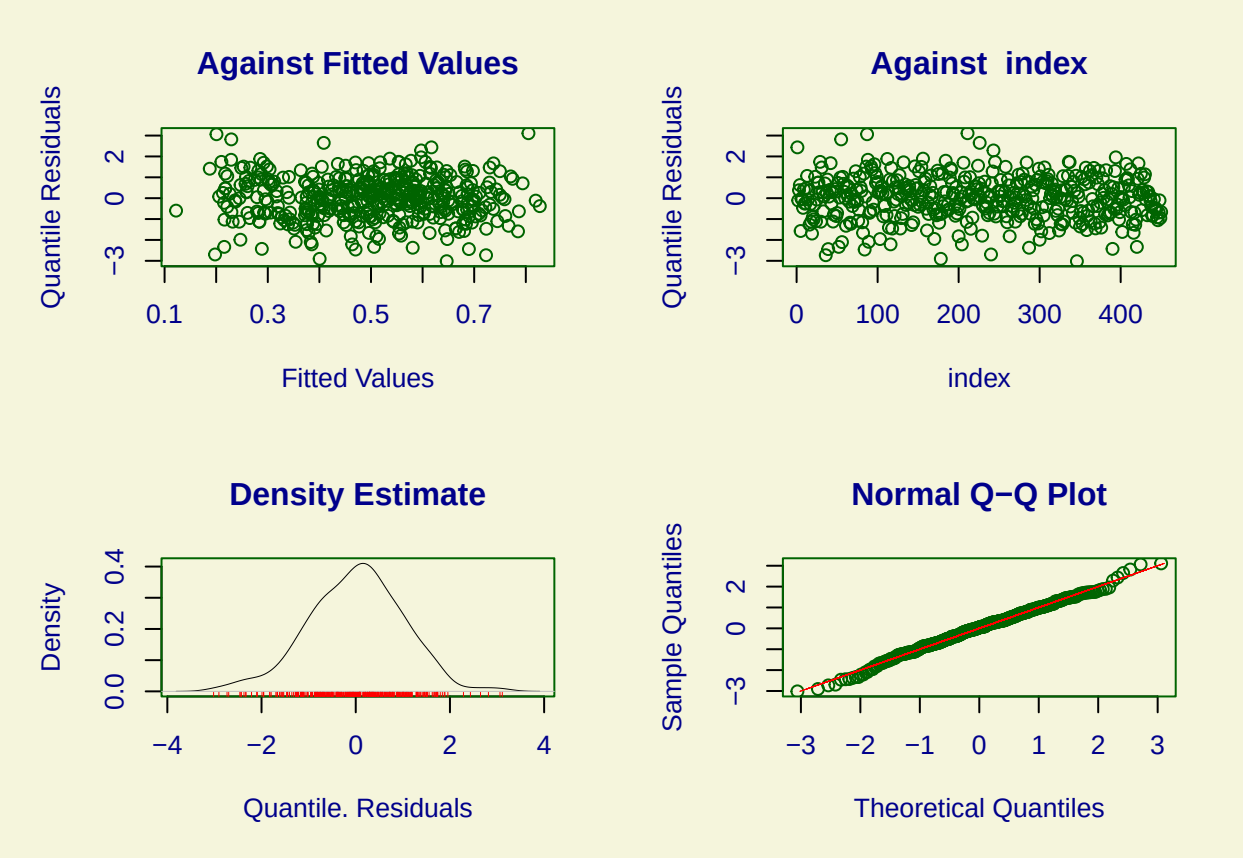
```
##
##  Durbin-Watson test
##
## data:  gamlss_beta_forw
## DW = 1.9193, p-value = 0.1735
## alternative hypothesis: true autocorrelation is greater than 0
```

```r
#Independência
plot(gamlss_beta_forw$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```


```r
#Breusch_Pagan para homocedasticdade
bptest(gamlss_beta_forw) #p-value = 0.0006407
```

```
##
##  studentized Breusch-Pagan test
##
## data:  gamlss_beta_forw
## BP = 19.451, df = 4, p-value = 0.0006407
```

```r
##### Bacward ####
plot(gamlss_beta_back)
```




```
## ****************************************************************
##        Summary of the Quantile Residuals
##                             mean   =  0.002461363
##                         variance   =  1.002478
##                 coef. of skewness  =  -0.127312
##                 coef. of kurtosis  =  3.257866
## Filliben correlation coefficient   =  0.9978309
## ****************************************************************
```

```
shapiro.test(gamlss_beta_back$residuals) #p-value = 0.2253, normal
```

```
##
##  Shapiro-Wilk normality test
##
## data:  gamlss_beta_back$residuals
## W = 0.99552, p-value = 0.2253
```

```
#Teste de durbin watson para independencia
library(lmtest)
dwtest(gamlss_beta_back) #p-value = 0.2641
```

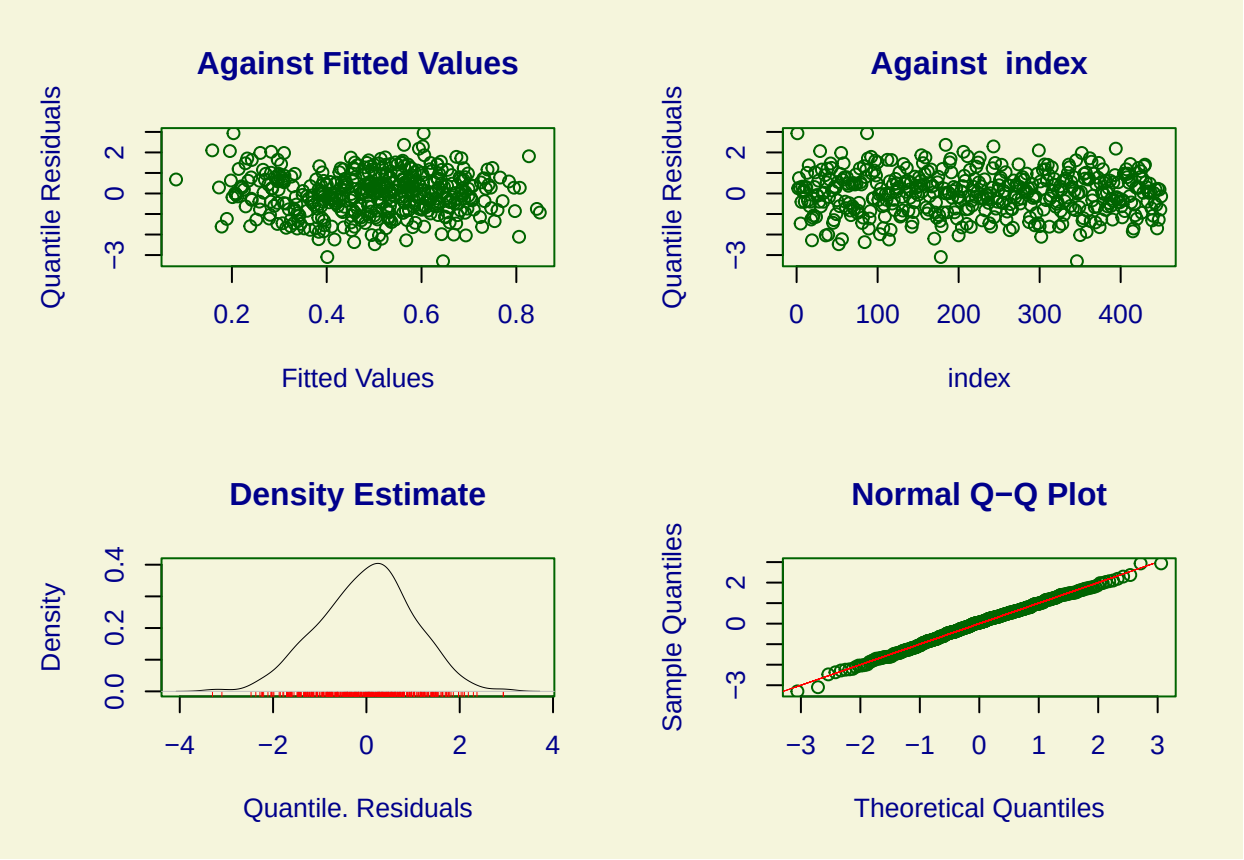
```
##
##  Durbin-Watson test
##
## data:  gamlss_beta_back
## DW = 1.951, p-value = 0.2641
## alternative hypothesis: true autocorrelation is greater than 0
```

```r
#Independência
plot(gamlss_beta_back$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```


```r
#Breusch_Pagan para homocedasticdade
bptest(gamlss_beta_back) #p-value = 0.01486
```

```
##
##  studentized Breusch-Pagan test
##
## data:  gamlss_beta_back
## BP = 19.001, df = 8, p-value = 0.01486
```

```r
##### Normal #####
###### Modelo Completo #######
plot(modelo_gamlssN)
```




```
## ****************************************************************
##        Summary of the Quantile Residuals
##                             mean   =  -9.509516e-17
##                         variance   =  1.002227
##                 coef. of skewness  =  -0.1485356
##                 coef. of kurtosis  =  2.987305
## Filliben correlation coefficient   =  0.9985421
## ****************************************************************
```

```
shapiro.test(modelo_gamlssN$residuals) #p-value = 0.1997, normal
```

```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_gamlssN$residuals
## W = 0.99713, p-value = 0.6228
```

```
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_gamlssN) #p-value = 0.2282
```

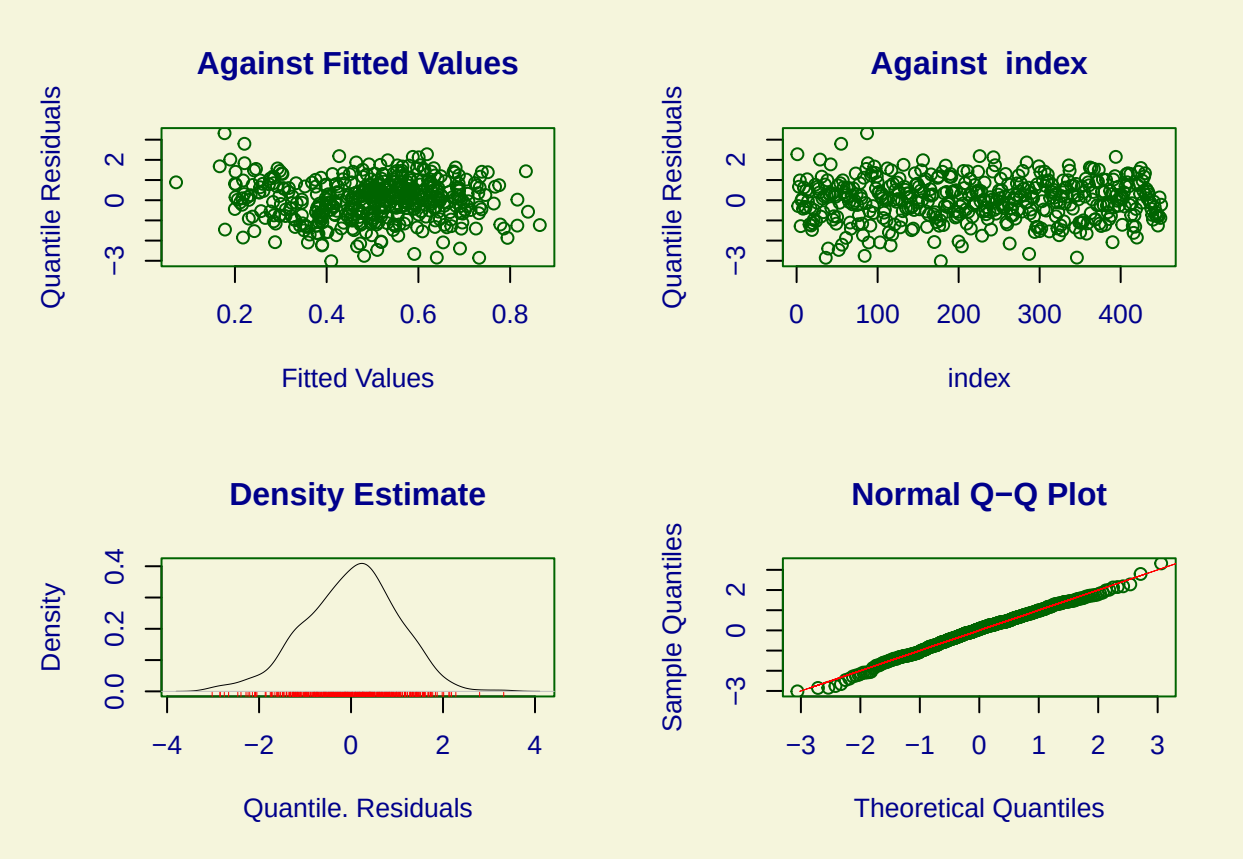
```
##
##  Durbin-Watson test
##
## data:  modelo_gamlssN
## DW = 1.9425, p-value = 0.09558
## alternative hypothesis: true autocorrelation is greater than 0
```

```r
#Independência
plot(modelo_gamlssN$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```


```r
#Breusch_Pagan para homocedasticdade
bptest(modelo_gamlssN) #p-value = 0.04578
```

```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_gamlssN
## BP = 67.811, df = 68, p-value = 0.4837
```

```r
###### Modelo Normal 10% #######
plot(modelo_gamlssN1)
```




```
## ****************************************************************
##        Summary of the Quantile Residuals
##                             mean   =  -2.990907e-16
##                         variance   =  1.002227
##                coef. of skewness   =  -0.2039986
##                coef. of kurtosis   =  3.10844
## Filliben correlation coefficient   =  0.9975946
## ****************************************************************
```

```
shapiro.test(modelo_gamlssN1$residuals) #p-value = 0.1847, normal
```

```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_gamlssN1$residuals
## W = 0.99524, p-value = 0.1846
```

```
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_gamlssN1) #p-value = 0.2497
```

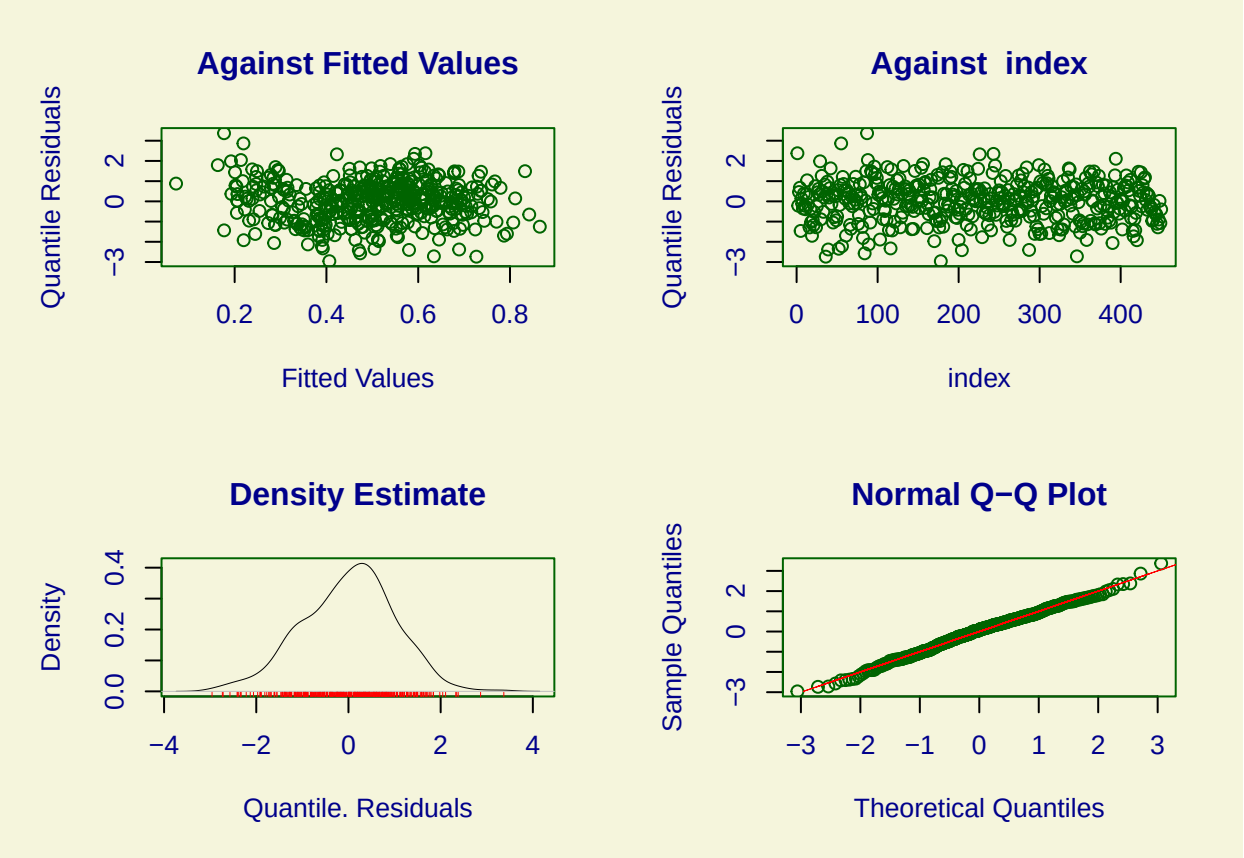
```
##
##  Durbin-Watson test
##
## data:  modelo_gamlssN1
## DW = 1.9403, p-value = 0.248
## alternative hypothesis: true autocorrelation is greater than 0
```

```r
#Independência
plot(modelo_gamlssN1$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```


```r
#Breusch_Pagan para homocedasticdade
bptest(modelo_gamlssN1) #p-value = 0.001367
```

```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_gamlssN1
## BP = 15.725, df = 4, p-value = 0.003411
```

```r
##### Forward Normal  ####
plot(gamlss_normal_forw)
```




```
## ****************************************************************
##        Summary of the Quantile Residuals
##                             mean   =  -6.177916e-16
##                         variance   =  1.002227
##                 coef. of skewness  =  -0.1543876
##                 coef. of kurtosis  =  3.054637
## Filliben correlation coefficient   =  0.9977486
## ****************************************************************
```

```
shapiro.test(gamlss_normal_forw$residuals) #p-value = 0.2296, normal
```

```
##
##  Shapiro-Wilk normality test
##
## data:  gamlss_normal_forw$residuals
## W = 0.99555, p-value = 0.2296
```

```
#Teste de durbin watson para independencia
library(lmtest)
dwtest(gamlss_normal_forw) #p-value =  0.195
```

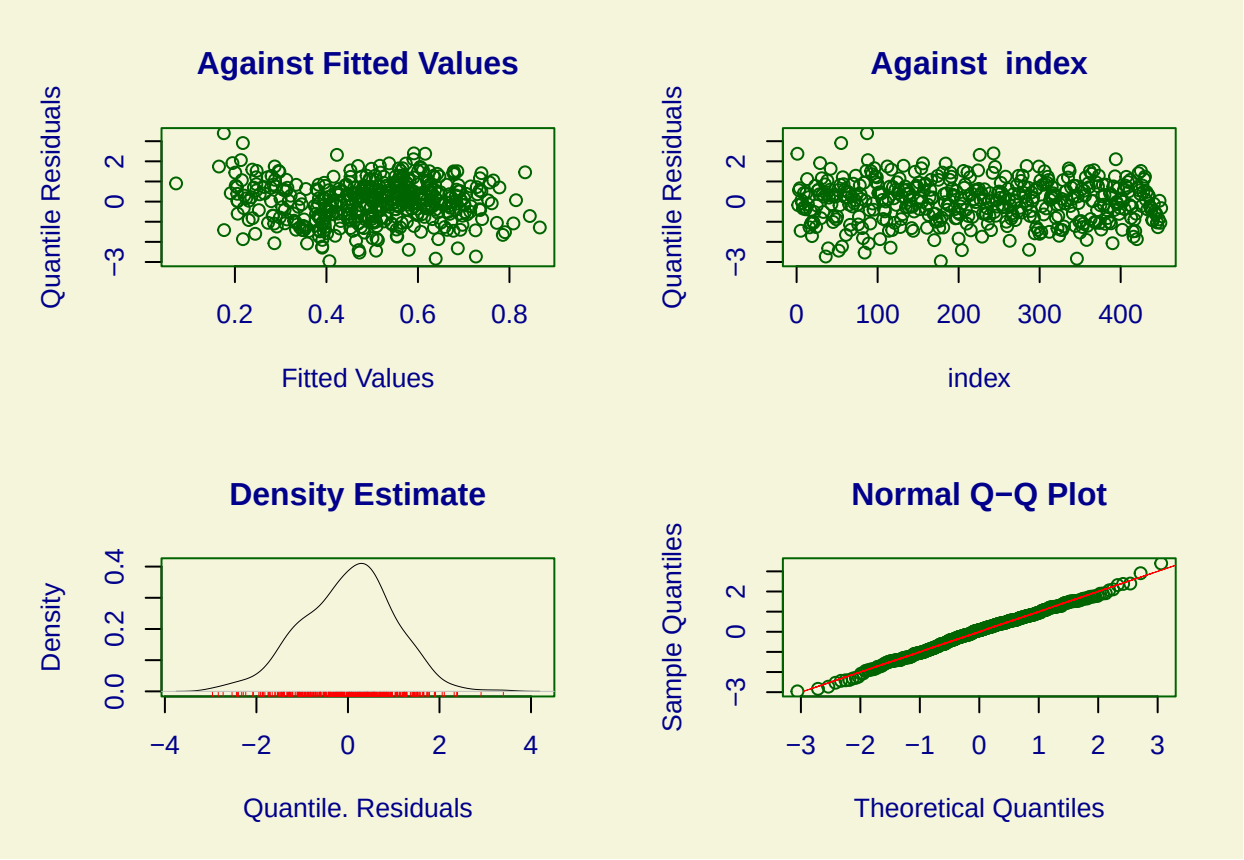
```
##
##  Durbin-Watson test
##
## data:  gamlss_normal_forw
## DW = 1.9266, p-value = 0.195
## alternative hypothesis: true autocorrelation is greater than 0
```

```r
#Independência
plot(gamlss_normal_forw$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```


```r
#Breusch_Pagan para homocedasticdade
bptest(gamlss_normal_forw) #p-value = 0.001575
```

```
##
##  studentized Breusch-Pagan test
##
## data:  gamlss_normal_forw
## BP = 17.457, df = 4, p-value = 0.001575
```

```r
##### Bacward Normal ####
plot(gamlss_normal_back)
```




```
## ****************************************************************
##        Summary of the Quantile Residuals
##                             mean   =  -6.621362e-16
##                         variance   =  1.002227
##                 coef. of skewness  =  -0.1456677
##                 coef. of kurtosis  =  3.071416
## Filliben correlation coefficient   =  0.9978431
## ****************************************************************
```

```
shapiro.test(gamlss_normal_back$residuals) #p-value = 0.2669, normal
```

```
##
##  Shapiro-Wilk normality test
##
## data:  gamlss_normal_back$residuals
## W = 0.99576, p-value = 0.2669
```

```
#Teste de durbin watson para independencia
library(lmtest)
dwtest(gamlss_normal_back) #p-value = 0.1735
```

```
##
##  Durbin-Watson test
##
## data:  gamlss_normal_back
## DW = 1.9193, p-value = 0.1735
## alternative hypothesis: true autocorrelation is greater than 0
```

```r
#Independência
plot(gamlss_normal_back$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```


```r
#Breusch_Pagan para homocedasticdade
bptest(gamlss_normal_back) #p-value = 0.0006407
```

```
##
##  studentized Breusch-Pagan test
##
## data:  gamlss_normal_back
## BP = 19.451, df = 4, p-value = 0.0006407
```