Beta Playoffs

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```
source("dados_playoffs.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
```

```
############### Regressão Beta ########

#Da para fazer a comparação entre loglog e probito pois são os maiores valores de
#Pseudo R-squared entre as funções de ligação.

## Fazer transformação (y* (n - 1) + 0.5)/n porque contém as extremidades
# Transformação que Smithson e Verkuiken (2006) indicaram no livro.

n = count(dados_regressaop) # n = 240
#Testanto a transformação
#WINP_transformado = (dados_regressaop$WIN_P*(240 - 1) + 0.5)/240

playoffs_transformado <- dados_regressaop %>%
  mutate(WINP_transformado = (dados_regressaop$WINP*(240 - 1) + 0.5)/240) %>%
  dplyr::select(-WINP)

playoffs_transformado
```

```
## # A tibble: 240 x 24
##    TEAM    PTS   FGM   FGA   FGP `3PM` `3PA` `3PP`   FTM   FTA   FTP  OREB  DREB
##    <fct> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>
##  1 Denv~  114.  42.3  86    49.2  11.3  30    37.5  17.7  22.1  80.1  10.1  34.7
##  2 Phil~  102.  36.7  84    43.7  12.2  33.9  35.9  16.9  19.1  88.6  10    33
##  3 Miam~  108.  39.7  86.8  45.8  12.8  33.7  38    16.1  19.8  81.3   9.2  31
##  4 Bost~  112   40.9  85.5  47.8  14.1  38.7  36.4  16.2  20    81     9.5  33.6
##  5 New ~  100.  35.3  81.5  43.3   9.5  32.7  29.2  20    26.8  74.6  12.9  32.5
```

```
##  6 Phoe~  114.  43.1  86.8  49.6   9.4  25.8  36.3  18.6  23.4  79.8   9.2  30.8
##  7 Los ~  112.  41.1  87.1  47.1  10.1  30.3  33.5  20.1  24.8  80.9   9.1  35.6
##  8 Gold~  113.  41.9  93.6  44.8  14.5  42.5  34    14.8  19.7  75    12.5  34.5
##  9 Sacr~  114.  41    95.6  42.9  12.1  39.7  30.6  19.6  25.7  76.1  14    33.7
## 10 Atla~  116.  44    96.3  45.7  14    37.3  37.5  13.8  17    81.4  12.2  31.7
## # i 230 more rows
## # i 11 more variables: REB <dbl>, AST <dbl>, TOV <dbl>, STL <dbl>, BLK <dbl>,
## #   BLKA <dbl>, PF <dbl>, PFD <dbl>, PlusMinus <dbl>, Numero_temporada <fct>,
## #   WINP_transformado <dbl>
```

```
summary(playoffs_transformado$WINP_transformado) # Agora o minímo não é mais 0.
```

```
##     Min.  1st Qu.   Median     Mean  3rd Qu.     Max.
## 0.002083 0.300584 0.429296 0.403525 0.544813 0.939163
```

```
##Leitura do pacote
library(betareg)

########## Regresão beta sem dados transformados. ######

#Está dando erro, porque diz que tem que estar entre (0, 1), e no banco de dados tem
#observações na WIN_P com 0 vitórias.
# modelo_betap_s1 <- betareg(WINP ~ . ,data = dados_regressaop) #Regressão com todos os dados do modelo
# modelo_betap_s1
# summary(modelo_betap_s1)
# coef(modelo_betap_s1)
# car::Anova(modelo_betap_s1)
# modelo_betap_s2 <- betareg(WIN_P ~ .,data = dados_regressaop, link = "loglog") #Regressão com todos o
# modelo_betap_s2
# summary(modelo_betap_s2)
# coef(modelo_betap_s2)

###Regressão beta com os dados transformados, segundo a transformação que citei anteriormente ########
#### Logito ########

##### modelo completo
modelo_betapt1 <- betareg(WINP_transformado ~ . ,data = playoffs_transformado) #Regressão com todos os
modelo_betapt1
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ ., data = playoffs_transformado)
##
## Coefficients (mean model with logit link):
##                (Intercept)          TEAMBoston Celtics
##                  -16.325190                   -0.147371
##          TEAMBrooklyn Nets       TEAMCharlotte Bobcats
##                   -0.934181                   -2.404465
##      TEAMCharlotte Hornets           TEAMChicago Bulls
##                    1.087084                   -0.182236
##    TEAMCleveland Cavaliers        TEAMDallas Mavericks
##                   -0.185620                   -0.477447
##         TEAMDenver Nuggets         TEAMDetroit Pistons
##                   -0.193453                   -2.196518
##  TEAMGolden State Warriors         TEAMHouston Rockets
```

```
##                -0.038318                  0.049807
##         TEAMIndiana Pacers             TEAMLA Clippers
##                -1.147663                 -0.571242
##   TEAMLos Angeles Clippers      TEAMLos Angeles Lakers
##                -0.081451                 -0.194850
##      TEAMMemphis Grizzlies              TEAMMiami Heat
##                 0.160823                 -0.233849
##        TEAMMilwaukee Bucks  TEAMMinnesota Timberwolves
##                -0.377493                 -0.138514
##    TEAMNew Orleans Hornets    TEAMNew Orleans Pelicans
##                 0.890152                 -0.879194
##        TEAMNew York Knicks   TEAMOklahoma City Thunder
##                -0.796348                 -0.090179
##          TEAMOrlando Magic     TEAMPhiladelphia 76ers
##                -0.480280                 -0.409600
##           TEAMPhoenix Suns  TEAMPortland Trail Blazers
##                -0.048300                 -0.281721
##       TEAMSacramento Kings       TEAMSan Antonio Spurs
##                -0.046683                 -0.398991
##        TEAMToronto Raptors               TEAMUtah Jazz
##                 0.088496                 -0.295102
##     TEAMWashington Wizards                      PTS
##                -0.017043                  1.843900
##                      FGM                      FGA
##                -3.900351                  0.074277
##                      FGP                     `3PM`
##                 0.179035                 -1.965068
##                    `3PA`                    `3PP`
##                 0.041658                  0.036071
##                      FTM                      FTA
##                -2.285711                  0.339323
##                      FTP                     OREB
##                 0.112855                 -2.018812
##                     DREB                      REB
##                -2.019840                  2.064153
##                      AST                      TOV
##                 0.012491                 -0.008793
##                      STL                      BLK
##                -0.030724                 -0.045358
##                     BLKA                       PF
##                -0.068158                 -0.023614
##                      PFD                PlusMinus
##                -0.015906                  0.131835
##          Numero_temporada2          Numero_temporada3
##                -0.027338                 -0.210501
##          Numero_temporada4          Numero_temporada5
##                -0.139984                 -0.050433
##          Numero_temporada6          Numero_temporada7
##                -0.013163                 -0.393290
##          Numero_temporada8          Numero_temporada9
##                -0.198060                 -0.313883
##         Numero_temporada10         Numero_temporada11
##                -0.186817                 -0.306833
##         Numero_temporada12         Numero_temporada13
```

```
##                  -0.233772                   -0.164900
##         Numero_temporada14          Numero_temporada15
##                  -0.179774                   -0.195035
##
## Phi coefficients (precision model with identity link):
## (phi)
## 14.28
```

```
coef(modelo_betapt1)
```

```
##                (Intercept)         TEAMBoston Celtics
##               -16.32518962                -0.14737080
##          TEAMBrooklyn Nets      TEAMCharlotte Bobcats
##                -0.93418108                -2.40446527
##      TEAMCharlotte Hornets          TEAMChicago Bulls
##                 1.08708389                -0.18223564
##    TEAMCleveland Cavaliers       TEAMDallas Mavericks
##                -0.18561979                -0.47744700
##         TEAMDenver Nuggets        TEAMDetroit Pistons
##                -0.19345264                -2.19651766
##  TEAMGolden State Warriors        TEAMHouston Rockets
##                -0.03831774                 0.04980740
##         TEAMIndiana Pacers            TEAMLA Clippers
##                -1.14766336                -0.57124240
##   TEAMLos Angeles Clippers     TEAMLos Angeles Lakers
##                -0.08145105                -0.19485011
##      TEAMMemphis Grizzlies             TEAMMiami Heat
##                 0.16082337                -0.23384942
##        TEAMMilwaukee Bucks TEAMMinnesota Timberwolves
##                -0.37749297                -0.13851447
##    TEAMNew Orleans Hornets   TEAMNew Orleans Pelicans
##                 0.89015193                -0.87919359
##        TEAMNew York Knicks  TEAMOklahoma City Thunder
##                -0.79634774                -0.09017932
##          TEAMOrlando Magic     TEAMPhiladelphia 76ers
##                -0.48028025                -0.40959957
##           TEAMPhoenix Suns TEAMPortland Trail Blazers
##                -0.04829970                -0.28172096
##       TEAMSacramento Kings      TEAMSan Antonio Spurs
##                -0.04668339                -0.39899121
##        TEAMToronto Raptors              TEAMUtah Jazz
##                 0.08849635                -0.29510244
##     TEAMWashington Wizards                         PTS
##                -0.01704321                 1.84390025
##                       FGM                         FGA
##                -3.90035120                 0.07427730
##                       FGP                        `3PM`
##                 0.17903506                -1.96506824
##                     `3PA`                        `3PP`
##                 0.04165759                 0.03607092
##                       FTM                         FTA
##                -2.28571094                 0.33932313
##                       FTP                        OREB
##                 0.11285542                -2.01881162
##                      DREB                         REB
```

```
##                -2.01983955                 2.06415273
##                        AST                        TOV
##                 0.01249066                -0.00879263
##                        STL                        BLK
##                -0.03072352                -0.04535849
##                       BLKA                         PF
##                -0.06815811                -0.02361374
##                        PFD                   PlusMinus
##                -0.01590624                 0.13183477
##          Numero_temporada2          Numero_temporada3
##                -0.02733829                -0.21050123
##          Numero_temporada4          Numero_temporada5
##                -0.13998382                -0.05043254
##          Numero_temporada6          Numero_temporada7
##                -0.01316342                -0.39328977
##          Numero_temporada8          Numero_temporada9
##                -0.19806007                -0.31388251
##         Numero_temporada10         Numero_temporada11
##                -0.18681674                -0.30683302
##         Numero_temporada12         Numero_temporada13
##                -0.23377209                -0.16489982
##         Numero_temporada14         Numero_temporada15
##                -0.17977415                -0.19503517
##                      (phi)
##                14.28410404
```

```
car::Anova(modelo_betapt1)
```

```
## Analysis of Deviance Table (Type II tests)
##
## Response: WINP_transformado
##                   Df   Chisq Pr(>Chisq)
## TEAM              32 82.8058  2.213e-06 ***
## PTS                1  6.8577   0.008826 **
## FGM                1  8.0361   0.004585 **
## FGA                1  0.2292   0.632131
## FGP                1  0.4208   0.516554
## `3PM`              1  7.6334   0.005730 **
## `3PA`              1  0.5733   0.448966
## `3PP`              1  0.8950   0.344115
## FTM                1  9.8726   0.001678 **
## FTA                1  4.6778   0.030555 *
## FTP                1  5.2484   0.021967 *
## OREB               1  4.3511   0.036986 *
## DREB               1  4.3251   0.037554 *
## REB                1  4.4924   0.034045 *
## AST                1  0.2278   0.633168
## TOV                1  0.0470   0.828339
## STL                1  0.3333   0.563715
## BLK                1  1.2926   0.255562
## BLKA               1  2.2240   0.135884
## PF                 1  0.7484   0.386969
## PFD                1  0.1180   0.731225
## PlusMinus          1 70.0848  < 2.2e-16 ***
## Numero_temporada 14  5.9810   0.966969
```

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

```
#### Modelo com as variáveis mais significantes com 5%
modelo_betapt11 <- betareg(WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTP + OREB + DREB + REB + Plusl
modelo_betapt11
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTP +
##     OREB + DREB + REB + PlusMinus, data = playoffs_transformado)
##
## Coefficients (mean model with logit link):
## (Intercept)          PTS          FGM        `3PM`          FTM          FTP
##    -2.56901      2.49719     -4.99637     -2.51458     -2.49227      0.01742
##        OREB         DREB          REB    PlusMinus
##    -2.91943     -2.88928      2.92531      0.14453
##
## Phi coefficients (precision model with identity link):
## (phi)
## 9.634
```

```
summary(modelo_betapt11) #Pseudo R-squared: 0.5699
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTP +
##     OREB + DREB + REB + PlusMinus, data = playoffs_transformado)
##
## Standardized weighted residuals 2:
##     Min      1Q  Median      3Q     Max
## -6.4676 -0.3094  0.1731  0.6298  1.8012
##
## Coefficients (mean model with logit link):
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept) -2.569005   1.058224  -2.428 0.015197 *
## PTS          2.497193   0.665680   3.751 0.000176 ***
## FGM         -4.996370   1.332488  -3.750 0.000177 ***
## `3PM`       -2.514576   0.664998  -3.781 0.000156 ***
## FTM         -2.492275   0.663855  -3.754 0.000174 ***
## FTP          0.017417   0.009775   1.782 0.074771 .
## OREB        -2.919431   0.967064  -3.019 0.002537 **
## DREB        -2.889279   0.968021  -2.985 0.002838 **
## REB          2.925307   0.968656   3.020 0.002528 **
## PlusMinus    0.144525   0.008249  17.521  < 2e-16 ***
##
## Phi coefficients (precision model with identity link):
##       Estimate Std. Error z value Pr(>|z|)
## (phi)   9.6341     0.8596   11.21   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Type of estimator: ML (maximum likelihood)
## Log-likelihood: 183.2 on 11 Df
## Pseudo R-squared: 0.5699
```

```
## Number of iterations: 22 (BFGS) + 3 (Fisher scoring)
```

```
coef(modelo_betapt11)
```

```
## (Intercept)         PTS         FGM       `3PM`         FTM         FTP
## -2.56900515  2.49719300 -4.99637027 -2.51457572 -2.49227475  0.01741689
##        OREB        DREB         REB   PlusMinus       (phi)
## -2.91943057 -2.88927949  2.92530722  0.14452525  9.63410141
```

```
car::Anova(modelo_betapt11)
```

```
## Analysis of Deviance Table (Type II tests)
##
## Response: WINP_transformado
##           Df    Chisq Pr(>Chisq)
## PTS        1  14.0726  0.0001759 ***
## FGM        1  14.0599  0.0001771 ***
## `3PM`      1  14.2984  0.0001560 ***
## FTM        1  14.0944  0.0001739 ***
## FTP        1   3.1750  0.0747713 .
## OREB       1   9.1135  0.0025373 **
## DREB       1   8.9086  0.0028383 **
## REB        1   9.1202  0.0025280 **
## PlusMinus  1 306.9739  < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
#### Modelo com as variáveis mais significantes com 5% e que foram significantes no anterior
modelo_betapt12 <- betareg(WINP_transformado ~ PTS + FGM + `3PM` + FTM + OREB + DREB + REB + PlusMinus,
modelo_betapt12
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + OREB +
##     DREB + REB + PlusMinus, data = playoffs_transformado)
##
## Coefficients (mean model with logit link):
## (Intercept)          PTS          FGM        `3PM`          FTM         OREB
##     -1.3804       2.6685      -5.3398      -2.6796      -2.6543      -2.7564
##        DREB          REB    PlusMinus
##     -2.7230       2.7586       0.1442
##
## Phi coefficients (precision model with identity link):
## (phi)
## 9.493
```

```
summary(modelo_betapt12) #Pseudo R-squared: 0.5663
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + OREB +
##     DREB + REB + PlusMinus, data = playoffs_transformado)
##
## Standardized weighted residuals 2:
##     Min      1Q  Median      3Q     Max
## -6.1250 -0.3009  0.1957  0.6649  1.7863
##
```

```
## Coefficients (mean model with logit link):
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept) -1.380400   0.794847  -1.737  0.08244 .
## PTS          2.668512   0.665425   4.010 6.07e-05 ***
## FGM         -5.339836   1.331940  -4.009 6.10e-05 ***
## `3PM`       -2.679553   0.665133  -4.029 5.61e-05 ***
## FTM         -2.654275   0.664082  -3.997 6.42e-05 ***
## OREB        -2.756365   0.972089  -2.836  0.00458 **
## DREB        -2.723026   0.972824  -2.799  0.00512 **
## REB          2.758599   0.973414   2.834  0.00460 **
## PlusMinus    0.144159   0.008291  17.387  < 2e-16 ***
##
## Phi coefficients (precision model with identity link):
##       Estimate Std. Error z value Pr(>|z|)
## (phi)   9.4930     0.8464   11.22   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Type of estimator: ML (maximum likelihood)
## Log-likelihood: 181.7 on 10 Df
## Pseudo R-squared: 0.5663
## Number of iterations: 21 (BFGS) + 2 (Fisher scoring)
```

```
coef(modelo_betapt12)
```

```
## (Intercept)         PTS         FGM       `3PM`         FTM        OREB
##  -1.3804003   2.6685124  -5.3398357  -2.6795526  -2.6542753  -2.7563649
##        DREB         REB   PlusMinus        (phi)
##  -2.7230260   2.7585990   0.1441593   9.4930244
```

```
##### Modelo com as variáveis mais significantes com 10%
modelo_betapt13 <- betareg(WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTA + FTP + OREB + DREB + REB +
modelo_betapt13
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTA +
##     FTP + OREB + DREB + REB + PlusMinus, data = playoffs_transformado)
##
## Coefficients (mean model with logit link):
## (Intercept)          PTS          FGM        `3PM`          FTM          FTA
##     -8.6232       2.5595      -5.1243      -2.5754      -2.8951       0.2600
##         FTP         OREB         DREB          REB    PlusMinus
##      0.0977      -2.7123      -2.6841       2.7201       0.1442
##
## Phi coefficients (precision model with identity link):
## (phi)
## 9.747
```

```
summary(modelo_betapt13) #Pseudo R-squared: 0.5755
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTA +
##     FTP + OREB + DREB + REB + PlusMinus, data = playoffs_transformado)
##
```

```
## Standardized weighted residuals 2:
##     Min      1Q  Median      3Q     Max
## -6.2900 -0.3101  0.1966  0.6392  1.8260
##
## Coefficients (mean model with logit link):
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept) -8.623214   3.878263  -2.223 0.026184 *
## PTS          2.559537   0.664883   3.850 0.000118 ***
## FGM         -5.124277   1.330987  -3.850 0.000118 ***
## `3PM`       -2.575363   0.664168  -3.878 0.000106 ***
## FTM         -2.895138   0.711302  -4.070  4.7e-05 ***
## FTA          0.260010   0.158831   1.637 0.101626
## FTP          0.097704   0.050759   1.925 0.054246 .
## OREB        -2.712308   0.969649  -2.797 0.005155 **
## DREB        -2.684126   0.970311  -2.766 0.005670 **
## REB          2.720117   0.971021   2.801 0.005090 **
## PlusMinus    0.144189   0.008212  17.559  < 2e-16 ***
##
## Phi coefficients (precision model with identity link):
##       Estimate Std. Error z value Pr(>|z|)
## (phi)   9.7473     0.8701    11.2   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Type of estimator: ML (maximum likelihood)
## Log-likelihood: 184.5 on 12 Df
## Pseudo R-squared: 0.5755
## Number of iterations: 25 (BFGS) + 4 (Fisher scoring)
```

```
coef(modelo_betapt13)
```

```
## (Intercept)         PTS         FGM       `3PM`         FTM         FTA
## -8.62321446  2.55953697 -5.12427700 -2.57536315 -2.89513800  0.26001021
##         FTP        OREB        DREB         REB   PlusMinus       (phi)
##  0.09770395 -2.71230810 -2.68412594  2.72011720  0.14418913  9.74731650
```

```
#####Fazendo a regressão beta, mas com loglog ####

#####Com todas as variáveis do modelo
modelo_betat_loglog <- betareg(WINP_transformado ~ .,data = playoffs_transformado, link = "loglog") #Re
modelo_betat_loglog
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ ., data = playoffs_transformado,
##     link = "loglog")
##
## Coefficients (mean model with loglog link):
##                 (Intercept)          TEAMBoston Celtics
##                   -1.342e+01                   -7.466e-02
##          TEAMBrooklyn Nets       TEAMCharlotte Bobcats
##                   -4.014e-01                   -7.917e-01
##      TEAMCharlotte Hornets           TEAMChicago Bulls
##                    6.821e-01                   -1.422e-01
##    TEAMCleveland Cavaliers        TEAMDallas Mavericks
```

```
##                 3.988e-02                 -3.021e-01
##         TEAMDenver Nuggets         TEAMDetroit Pistons
##                -1.133e-01                 -7.033e-01
##  TEAMGolden State Warriors         TEAMHouston Rockets
##                 9.793e-02                  2.181e-02
##         TEAMIndiana Pacers            TEAMLA Clippers
##                -7.269e-01                 -2.129e-01
##   TEAMLos Angeles Clippers      TEAMLos Angeles Lakers
##                -4.330e-02                 -2.464e-02
##      TEAMMemphis Grizzlies             TEAMMiami Heat
##                 1.283e-01                 -5.556e-02
##        TEAMMilwaukee Bucks  TEAMMinnesota Timberwolves
##                -1.694e-01                 -8.941e-02
##    TEAMNew Orleans Hornets    TEAMNew Orleans Pelicans
##                 6.967e-01                 -5.075e-01
##        TEAMNew York Knicks   TEAMOklahoma City Thunder
##                -4.919e-01                 -7.193e-02
##          TEAMOrlando Magic     TEAMPhiladelphia 76ers
##                -1.797e-01                 -2.146e-01
##           TEAMPhoenix Suns  TEAMPortland Trail Blazers
##                 1.838e-01                 -1.999e-01
##       TEAMSacramento Kings       TEAMSan Antonio Spurs
##                -1.019e-01                 -1.607e-01
##        TEAMToronto Raptors              TEAMUtah Jazz
##                 1.198e-01                 -2.327e-01
##     TEAMWashington Wizards                       PTS
##                 1.066e-01                  1.356e+00
##                       FGM                       FGA
##                -2.963e+00                  9.342e-02
##                       FGP                      `3PM`
##                 2.092e-01                 -1.373e+00
##                     `3PA`                      `3PP`
##                 1.009e-02                  8.780e-03
##                       FTM                       FTA
##                -1.583e+00                  1.642e-01
##                       FTP                      OREB
##                 5.879e-02                 -1.446e+00
##                      DREB                       REB
##                -1.447e+00                  1.488e+00
##                       AST                       TOV
##                 6.000e-03                 -1.245e-02
##                       STL                       BLK
##                 1.831e-02                 -2.358e-02
##                      BLKA                        PF
##                -2.423e-02                 -5.701e-03
##                       PFD                 PlusMinus
##                 3.976e-05                  7.148e-02
##          Numero_temporada2          Numero_temporada3
##                -3.550e-02                 -1.717e-01
##          Numero_temporada4          Numero_temporada5
##                -1.665e-01                 -6.682e-02
##          Numero_temporada6          Numero_temporada7
##                -5.465e-02                 -3.281e-01
##          Numero_temporada8          Numero_temporada9
```

```
##                 -1.503e-01                  -2.809e-01
##         Numero_temporada10          Numero_temporada11
##                 -2.305e-01                  -1.742e-01
##         Numero_temporada12          Numero_temporada13
##                 -1.689e-01                  -1.761e-01
##         Numero_temporada14          Numero_temporada15
##                 -2.550e-01                  -2.089e-01
##
## Phi coefficients (precision model with identity link):
## (phi)
## 16.14
```

```
summary(modelo_betat_loglog) #Pseudo R-squared: 0.7097
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ ., data = playoffs_transformado,
##     link = "loglog")
##
## Standardized weighted residuals 2:
##     Min      1Q  Median      3Q     Max
## -8.2142 -0.5625  0.0771  0.7591  2.5994
##
## Coefficients (mean model with loglog link):
##                              Estimate Std. Error z value Pr(>|z|)
## (Intercept)                -1.342e+01  6.556e+00  -2.047 0.040639 *
## TEAMBoston Celtics         -7.466e-02  1.383e-01  -0.540 0.589392
## TEAMBrooklyn Nets          -4.014e-01  1.519e-01  -2.643 0.008213 **
## TEAMCharlotte Bobcats      -7.917e-01  2.416e-01  -3.277 0.001050 **
## TEAMCharlotte Hornets       6.821e-01  3.900e-01   1.749 0.080298 .
## TEAMChicago Bulls          -1.422e-01  1.516e-01  -0.938 0.348473
## TEAMCleveland Cavaliers     3.988e-02  1.867e-01   0.214 0.830826
## TEAMDallas Mavericks       -3.021e-01  1.475e-01  -2.048 0.040580 *
## TEAMDenver Nuggets         -1.133e-01  1.580e-01  -0.717 0.473510
## TEAMDetroit Pistons        -7.033e-01  1.986e-01  -3.542 0.000398 ***
## TEAMGolden State Warriors   9.793e-02  1.857e-01   0.527 0.597974
## TEAMHouston Rockets         2.181e-02  1.736e-01   0.126 0.900024
## TEAMIndiana Pacers         -7.269e-01  1.477e-01  -4.921 8.61e-07 ***
## TEAMLA Clippers            -2.129e-01  1.807e-01  -1.178 0.238757
## TEAMLos Angeles Clippers   -4.330e-02  2.117e-01  -0.204 0.837987
## TEAMLos Angeles Lakers     -2.464e-02  1.668e-01  -0.148 0.882601
## TEAMMemphis Grizzlies       1.283e-01  1.517e-01   0.846 0.397722
## TEAMMiami Heat             -5.556e-02  1.508e-01  -0.369 0.712479
## TEAMMilwaukee Bucks        -1.694e-01  1.519e-01  -1.115 0.264898
## TEAMMinnesota Timberwolves -8.941e-02  2.203e-01  -0.406 0.684871
## TEAMNew Orleans Hornets     6.967e-01  2.681e-01   2.599 0.009361 **
## TEAMNew Orleans Pelicans   -5.075e-01  2.160e-01  -2.349 0.018813 *
## TEAMNew York Knicks        -4.919e-01  1.815e-01  -2.710 0.006722 **
## TEAMOklahoma City Thunder  -7.193e-02  1.591e-01  -0.452 0.651206
## TEAMOrlando Magic          -1.797e-01  1.731e-01  -1.038 0.299252
## TEAMPhiladelphia 76ers     -2.146e-01  1.568e-01  -1.369 0.171100
## TEAMPhoenix Suns            1.838e-01  2.309e-01   0.796 0.426029
## TEAMPortland Trail Blazers -1.999e-01  1.438e-01  -1.390 0.164593
## TEAMSacramento Kings       -1.019e-01  3.729e-01  -0.273 0.784594
## TEAMSan Antonio Spurs      -1.607e-01  1.505e-01  -1.068 0.285558
```

```
## TEAMToronto Raptors         1.198e-01  1.613e-01   0.743 0.457522
## TEAMUtah Jazz              -2.327e-01  1.579e-01  -1.474 0.140452
## TEAMWashington Wizards      1.066e-01  1.963e-01   0.543 0.586992
## PTS                         1.356e+00  4.211e-01   3.221 0.001278 **
## FGM                        -2.963e+00  8.293e-01  -3.573 0.000353 ***
## FGA                         9.342e-02  7.846e-02   1.191 0.233780
## FGP                         2.092e-01  1.412e-01   1.482 0.138408
## `3PM`                      -1.373e+00  4.187e-01  -3.280 0.001037 **
## `3PA`                       1.009e-02  2.789e-02   0.362 0.717599
## `3PP`                       8.780e-03  1.954e-02   0.449 0.653155
## FTM                        -1.583e+00  4.308e-01  -3.675 0.000238 ***
## FTA                         1.642e-01  8.441e-02   1.945 0.051725 .
## FTP                         5.879e-02  2.625e-02   2.240 0.025116 *
## OREB                       -1.446e+00  5.890e-01  -2.454 0.014109 *
## DREB                       -1.447e+00  5.913e-01  -2.447 0.014419 *
## REB                         1.488e+00  5.923e-01   2.513 0.011983 *
## AST                         6.000e-03  1.424e-02   0.421 0.673468
## TOV                        -1.245e-02  2.187e-02  -0.569 0.569163
## STL                         1.831e-02  2.726e-02   0.672 0.501805
## BLK                        -2.358e-02  2.165e-02  -1.089 0.276106
## BLKA                       -2.423e-02  2.303e-02  -1.052 0.292632
## PF                         -5.701e-03  1.496e-02  -0.381 0.703182
## PFD                         3.976e-05  2.351e-02   0.002 0.998651
## PlusMinus                   7.148e-02  8.111e-03   8.813  < 2e-16 ***
## Numero_temporada2          -3.550e-02  1.251e-01  -0.284 0.776538
## Numero_temporada3          -1.717e-01  1.247e-01  -1.376 0.168779
## Numero_temporada4          -1.665e-01  1.319e-01  -1.262 0.207075
## Numero_temporada5          -6.682e-02  1.307e-01  -0.511 0.609290
## Numero_temporada6          -5.465e-02  1.342e-01  -0.407 0.683891
## Numero_temporada7          -3.281e-01  1.420e-01  -2.310 0.020899 *
## Numero_temporada8          -1.503e-01  1.367e-01  -1.100 0.271393
## Numero_temporada9          -2.809e-01  1.504e-01  -1.868 0.061775 .
## Numero_temporada10         -2.305e-01  1.573e-01  -1.465 0.142866
## Numero_temporada11         -1.742e-01  1.662e-01  -1.048 0.294546
## Numero_temporada12         -1.689e-01  1.930e-01  -0.876 0.381284
## Numero_temporada13         -1.761e-01  1.909e-01  -0.923 0.356214
## Numero_temporada14         -2.550e-01  1.747e-01  -1.459 0.144578
## Numero_temporada15         -2.089e-01  1.910e-01  -1.094 0.274077
##
## Phi coefficients (precision model with identity link):
##       Estimate Std. Error z value Pr(>|z|)
## (phi)   16.139      1.467   11.01   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Type of estimator: ML (maximum likelihood)
## Log-likelihood: 241.2 on 69 Df
## Pseudo R-squared: 0.7818
## Number of iterations: 83 (BFGS) + 5 (Fisher scoring)
```

```
coef(modelo_betat_loglog)
```

```
##                (Intercept)         TEAMBoston Celtics
##              -1.342095e+01              -7.465857e-02
##          TEAMBrooklyn Nets      TEAMCharlotte Bobcats
```

```
##             -4.014261e-01             -7.917474e-01
##     TEAMCharlotte Hornets          TEAMChicago Bulls
##              6.820630e-01             -1.421602e-01
##    TEAMCleveland Cavaliers       TEAMDallas Mavericks
##              3.987876e-02             -3.021185e-01
##         TEAMDenver Nuggets        TEAMDetroit Pistons
##             -1.132803e-01             -7.033067e-01
##  TEAMGolden State Warriors        TEAMHouston Rockets
##              9.793071e-02              2.180757e-02
##         TEAMIndiana Pacers            TEAMLA Clippers
##             -7.268932e-01             -2.128618e-01
##   TEAMLos Angeles Clippers     TEAMLos Angeles Lakers
##             -4.329521e-02             -2.463814e-02
##      TEAMMemphis Grizzlies             TEAMMiami Heat
##              1.282647e-01             -5.555981e-02
##        TEAMMilwaukee Bucks TEAMMinnesota Timberwolves
##             -1.694013e-01             -8.941155e-02
##    TEAMNew Orleans Hornets   TEAMNew Orleans Pelicans
##              6.966654e-01             -5.075058e-01
##        TEAMNew York Knicks  TEAMOklahoma City Thunder
##             -4.918832e-01             -7.192864e-02
##          TEAMOrlando Magic     TEAMPhiladelphia 76ers
##             -1.797053e-01             -2.146432e-01
##           TEAMPhoenix Suns TEAMPortland Trail Blazers
##              1.837836e-01             -1.999207e-01
##       TEAMSacramento Kings      TEAMSan Antonio Spurs
##             -1.019159e-01             -1.607399e-01
##        TEAMToronto Raptors              TEAMUtah Jazz
##              1.198068e-01             -2.327067e-01
##     TEAMWashington Wizards                       PTS
##              1.066291e-01              1.356235e+00
##                       FGM                       FGA
##             -2.963079e+00              9.342465e-02
##                       FGP                      `3PM`
##              2.092083e-01             -1.373383e+00
##                     `3PA`                      `3PP`
##              1.008809e-02              8.779501e-03
##                       FTM                       FTA
##             -1.583141e+00              1.642076e-01
##                       FTP                      OREB
##              5.879192e-02             -1.445570e+00
##                      DREB                       REB
##             -1.446779e+00              1.488123e+00
##                       AST                       TOV
##              5.999799e-03             -1.244813e-02
##                       STL                       BLK
##              1.830860e-02             -2.358071e-02
##                      BLKA                        PF
##             -2.423408e-02             -5.701161e-03
##                       PFD                 PlusMinus
##              3.975573e-05              7.148054e-02
##          Numero_temporada2         Numero_temporada3
##             -3.549848e-02             -1.716647e-01
##          Numero_temporada4         Numero_temporada5
```

```
##              -1.664635e-01              -6.682369e-02
##          Numero_temporada6          Numero_temporada7
##              -5.465448e-02              -3.280673e-01
##          Numero_temporada8          Numero_temporada9
##              -1.503170e-01              -2.808919e-01
##         Numero_temporada10         Numero_temporada11
##              -2.305276e-01              -1.742193e-01
##         Numero_temporada12         Numero_temporada13
##              -1.689407e-01              -1.760896e-01
##         Numero_temporada14         Numero_temporada15
##              -2.549501e-01              -2.089086e-01
##                       (phi)
##               1.613906e+01
```

```
###### com variáveis significantes com alfa = 5%
modelo_betat_loglog1 <- betareg(WINP_transformado ~ PTS + FGM + `3PM` + FTM + OREB + DREB + REB + PlusM
modelo_betat_loglog1
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + OREB +
##     DREB + REB + PlusMinus, data = playoffs_transformado, link = "loglog")
##
## Coefficients (mean model with loglog link):
## (Intercept)          PTS          FGM        `3PM`          FTM         OREB
##    -0.61089      1.70104     -3.40418     -1.70574     -1.69784     -2.08042
##        DREB          REB    PlusMinus
##    -2.06192      2.08895      0.07889
##
## Phi coefficients (precision model with identity link):
## (phi)
## 9.889
```

```
summary(modelo_betat_loglog1) #Pseudo R-squared: 0.6993
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + OREB +
##     DREB + REB + PlusMinus, data = playoffs_transformado, link = "loglog")
##
## Standardized weighted residuals 2:
##     Min      1Q  Median      3Q     Max
## -6.6757 -0.2448  0.1920  0.6361  1.7945
##
## Coefficients (mean model with loglog link):
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept) -0.610893   0.449615  -1.359 0.174241
## PTS          1.701037   0.381098   4.464 8.06e-06 ***
## FGM         -3.404184   0.762770  -4.463 8.08e-06 ***
## `3PM`       -1.705742   0.381203  -4.475 7.65e-06 ***
## FTM         -1.697843   0.381080  -4.455 8.38e-06 ***
## OREB        -2.080420   0.578670  -3.595 0.000324 ***
## DREB        -2.061920   0.580499  -3.552 0.000382 ***
## REB          2.088946   0.580373   3.599 0.000319 ***
## PlusMinus    0.078889   0.003802  20.750  < 2e-16 ***
```

```
##
## Phi coefficients (precision model with identity link):
##       Estimate Std. Error z value Pr(>|z|)
## (phi)   9.8889     0.8855   11.17   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Type of estimator: ML (maximum likelihood)
## Log-likelihood: 182.1 on 10 Df
## Pseudo R-squared: 0.6993
## Number of iterations: 15 (BFGS) + 3 (Fisher scoring)
```

```
coef(modelo_betat_loglog1)
```

```
## (Intercept)         PTS         FGM       `3PM`         FTM        OREB
## -0.61089299  1.70103727 -3.40418352 -1.70574193 -1.69784257 -2.08042023
##        DREB         REB   PlusMinus       (phi)
## -2.06191987  2.08894600  0.07888932  9.88886009
```

```
##### Fazendo a regressão beta, mas com probito #######

#Modelo completo
modelo_betat_probit <- betareg(WINP_transformado ~ .,data = playoffs_transformado, link = "probit")
modelo_betat_probit
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ ., data = playoffs_transformado,
##     link = "probit")
##
## Coefficients (mean model with probit link):
##                (Intercept)          TEAMBoston Celtics
##                  -10.662599                  -0.086658
##          TEAMBrooklyn Nets       TEAMCharlotte Bobcats
##                   -0.523090                  -1.163753
##      TEAMCharlotte Hornets           TEAMChicago Bulls
##                    0.661968                  -0.119892
##    TEAMCleveland Cavaliers        TEAMDallas Mavericks
##                   -0.091981                  -0.287337
##         TEAMDenver Nuggets         TEAMDetroit Pistons
##                   -0.117525                  -1.028516
##  TEAMGolden State Warriors         TEAMHouston Rockets
##                   -0.011340                   0.035815
##         TEAMIndiana Pacers             TEAMLA Clippers
##                   -0.709766                  -0.297403
##   TEAMLos Angeles Clippers      TEAMLos Angeles Lakers
##                   -0.042717                  -0.096454
##      TEAMMemphis Grizzlies              TEAMMiami Heat
##                    0.101127                  -0.113469
##        TEAMMilwaukee Bucks  TEAMMinnesota Timberwolves
##                   -0.212419                  -0.095396
##    TEAMNew Orleans Hornets    TEAMNew Orleans Pelicans
##                    0.581474                  -0.542289
##        TEAMNew York Knicks   TEAMOklahoma City Thunder
##                   -0.492985                  -0.059127
```

```
##          TEAMOrlando Magic      TEAMPhiladelphia 76ers
##                  -0.251226                   -0.246610
##           TEAMPhoenix Suns  TEAMPortland Trail Blazers
##                   0.007733                   -0.184964
##       TEAMSacramento Kings       TEAMSan Antonio Spurs
##                  -0.047851                   -0.224810
##        TEAMToronto Raptors               TEAMUtah Jazz
##                   0.059834                   -0.190086
##     TEAMWashington Wizards                          PTS
##                   0.014843                    1.146786
##                        FGM                          FGA
##                  -2.449863                    0.055655
##                        FGP                         `3PM`
##                   0.130216                   -1.207974
##                       `3PA`                        `3PP`
##                   0.021624                    0.019587
##                        FTM                          FTA
##                  -1.395996                    0.188696
##                        FTP                         OREB
##                   0.064294                   -1.281249
##                       DREB                          REB
##                  -1.282804                    1.313036
##                        AST                          TOV
##                   0.007756                   -0.005995
##                        STL                          BLK
##                  -0.009544                   -0.026090
##                       BLKA                           PF
##                  -0.035819                   -0.011062
##                        PFD                    PlusMinus
##                  -0.007036                    0.076451
##          Numero_temporada2           Numero_temporada3
##                  -0.016874                   -0.131976
##          Numero_temporada4           Numero_temporada5
##                  -0.099483                   -0.036310
##          Numero_temporada6           Numero_temporada7
##                  -0.017154                   -0.250792
##          Numero_temporada8           Numero_temporada9
##                  -0.121930                   -0.205626
##         Numero_temporada10          Numero_temporada11
##                  -0.130307                   -0.163261
##         Numero_temporada12          Numero_temporada13
##                  -0.136980                   -0.106495
##         Numero_temporada14          Numero_temporada15
##                  -0.130224                   -0.123475
##
## Phi coefficients (precision model with identity link):
## (phi)
## 14.86
```

```
coef(modelo_betat_probit)
```

```
##                (Intercept)         TEAMBoston Celtics
##              -10.662598670               -0.086658440
##          TEAMBrooklyn Nets      TEAMCharlotte Bobcats
##               -0.523089754               -1.163752859
```

```
##      TEAMCharlotte Hornets          TEAMChicago Bulls
##                0.661968060               -0.119891661
##    TEAMCleveland Cavaliers       TEAMDallas Mavericks
##               -0.091981144               -0.287336534
##         TEAMDenver Nuggets        TEAMDetroit Pistons
##               -0.117525183               -1.028516274
##  TEAMGolden State Warriors        TEAMHouston Rockets
##               -0.011339764                0.035814683
##         TEAMIndiana Pacers            TEAMLA Clippers
##               -0.709765993               -0.297402692
##   TEAMLos Angeles Clippers     TEAMLos Angeles Lakers
##               -0.042717228               -0.096454406
##      TEAMMemphis Grizzlies             TEAMMiami Heat
##                0.101127415               -0.113468830
##        TEAMMilwaukee Bucks TEAMMinnesota Timberwolves
##               -0.212418816               -0.095396323
##    TEAMNew Orleans Hornets   TEAMNew Orleans Pelicans
##                0.581473544               -0.542288841
##        TEAMNew York Knicks  TEAMOklahoma City Thunder
##               -0.492985279               -0.059126593
##          TEAMOrlando Magic     TEAMPhiladelphia 76ers
##               -0.251225639               -0.246610283
##           TEAMPhoenix Suns TEAMPortland Trail Blazers
##                0.007733444               -0.184963584
##       TEAMSacramento Kings      TEAMSan Antonio Spurs
##               -0.047850680               -0.224809545
##        TEAMToronto Raptors              TEAMUtah Jazz
##                0.059834418               -0.190085564
##     TEAMWashington Wizards                        PTS
##                0.014843095                1.146786374
##                        FGM                        FGA
##               -2.449863130                0.055654627
##                        FGP                       `3PM`
##                0.130215629               -1.207974113
##                      `3PA`                      `3PP`
##                0.021623771                0.019586634
##                        FTM                        FTA
##               -1.395995571                0.188695839
##                        FTP                       OREB
##                0.064294043               -1.281248621
##                       DREB                        REB
##               -1.282803591                1.313035671
##                        AST                        TOV
##                0.007756132               -0.005994823
##                        STL                        BLK
##               -0.009543926               -0.026090236
##                       BLKA                         PF
##               -0.035819278               -0.011061786
##                        PFD                   PlusMinus
##               -0.007035571                0.076450777
##          Numero_temporada2          Numero_temporada3
##               -0.016874143               -0.131975761
##          Numero_temporada4          Numero_temporada5
##               -0.099482892               -0.036310070
```

```
##          Numero_temporada6          Numero_temporada7
##               -0.017153834               -0.250792146
##          Numero_temporada8          Numero_temporada9
##               -0.121930456               -0.205626140
##         Numero_temporada10         Numero_temporada11
##               -0.130306805               -0.163261454
##         Numero_temporada12         Numero_temporada13
##               -0.136979908               -0.106495067
##         Numero_temporada14         Numero_temporada15
##               -0.130224390               -0.123474528
##                      (phi)
##               14.864499007
```

```
#Modelo com 5%
modelo_betat_probit1 <- betareg(WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTP + OREB + DREB + REB +
modelo_betat_probit1
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTP +
##     OREB + DREB + REB + PlusMinus, data = playoffs_transformado, link = "probit")
##
## Coefficients (mean model with probit link):
## (Intercept)          PTS          FGM        `3PM`          FTM          FTP
##   -1.498009     1.525395    -3.052708    -1.534551    -1.522960     0.009347
##        OREB         DREB          REB    PlusMinus
##   -1.858890    -1.841910     1.864733     0.084387
##
## Phi coefficients (precision model with identity link):
## (phi)
## 9.824
```

```
summary(modelo_betat_probit1) #Pseudo R-squared: 0.6337
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTP +
##     OREB + DREB + REB + PlusMinus, data = playoffs_transformado, link = "probit")
##
## Standardized weighted residuals 2:
##     Min      1Q  Median      3Q     Max
## -6.6515 -0.2989  0.1784  0.6317  1.8039
##
## Coefficients (mean model with probit link):
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept) -1.498009   0.617607  -2.426  0.01529 *
## PTS          1.525395   0.391590   3.895 9.80e-05 ***
## FGM         -3.052708   0.783829  -3.895 9.84e-05 ***
## `3PM`       -1.534551   0.391269  -3.922 8.78e-05 ***
## FTM         -1.522960   0.390650  -3.899 9.68e-05 ***
## FTP          0.009347   0.005706   1.638  0.10139
## OREB        -1.858890   0.578623  -3.213  0.00132 **
## DREB        -1.841910   0.579370  -3.179  0.00148 **
## REB          1.864733   0.579662   3.217  0.00130 **
## PlusMinus    0.084387   0.004463  18.907  < 2e-16 ***
```

```
##
## Phi coefficients (precision model with identity link):
##       Estimate Std. Error z value Pr(>|z|)
## (phi)   9.8243     0.8797   11.17   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Type of estimator: ML (maximum likelihood)
## Log-likelihood: 184.1 on 11 Df
## Pseudo R-squared: 0.6337
## Number of iterations: 18 (BFGS) + 2 (Fisher scoring)
```

```
coef(modelo_betat_probit1)
```

```
##  (Intercept)          PTS          FGM        `3PM`          FTM          FTP
## -1.498008670  1.525394731 -3.052708211 -1.534550659 -1.522960142  0.009346643
##         OREB         DREB          REB    PlusMinus        (phi)
## -1.858889563 -1.841909893  1.864732741  0.084386765  9.824319979
```

```
#Modelo com 12%
modelo_betat_probit2 <- betareg(WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTA + FTP + OREB + DREB +
modelo_betat_probit2
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTA +
##     FTP + OREB + DREB + REB + PlusMinus, data = playoffs_transformado,
##     link = "probit")
##
## Coefficients (mean model with probit link):
## (Intercept)          PTS          FGM        `3PM`          FTM          FTA
##    -4.66848      1.55940     -3.12236     -1.56768     -1.73660      0.13721
##         FTP         OREB         DREB          REB    PlusMinus
##     0.05141     -1.74539     -1.72933      1.75204      0.08412
##
## Phi coefficients (precision model with identity link):
## (phi)
## 9.928
```

```
summary(modelo_betat_probit2) #Pseudo R-squared: 0.638
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTA +
##     FTP + OREB + DREB + REB + PlusMinus, data = playoffs_transformado,
##     link = "probit")
##
## Standardized weighted residuals 2:
##     Min      1Q  Median      3Q     Max
## -6.4887 -0.3025  0.1774  0.6423  1.8262
##
## Coefficients (mean model with probit link):
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept) -4.668482   2.221269  -2.102  0.03558 *
## PTS          1.559404   0.390851   3.990 6.61e-05 ***
## FGM         -3.122359   0.782404  -3.991 6.59e-05 ***
```

```
## `3PM`       -1.567676   0.390513  -4.014 5.96e-05 ***
## FTM         -1.736604   0.416183  -4.173 3.01e-05 ***
## FTA          0.137206   0.091797   1.495  0.13500
## FTP          0.051412   0.029100   1.767  0.07727 .
## OREB        -1.745389   0.580823  -3.005  0.00266 **
## DREB        -1.729332   0.581407  -2.974  0.00294 **
## REB          1.752038   0.581761   3.012  0.00260 **
## PlusMinus    0.084125   0.004447  18.917  < 2e-16 ***
##
## Phi coefficients (precision model with identity link):
##       Estimate Std. Error z value Pr(>|z|)
## (phi)   9.9280     0.8893   11.16   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Type of estimator: ML (maximum likelihood)
## Log-likelihood: 185.1 on 12 Df
## Pseudo R-squared: 0.638
## Number of iterations: 20 (BFGS) + 3 (Fisher scoring)
```

```r
coef(modelo_betat_probit2)
```

```
## (Intercept)         PTS         FGM       `3PM`         FTM         FTA
## -4.66848188  1.55940399 -3.12235859 -1.56767585 -1.73660423  0.13720579
##         FTP        OREB        DREB         REB   PlusMinus       (phi)
##  0.05141195 -1.74538936 -1.72933195  1.75203753  0.08412461  9.92802961
```

```r
#####Fazendo a regressão beta, mas com cloglog #######

#Modelo completo
modelo_betat_cloglog <- betareg(WINP_transformado ~ ., data = playoffs_transformado, link = "cloglog")
modelo_betat_cloglog
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ ., data = playoffs_transformado,
##     link = "cloglog")
##
## Coefficients (mean model with cloglog link):
##                (Intercept)          TEAMBoston Celtics
##                  -12.343521                   -0.148632
##          TEAMBrooklyn Nets       TEAMCharlotte Bobcats
##                   -0.825668                   -2.347560
##      TEAMCharlotte Hornets           TEAMChicago Bulls
##                    0.832027                   -0.156684
##    TEAMCleveland Cavaliers        TEAMDallas Mavericks
##                   -0.299117                   -0.370233
##         TEAMDenver Nuggets         TEAMDetroit Pistons
##                   -0.202224                   -2.088603
##  TEAMGolden State Warriors         TEAMHouston Rockets
##                   -0.139022                    0.047597
##         TEAMIndiana Pacers             TEAMLA Clippers
##                   -0.912518                   -0.466035
##   TEAMLos Angeles Clippers      TEAMLos Angeles Lakers
##                   -0.063292                   -0.225173
```

```
##      TEAMMemphis Grizzlies              TEAMMiami Heat
##                   0.102694                   -0.237603
##        TEAMMilwaukee Bucks  TEAMMinnesota Timberwolves
##                  -0.331142                   -0.161577
##    TEAMNew Orleans Hornets    TEAMNew Orleans Pelicans
##                   0.593752                   -0.741967
##        TEAMNew York Knicks   TEAMOklahoma City Thunder
##                  -0.669366                   -0.100785
##          TEAMOrlando Magic      TEAMPhiladelphia 76ers
##                  -0.493267                   -0.373430
##           TEAMPhoenix Suns  TEAMPortland Trail Blazers
##                  -0.174180                   -0.270599
##       TEAMSacramento Kings       TEAMSan Antonio Spurs
##                  -0.033814                   -0.403249
##        TEAMToronto Raptors               TEAMUtah Jazz
##                  -0.002904                   -0.247055
##     TEAMWashington Wizards                          PTS
##                  -0.048618                    1.252113
##                        FGM                          FGA
##                  -2.657001                    0.052831
##                        FGP                         `3PM`
##                   0.126592                   -1.351409
##                       `3PA`                        `3PP`
##                   0.032630                    0.031214
##                        FTM                          FTA
##                  -1.595749                    0.263474
##                        FTP                         OREB
##                   0.087354                   -1.508288
##                       DREB                          REB
##                  -1.513310                    1.542553
##                        AST                          TOV
##                   0.006724                   -0.005986
##                        STL                          BLK
##                  -0.045544                   -0.034457
##                       BLKA                           PF
##                  -0.053021                   -0.013860
##                        PFD                    PlusMinus
##                  -0.013089                    0.102547
##         Numero_temporada2           Numero_temporada3
##                   0.015925                   -0.094511
##         Numero_temporada4           Numero_temporada5
##                  -0.060602                   -0.017679
##         Numero_temporada6           Numero_temporada7
##                   0.000470                   -0.234363
##         Numero_temporada8           Numero_temporada9
##                  -0.136399                   -0.192557
##        Numero_temporada10          Numero_temporada11
##                  -0.066891                   -0.174354
##        Numero_temporada12          Numero_temporada13
##                  -0.110648                   -0.089623
##        Numero_temporada14          Numero_temporada15
##                  -0.034687                   -0.041505
##
## Phi coefficients (precision model with identity link):
```

```
## (phi)
##  12.6
```

```
coef(modelo_betat_cloglog)
```

```
##                (Intercept)         TEAMBoston Celtics
##              -1.234352e+01              -1.486322e-01
##          TEAMBrooklyn Nets      TEAMCharlotte Bobcats
##              -8.256684e-01              -2.347560e+00
##      TEAMCharlotte Hornets          TEAMChicago Bulls
##               8.320269e-01              -1.566842e-01
##    TEAMCleveland Cavaliers       TEAMDallas Mavericks
##              -2.991169e-01              -3.702328e-01
##         TEAMDenver Nuggets        TEAMDetroit Pistons
##              -2.022243e-01              -2.088603e+00
##  TEAMGolden State Warriors        TEAMHouston Rockets
##              -1.390223e-01               4.759744e-02
##         TEAMIndiana Pacers            TEAMLA Clippers
##              -9.125180e-01              -4.660354e-01
##   TEAMLos Angeles Clippers     TEAMLos Angeles Lakers
##              -6.329173e-02              -2.251732e-01
##      TEAMMemphis Grizzlies             TEAMMiami Heat
##               1.026943e-01              -2.376033e-01
##        TEAMMilwaukee Bucks TEAMMinnesota Timberwolves
##              -3.311421e-01              -1.615774e-01
##    TEAMNew Orleans Hornets   TEAMNew Orleans Pelicans
##               5.937522e-01              -7.419669e-01
##        TEAMNew York Knicks  TEAMOklahoma City Thunder
##              -6.693660e-01              -1.007853e-01
##          TEAMOrlando Magic     TEAMPhiladelphia 76ers
##              -4.932668e-01              -3.734301e-01
##           TEAMPhoenix Suns TEAMPortland Trail Blazers
##              -1.741801e-01              -2.705987e-01
##       TEAMSacramento Kings      TEAMSan Antonio Spurs
##              -3.381425e-02              -4.032494e-01
##        TEAMToronto Raptors              TEAMUtah Jazz
##              -2.904440e-03              -2.470548e-01
##     TEAMWashington Wizards                        PTS
##              -4.861826e-02               1.252113e+00
##                         FGM                        FGA
##              -2.657001e+00               5.283052e-02
##                         FGP                       `3PM`
##               1.265919e-01              -1.351409e+00
##                       `3PA`                       `3PP`
##               3.262956e-02               3.121359e-02
##                         FTM                        FTA
##              -1.595749e+00               2.634738e-01
##                         FTP                      OREB
##               8.735410e-02              -1.508288e+00
##                        DREB                       REB
##              -1.513310e+00               1.542553e+00
##                         AST                        TOV
##               6.723521e-03              -5.985832e-03
##                         STL                        BLK
##              -4.554443e-02              -3.445678e-02
```

```
##                        BLKA                          PF
##               -5.302061e-02               -1.385989e-02
##                         PFD                   PlusMinus
##               -1.308896e-02                1.025467e-01
##          Numero_temporada2          Numero_temporada3
##                1.592477e-02               -9.451089e-02
##          Numero_temporada4          Numero_temporada5
##               -6.060165e-02               -1.767928e-02
##          Numero_temporada6          Numero_temporada7
##                4.700152e-04               -2.343628e-01
##          Numero_temporada8          Numero_temporada9
##               -1.363990e-01               -1.925572e-01
##         Numero_temporada10         Numero_temporada11
##               -6.689122e-02               -1.743541e-01
##         Numero_temporada12         Numero_temporada13
##               -1.106478e-01               -8.962269e-02
##         Numero_temporada14         Numero_temporada15
##               -3.468745e-02               -4.150533e-02
##                       (phi)
##                1.260376e+01
```

```
#Modelo com 5%
modelo_betat_cloglog1 <- betareg(WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTP + OREB + DREB + REB +
modelo_betat_cloglog1
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTP +
##     OREB + DREB + REB + PlusMinus, data = playoffs_transformado, link = "cloglog")
##
## Coefficients (mean model with cloglog link):
## (Intercept)          PTS          FGM        `3PM`          FTM          FTP
##    -2.32075      1.73934     -3.48600     -1.75121     -1.73532      0.01524
##        OREB         DREB          REB    PlusMinus
##    -1.99649     -1.98159      2.00668      0.10966
##
## Phi coefficients (precision model with identity link):
## (phi)
## 8.759
```

```
summary(modelo_betat_cloglog1) #Pseudo R-squared: 0.5199
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTP +
##     OREB + DREB + REB + PlusMinus, data = playoffs_transformado, link = "cloglog")
##
## Standardized weighted residuals 2:
##     Min      1Q  Median      3Q     Max
## -6.1809 -0.2686  0.2275  0.6750  1.6633
##
## Coefficients (mean model with cloglog link):
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept) -2.320753   0.831128  -2.792 0.005234 **
## PTS          1.739340   0.512007   3.397 0.000681 ***
```

```
## FGM         -3.486001   1.025013  -3.401 0.000672 ***
## `3PM`       -1.751211   0.511519  -3.424 0.000618 ***
## FTM         -1.735316   0.510747  -3.398 0.000680 ***
## FTP          0.015240   0.007712   1.976 0.048138 *
## OREB        -1.996493   0.745473  -2.678 0.007403 **
## DREB        -1.981592   0.745722  -2.657 0.007877 **
## REB          2.006676   0.746449   2.688 0.007182 **
## PlusMinus    0.109664   0.006450  17.002  < 2e-16 ***
##
## Phi coefficients (precision model with identity link):
##       Estimate Std. Error z value Pr(>|z|)
## (phi)   8.7594     0.7771   11.27   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Type of estimator: ML (maximum likelihood)
## Log-likelihood: 173.6 on 11 Df
## Pseudo R-squared: 0.5199
## Number of iterations: 22 (BFGS) + 3 (Fisher scoring)
```

```
coef(modelo_betat_cloglog1)
```

```
## (Intercept)         PTS         FGM       `3PM`         FTM         FTP
## -2.32075271  1.73934024 -3.48600111 -1.75121052 -1.73531593  0.01524002
##        OREB        DREB         REB   PlusMinus       (phi)
## -1.99649256 -1.98159150  2.00667586  0.10966443  8.75936008
```

```
#Modelo com 10%
modelo_betat_cloglog2 <- betareg(WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTA + FTP + OREB + DREB +
modelo_betat_cloglog2
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTA +
##     FTP + OREB + DREB + REB + PlusMinus, data = playoffs_transformado,
##     link = "cloglog")
##
## Coefficients (mean model with cloglog link):
## (Intercept)          PTS          FGM        `3PM`          FTM          FTA
##    -7.17404      1.80636     -3.62238     -1.81706     -2.07370      0.20721
##         FTP         OREB         DREB          REB    PlusMinus
##     0.07949     -1.83846     -1.82639      1.85116      0.10922
##
## Phi coefficients (precision model with identity link):
## (phi)
## 8.845
```

```
summary(modelo_betat_cloglog2) #Pseudo R-squared: 0.5268
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTA +
##     FTP + OREB + DREB + REB + PlusMinus, data = playoffs_transformado,
##     link = "cloglog")
##
## Standardized weighted residuals 2:
```

```
##     Min      1Q  Median      3Q     Max
## -6.0287 -0.2642  0.2365  0.6660  1.6869
##
## Coefficients (mean model with cloglog link):
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept) -7.174038   3.157786  -2.272 0.023095 *
## PTS          1.806357   0.513848   3.515 0.000439 ***
## FGM         -3.622383   1.028739  -3.521 0.000430 ***
## `3PM`       -1.817062   0.513364  -3.540 0.000401 ***
## FTM         -2.073704   0.558083  -3.716 0.000203 ***
## FTA          0.207213   0.128557   1.612 0.106996
## FTP          0.079490   0.041237   1.928 0.053901 .
## OREB        -1.838459   0.749150  -2.454 0.014125 *
## DREB        -1.826389   0.749128  -2.438 0.014768 *
## REB          1.851159   0.749894   2.469 0.013566 *
## PlusMinus    0.109223   0.006425  16.999  < 2e-16 ***
##
## Phi coefficients (precision model with identity link):
##       Estimate Std. Error z value Pr(>|z|)
## (phi)   8.8445     0.7849   11.27   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Type of estimator: ML (maximum likelihood)
## Log-likelihood: 174.9 on 12 Df
## Pseudo R-squared: 0.5268
## Number of iterations: 25 (BFGS) + 4 (Fisher scoring)
```

```r
coef(modelo_betat_cloglog2)
```

```
## (Intercept)         PTS         FGM       `3PM`         FTM         FTA
## -7.17403825  1.80635742 -3.62238316 -1.81706211 -2.07370361  0.20721314
##         FTP        OREB        DREB         REB   PlusMinus       (phi)
##  0.07949004 -1.83845870 -1.82638860  1.85115864  0.10922301  8.84452558
```

```r
#####Fazendo a regressão beta, mas com cauchito ######

#Modelo completo
modelo_betat_cauchit <- betareg(WINP_transformado ~ ., data = playoffs_transformado, link = "cauchit")
modelo_betat_cauchit
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ ., data = playoffs_transformado,
##     link = "cauchit")
##
## Coefficients (mean model with cauchit link):
##                (Intercept)          TEAMBoston Celtics
##                  -17.931687                   -0.182517
##          TEAMBrooklyn Nets       TEAMCharlotte Bobcats
##                   -1.021994                  -11.179160
##      TEAMCharlotte Hornets           TEAMChicago Bulls
##                    1.002774                   -0.154626
##    TEAMCleveland Cavaliers        TEAMDallas Mavericks
##                   -0.151301                   -0.456241
```

```
##         TEAMDenver Nuggets         TEAMDetroit Pistons
##                  -0.182403                  -10.677864
##  TEAMGolden State Warriors         TEAMHouston Rockets
##                  -0.008257                   -0.041857
##         TEAMIndiana Pacers             TEAMLA Clippers
##                  -0.934964                   -0.821003
##   TEAMLos Angeles Clippers      TEAMLos Angeles Lakers
##                  -0.172159                   -0.310183
##      TEAMMemphis Grizzlies              TEAMMiami Heat
##                   0.090486                   -0.413996
##        TEAMMilwaukee Bucks  TEAMMinnesota Timberwolves
##                  -0.398602                   -0.064306
##    TEAMNew Orleans Hornets    TEAMNew Orleans Pelicans
##                   0.616405                   -0.629833
##        TEAMNew York Knicks   TEAMOklahoma City Thunder
##                  -0.633976                   -0.094495
##          TEAMOrlando Magic     TEAMPhiladelphia 76ers
##                  -0.794379                   -0.386140
##           TEAMPhoenix Suns  TEAMPortland Trail Blazers
##                  -0.098695                   -0.217182
##       TEAMSacramento Kings       TEAMSan Antonio Spurs
##                   0.045260                   -0.434781
##        TEAMToronto Raptors               TEAMUtah Jazz
##                   0.036052                   -0.274575
##     TEAMWashington Wizards                          PTS
##                  -0.142167                    1.696946
##                        FGM                          FGA
##                  -3.631740                    0.097137
##                        FGP                         `3PM`
##                   0.205168                   -1.786075
##                      `3PA`                         `3PP`
##                   0.026618                    0.022352
##                        FTM                          FTA
##                  -2.225292                    0.410319
##                        FTP                         OREB
##                   0.132389                   -1.726693
##                       DREB                          REB
##                  -1.710673                    1.741969
##                        AST                          TOV
##                   0.000802                   -0.015104
##                        STL                          BLK
##                  -0.059032                   -0.042946
##                       BLKA                           PF
##                  -0.071196                   -0.038234
##                        PFD                    PlusMinus
##                  -0.012453                    0.141625
##          Numero_temporada2          Numero_temporada3
##                  -0.084809                   -0.178465
##          Numero_temporada4          Numero_temporada5
##                  -0.146221                   -0.064536
##          Numero_temporada6          Numero_temporada7
##                  -0.013495                   -0.380426
##          Numero_temporada8          Numero_temporada9
##                  -0.313855                   -0.197435
```

```
##         Numero_temporada10          Numero_temporada11
##                  -0.156363                   -0.420979
##         Numero_temporada12          Numero_temporada13
##                  -0.242676                   -0.202929
##         Numero_temporada14          Numero_temporada15
##                  -0.150330                   -0.172826
##
## Phi coefficients (precision model with identity link):
## (phi)
## 10.88
```

```
coef(modelo_betat_cauchit)
```

```
##                (Intercept)         TEAMBoston Celtics
##              -1.793169e+01              -1.825172e-01
##          TEAMBrooklyn Nets      TEAMCharlotte Bobcats
##              -1.021994e+00              -1.117916e+01
##      TEAMCharlotte Hornets          TEAMChicago Bulls
##               1.002774e+00              -1.546264e-01
##    TEAMCleveland Cavaliers       TEAMDallas Mavericks
##              -1.513008e-01              -4.562410e-01
##         TEAMDenver Nuggets        TEAMDetroit Pistons
##              -1.824029e-01              -1.067786e+01
##  TEAMGolden State Warriors        TEAMHouston Rockets
##              -8.257245e-03              -4.185746e-02
##         TEAMIndiana Pacers            TEAMLA Clippers
##              -9.349639e-01              -8.210027e-01
##   TEAMLos Angeles Clippers     TEAMLos Angeles Lakers
##              -1.721585e-01              -3.101830e-01
##      TEAMMemphis Grizzlies             TEAMMiami Heat
##               9.048593e-02              -4.139957e-01
##        TEAMMilwaukee Bucks TEAMMinnesota Timberwolves
##              -3.986017e-01              -6.430584e-02
##    TEAMNew Orleans Hornets   TEAMNew Orleans Pelicans
##               6.164050e-01              -6.298328e-01
##        TEAMNew York Knicks  TEAMOklahoma City Thunder
##              -6.339764e-01              -9.449525e-02
##          TEAMOrlando Magic     TEAMPhiladelphia 76ers
##              -7.943795e-01              -3.861399e-01
##           TEAMPhoenix Suns TEAMPortland Trail Blazers
##              -9.869461e-02              -2.171822e-01
##       TEAMSacramento Kings      TEAMSan Antonio Spurs
##               4.525980e-02              -4.347812e-01
##        TEAMToronto Raptors              TEAMUtah Jazz
##               3.605167e-02              -2.745745e-01
##     TEAMWashington Wizards                        PTS
##              -1.421672e-01               1.696946e+00
##                        FGM                        FGA
##              -3.631740e+00               9.713705e-02
##                        FGP                      `3PM`
##               2.051681e-01              -1.786075e+00
##                      `3PA`                      `3PP`
##               2.661786e-02               2.235162e-02
##                        FTM                        FTA
##              -2.225292e+00               4.103193e-01
```

```
##                         FTP                        OREB
##               1.323893e-01               -1.726693e+00
##                        DREB                         REB
##              -1.710673e+00                1.741969e+00
##                         AST                         TOV
##               8.020238e-04               -1.510425e-02
##                         STL                         BLK
##              -5.903238e-02               -4.294561e-02
##                        BLKA                          PF
##              -7.119626e-02               -3.823351e-02
##                         PFD                    PlusMinus
##              -1.245332e-02                1.416246e-01
##          Numero_temporada2           Numero_temporada3
##              -8.480858e-02               -1.784650e-01
##          Numero_temporada4           Numero_temporada5
##              -1.462210e-01               -6.453629e-02
##          Numero_temporada6           Numero_temporada7
##              -1.349475e-02               -3.804258e-01
##          Numero_temporada8           Numero_temporada9
##              -3.138549e-01               -1.974347e-01
##         Numero_temporada10          Numero_temporada11
##              -1.563627e-01               -4.209794e-01
##         Numero_temporada12          Numero_temporada13
##              -2.426757e-01               -2.029289e-01
##         Numero_temporada14          Numero_temporada15
##              -1.503296e-01               -1.728260e-01
##                        (phi)
##               1.087589e+01
```

```
#Modelo com significância de 5%
modelo_betat_cauchit1 <- betareg(WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTP + PlusMinus, data = p
modelo_betat_cauchit1
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTP +
##     PlusMinus, data = playoffs_transformado, link = "cauchit")
##
## Coefficients (mean model with cauchit link):
## (Intercept)          PTS          FGM         `3PM`          FTM          FTP
##    -1.63714      2.58431     -5.16431     -2.59951     -2.57991      0.01812
##   PlusMinus
##     0.14998
##
## Phi coefficients (precision model with identity link):
## (phi)
## 7.694
```

```
summary(modelo_betat_cauchit1) #Pseudo R-squared: 0.2909
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTP +
##     PlusMinus, data = playoffs_transformado, link = "cauchit")
##
```

```
## Standardized weighted residuals 2:
##     Min      1Q  Median      3Q     Max
## -5.9272 -0.4067  0.1987  0.6120  1.6024
##
## Coefficients (mean model with cauchit link):
##             Estimate Std. Error z value Pr(>|z|)
## (Intercept) -1.63714    1.05672  -1.549 0.121317
## PTS          2.58431    0.73536   3.514 0.000441 ***
## FGM         -5.16431    1.47211  -3.508 0.000451 ***
## `3PM`       -2.59951    0.73425  -3.540 0.000400 ***
## FTM         -2.57991    0.73304  -3.519 0.000432 ***
## FTP          0.01812    0.01077   1.682 0.092534 .
## PlusMinus    0.14998    0.01192  12.579  < 2e-16 ***
##
## Phi coefficients (precision model with identity link):
##       Estimate Std. Error z value Pr(>|z|)
## (phi)   7.6938     0.6746    11.4   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Type of estimator: ML (maximum likelihood)
## Log-likelihood:   161 on 8 Df
## Pseudo R-squared: 0.2937
## Number of iterations: 111 (BFGS) + 5 (Fisher scoring)
```

```
coef(modelo_betat_cauchit1)
```

```
## (Intercept)         PTS         FGM       `3PM`         FTM         FTP
##  -1.6371388   2.5843094  -5.1643074  -2.5995114  -2.5799126   0.0181221
##   PlusMinus       (phi)
##   0.1499767   7.6937700
```

```
#Modelo com significância de 10%
modelo_betat_cauchit2 <- betareg(WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTA + FTP + OREB + DREB +
modelo_betat_cauchit2
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTA +
##     FTP + OREB + DREB + REB + PlusMinus, data = playoffs_transformado,
##     link = "cauchit")
##
## Coefficients (mean model with cauchit link):
## (Intercept)          PTS          FGM        `3PM`          FTM          FTA
##     -9.7011       2.3796      -4.7633      -2.3983      -2.7671       0.2994
##         FTP         OREB         DREB          REB    PlusMinus
##      0.1146      -1.8013      -1.7683       1.8006       0.1464
##
## Phi coefficients (precision model with identity link):
## (phi)
## 7.986
```

```
summary(modelo_betat_cauchit2) #Pseudo R-squared: 0.3149
```

```
##
## Call:
```

```
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTA +
##     FTP + OREB + DREB + REB + PlusMinus, data = playoffs_transformado,
##     link = "cauchit")
##
## Standardized weighted residuals 2:
##     Min      1Q  Median      3Q     Max
## -5.3469 -0.3905  0.1848  0.6120  1.6377
##
## Coefficients (mean model with cauchit link):
##             Estimate Std. Error z value Pr(>|z|)
## (Intercept) -9.70109    4.31244  -2.250 0.024477 *
## PTS          2.37961    0.72940   3.262 0.001105 **
## FGM         -4.76325    1.46046  -3.261 0.001108 **
## `3PM`       -2.39832    0.72779  -3.295 0.000983 ***
## FTM         -2.76708    0.78849  -3.509 0.000449 ***
## FTA          0.29939    0.17164   1.744 0.081103 .
## FTP          0.11459    0.05615   2.041 0.041251 *
## OREB        -1.80132    0.94867  -1.899 0.057591 .
## DREB        -1.76827    0.94882  -1.864 0.062369 .
## REB          1.80060    0.94960   1.896 0.057937 .
## PlusMinus    0.14642    0.01180  12.413  < 2e-16 ***
##
## Phi coefficients (precision model with identity link):
##       Estimate Std. Error z value Pr(>|z|)
## (phi)   7.9857     0.7011   11.39   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Type of estimator: ML (maximum likelihood)
## Log-likelihood: 165.9 on 12 Df
## Pseudo R-squared: 0.3149
## Number of iterations: 236 (BFGS) + 5 (Fisher scoring)
```

```
coef(modelo_betat_cauchit2)
```

```
## (Intercept)         PTS         FGM       `3PM`         FTM         FTA
##  -9.7010861   2.3796099  -4.7632523  -2.3983232  -2.7670839   0.2993944
##         FTP        OREB        DREB         REB   PlusMinus       (phi)
##   0.1145924  -1.8013212  -1.7682748   1.8006027   0.1464193   7.9856513
```

```
######## Anova ########
##### Logito ####
modelo_betapt1
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ ., data = playoffs_transformado)
##
## Coefficients (mean model with logit link):
##                 (Intercept)          TEAMBoston Celtics
##                   -16.325190                   -0.147371
##          TEAMBrooklyn Nets       TEAMCharlotte Bobcats
##                    -0.934181                   -2.404465
##      TEAMCharlotte Hornets           TEAMChicago Bulls
##                     1.087084                   -0.182236
```

```
##    TEAMCleveland Cavaliers        TEAMDallas Mavericks
##                  -0.185620                   -0.477447
##         TEAMDenver Nuggets         TEAMDetroit Pistons
##                  -0.193453                   -2.196518
##  TEAMGolden State Warriors         TEAMHouston Rockets
##                  -0.038318                    0.049807
##         TEAMIndiana Pacers             TEAMLA Clippers
##                  -1.147663                   -0.571242
##   TEAMLos Angeles Clippers      TEAMLos Angeles Lakers
##                  -0.081451                   -0.194850
##      TEAMMemphis Grizzlies             TEAMMiami Heat
##                   0.160823                   -0.233849
##        TEAMMilwaukee Bucks  TEAMMinnesota Timberwolves
##                  -0.377493                   -0.138514
##    TEAMNew Orleans Hornets    TEAMNew Orleans Pelicans
##                   0.890152                   -0.879194
##        TEAMNew York Knicks   TEAMOklahoma City Thunder
##                  -0.796348                   -0.090179
##          TEAMOrlando Magic      TEAMPhiladelphia 76ers
##                  -0.480280                   -0.409600
##           TEAMPhoenix Suns  TEAMPortland Trail Blazers
##                  -0.048300                   -0.281721
##       TEAMSacramento Kings       TEAMSan Antonio Spurs
##                  -0.046683                   -0.398991
##        TEAMToronto Raptors               TEAMUtah Jazz
##                   0.088496                   -0.295102
##     TEAMWashington Wizards                          PTS
##                  -0.017043                    1.843900
##                        FGM                          FGA
##                  -3.900351                    0.074277
##                        FGP                         `3PM`
##                   0.179035                   -1.965068
##                       `3PA`                        `3PP`
##                   0.041658                    0.036071
##                        FTM                          FTA
##                  -2.285711                    0.339323
##                        FTP                         OREB
##                   0.112855                   -2.018812
##                       DREB                          REB
##                  -2.019840                    2.064153
##                        AST                          TOV
##                   0.012491                   -0.008793
##                        STL                          BLK
##                  -0.030724                   -0.045358
##                       BLKA                           PF
##                  -0.068158                   -0.023614
##                        PFD                    PlusMinus
##                  -0.015906                    0.131835
##          Numero_temporada2           Numero_temporada3
##                  -0.027338                   -0.210501
##          Numero_temporada4           Numero_temporada5
##                  -0.139984                   -0.050433
##          Numero_temporada6           Numero_temporada7
##                  -0.013163                   -0.393290
```

```
##          Numero_temporada8           Numero_temporada9
##                  -0.198060                   -0.313883
##         Numero_temporada10          Numero_temporada11
##                  -0.186817                   -0.306833
##         Numero_temporada12          Numero_temporada13
##                  -0.233772                   -0.164900
##         Numero_temporada14          Numero_temporada15
##                  -0.179774                   -0.195035
##
## Phi coefficients (precision model with identity link):
## (phi)
## 14.28
```

```
modelo_betapt11 #PTS + FGM + `3PM` + FTM + FTP + OREB + DREB +REB + PlusMinus
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTP +
##     OREB + DREB + REB + PlusMinus, data = playoffs_transformado)
##
## Coefficients (mean model with logit link):
## (Intercept)          PTS          FGM        `3PM`          FTM          FTP
##    -2.56901      2.49719     -4.99637     -2.51458     -2.49227      0.01742
##        OREB         DREB          REB    PlusMinus
##    -2.91943     -2.88928      2.92531      0.14453
##
## Phi coefficients (precision model with identity link):
## (phi)
## 9.634
```

```
modelo_betapt12 #PTS + FGM + `3PM` + FTM +       OREB + DREB + REB+ PlusMinus
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + OREB +
##     DREB + REB + PlusMinus, data = playoffs_transformado)
##
## Coefficients (mean model with logit link):
## (Intercept)          PTS          FGM        `3PM`          FTM         OREB
##     -1.3804       2.6685      -5.3398      -2.6796      -2.6543      -2.7564
##        DREB          REB    PlusMinus
##     -2.7230       2.7586       0.1442
##
## Phi coefficients (precision model with identity link):
## (phi)
## 9.493
```

```
modelo_betapt13 #PTS + FGM + `3PM` + FTM +FTA+FTP+OREB + DREB + REB + PlusMinus
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTA +
##     FTP + OREB + DREB + REB + PlusMinus, data = playoffs_transformado)
##
## Coefficients (mean model with logit link):
## (Intercept)          PTS          FGM        `3PM`          FTM          FTA
```

```
##     -8.6232       2.5595      -5.1243      -2.5754      -2.8951       0.2600
##         FTP         OREB         DREB          REB    PlusMinus
##      0.0977      -2.7123      -2.6841       2.7201       0.1442
##
## Phi coefficients (precision model with identity link):
## (phi)
## 9.747
```

```
modelo_betapt_plus <- betareg(WINP_transformado ~ PlusMinus ,data = playoffs_transformado) #Regressão c
modelo_betapt_reb <- betareg(WINP_transformado ~ REB + PlusMinus ,data = playoffs_transformado) #Regres
modelo_betapt_reb <- betareg(WINP_transformado ~ REB + PlusMinus ,data = playoffs_transformado) #Regres
modelo_betapt_dreb <- betareg(WINP_transformado ~ DREB + REB + PlusMinus ,data = playoffs_transformado)
modelo_betapt_oreb <- betareg(WINP_transformado ~ OREB + REB + PlusMinus ,data = playoffs_transformado)
modelo_betapt_ftm <- betareg(WINP_transformado ~ FTM + REB + PlusMinus ,data = playoffs_transformado) #
modelo_betapt_3pm <- betareg(WINP_transformado ~ `3PM` + REB + PlusMinus ,data = playoffs_transformado)
modelo_betapt_fgm <- betareg(WINP_transformado ~ FGM + REB + PlusMinus ,data = playoffs_transformado) #
modelo_betapt_pts <- betareg(WINP_transformado ~ PTS + REB + PlusMinus ,data = playoffs_transformado) #
modelo_betapt_ftp <- betareg(WINP_transformado ~ FTP + REB + PlusMinus ,data = playoffs_transformado) #
modelo_betapt_fta <- betareg(WINP_transformado ~ FTA + FTP + REB + PlusMinus ,data = playoffs_transforma
```

```
lrtest(modelo_betapt_plus, modelo_betapt_reb)#0.056 REB foi significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ PlusMinus
## Model 2: WINP_transformado ~ REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   3 164.95
## 2   4 166.77  1 3.6372     0.0565 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
lrtest(modelo_betapt_reb, modelo_betapt_dreb) #0.4961, DREB não foi significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
## Model 2: WINP_transformado ~ DREB + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 166.77
## 2   5 167.00  1 0.4633     0.4961
```

```
lrtest(modelo_betapt_reb, modelo_betapt_oreb) #0.4356, OREB não foi significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
## Model 2: WINP_transformado ~ OREB + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 166.77
## 2   5 167.07  1 0.6078     0.4356
```

```
lrtest(modelo_betapt_reb, modelo_betapt_ftm) #0.5347, FTM não foi significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
```

```
## Model 2: WINP_transformado ~ FTM + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 166.77
## 2   5 166.96  1 0.3854     0.5347
```

```
lrtest(modelo_betapt_reb, modelo_betapt_3pm) #0.5708, 3PM não foi significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
## Model 2: WINP_transformado ~ `3PM` + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 166.77
## 2   5 166.93  1 0.3213     0.5708
```

```
lrtest(modelo_betapt_reb, modelo_betapt_fgm) #0.5481, FGM não foi significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
## Model 2: WINP_transformado ~ FGM + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 166.77
## 2   5 166.95  1 0.3607     0.5481
```

```
lrtest(modelo_betapt_reb, modelo_betapt_pts) #0.6963, PTS não foi significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
## Model 2: WINP_transformado ~ PTS + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 166.77
## 2   5 166.84  1 0.1524     0.6963
```

```
lrtest(modelo_betapt_reb, modelo_betapt_ftp) #0.05651, FTP  foi significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
## Model 2: WINP_transformado ~ FTP + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 166.77
## 2   5 168.59  1 3.6369    0.05651 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
lrtest(modelo_betapt_ftp, modelo_betapt_fta) #0.7973, FTA  não foi significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ FTP + REB + PlusMinus
## Model 2: WINP_transformado ~ FTA + FTP + REB + PlusMinus
##   #Df LogLik Df Chisq Pr(>Chisq)
## 1   5 168.59
## 2   6 168.62  1 0.066     0.7973
```

```r
#Melhor modelo foi modelo_betapt_ftp que contém FTP + REB + PlusMinus
##### loglog #####
modelo_betat_loglog
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ ., data = playoffs_transformado,
##     link = "loglog")
##
## Coefficients (mean model with loglog link):
##                (Intercept)          TEAMBoston Celtics
##                 -1.342e+01                  -7.466e-02
##          TEAMBrooklyn Nets       TEAMCharlotte Bobcats
##                 -4.014e-01                  -7.917e-01
##      TEAMCharlotte Hornets           TEAMChicago Bulls
##                  6.821e-01                  -1.422e-01
##    TEAMCleveland Cavaliers        TEAMDallas Mavericks
##                  3.988e-02                  -3.021e-01
##         TEAMDenver Nuggets         TEAMDetroit Pistons
##                 -1.133e-01                  -7.033e-01
##  TEAMGolden State Warriors         TEAMHouston Rockets
##                  9.793e-02                   2.181e-02
##         TEAMIndiana Pacers             TEAMLA Clippers
##                 -7.269e-01                  -2.129e-01
##   TEAMLos Angeles Clippers      TEAMLos Angeles Lakers
##                 -4.330e-02                  -2.464e-02
##      TEAMMemphis Grizzlies              TEAMMiami Heat
##                  1.283e-01                  -5.556e-02
##        TEAMMilwaukee Bucks  TEAMMinnesota Timberwolves
##                 -1.694e-01                  -8.941e-02
##    TEAMNew Orleans Hornets    TEAMNew Orleans Pelicans
##                  6.967e-01                  -5.075e-01
##        TEAMNew York Knicks   TEAMOklahoma City Thunder
##                 -4.919e-01                  -7.193e-02
##          TEAMOrlando Magic      TEAMPhiladelphia 76ers
##                 -1.797e-01                  -2.146e-01
##           TEAMPhoenix Suns  TEAMPortland Trail Blazers
##                  1.838e-01                  -1.999e-01
##       TEAMSacramento Kings       TEAMSan Antonio Spurs
##                 -1.019e-01                  -1.607e-01
##        TEAMToronto Raptors               TEAMUtah Jazz
##                  1.198e-01                  -2.327e-01
##     TEAMWashington Wizards                        PTS
##                  1.066e-01                   1.356e+00
##                        FGM                        FGA
##                 -2.963e+00                   9.342e-02
##                        FGP                       `3PM`
##                  2.092e-01                  -1.373e+00
##                      `3PA`                       `3PP`
##                  1.009e-02                   8.780e-03
##                        FTM                        FTA
##                 -1.583e+00                   1.642e-01
##                        FTP                       OREB
##                  5.879e-02                  -1.446e+00
```

```
##                      DREB                       REB
##                -1.447e+00                  1.488e+00
##                       AST                       TOV
##                 6.000e-03                 -1.245e-02
##                       STL                       BLK
##                 1.831e-02                 -2.358e-02
##                      BLKA                        PF
##                -2.423e-02                 -5.701e-03
##                       PFD                  PlusMinus
##                 3.976e-05                  7.148e-02
##          Numero_temporada2          Numero_temporada3
##                -3.550e-02                 -1.717e-01
##          Numero_temporada4          Numero_temporada5
##                -1.665e-01                 -6.682e-02
##          Numero_temporada6          Numero_temporada7
##                -5.465e-02                 -3.281e-01
##          Numero_temporada8          Numero_temporada9
##                -1.503e-01                 -2.809e-01
##         Numero_temporada10         Numero_temporada11
##                -2.305e-01                 -1.742e-01
##         Numero_temporada12         Numero_temporada13
##                -1.689e-01                 -1.761e-01
##         Numero_temporada14         Numero_temporada15
##                -2.550e-01                 -2.089e-01
##
## Phi coefficients (precision model with identity link):
## (phi)
## 16.14
```

```
modelo_betat_loglog1 #PTS + FGM + `3PM` + FTM + OREB + DREB + REB + PlusMinus
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + OREB +
##     DREB + REB + PlusMinus, data = playoffs_transformado, link = "loglog")
##
## Coefficients (mean model with loglog link):
## (Intercept)          PTS          FGM        `3PM`          FTM         OREB
##    -0.61089      1.70104     -3.40418     -1.70574     -1.69784     -2.08042
##        DREB          REB    PlusMinus
##    -2.06192      2.08895      0.07889
##
## Phi coefficients (precision model with identity link):
## (phi)
## 9.889
```

```
modelop_loglog_plus <- betareg(formula = WINP_transformado ~ PlusMinus, data = playoffs_transformado, li
modelop_loglog_reb <- betareg(formula = WINP_transformado ~ REB + PlusMinus,data = playoffs_transformado
modelop_loglog_dreb <- betareg(formula = WINP_transformado ~ DREB + REB + PlusMinus,data = playoffs_tran
modelop_loglog_oreb <- betareg(formula = WINP_transformado ~ OREB + REB + PlusMinus,data = playoffs_tran
modelop_loglog_ftm <- betareg(formula = WINP_transformado ~ FTM + REB + PlusMinus,data = playoffs_transi
modelop_loglog_3pm <- betareg(formula = WINP_transformado ~ `3PM` + REB + PlusMinus,data = playoffs_tran
modelop_loglog_fgm <- betareg(formula = WINP_transformado ~ FGM + REB + PlusMinus,data = playoffs_transi
modelop_loglog_pts <- betareg(formula = WINP_transformado ~ PTS + REB + PlusMinus,data = playoffs_transi
```

```
lrtest(modelop_loglog_plus, modelop_loglog_reb)#0.006634 REB foi significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ PlusMinus
## Model 2: WINP_transformado ~ REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   3 158.59
## 2   4 162.28  1 7.3694   0.006634 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
lrtest(modelop_loglog_reb, modelop_loglog_dreb)#0.4797 DREB não foi significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
## Model 2: WINP_transformado ~ DREB + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 162.28
## 2   5 162.53  1 0.4996     0.4797
```

```
lrtest(modelop_loglog_reb, modelop_loglog_oreb)#0.4129 OREB não foi significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
## Model 2: WINP_transformado ~ OREB + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 162.28
## 2   5 162.61  1 0.6705     0.4129
```

```
lrtest(modelop_loglog_reb, modelop_loglog_ftm)#0.7688 FTM não foi significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
## Model 2: WINP_transformado ~ FTM + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 162.28
## 2   5 162.32  1 0.0864     0.7688
```

```
lrtest(modelop_loglog_reb, modelop_loglog_3pm)#0.8251 3PM não foi significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
## Model 2: WINP_transformado ~ `3PM` + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 162.28
## 2   5 162.30  1 0.0489     0.8251
```

```
lrtest(modelop_loglog_reb, modelop_loglog_fgm)#0.6389 FGM não foi significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
```

```
## Model 2: WINP_transformado ~ FGM + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 162.28
## 2   5 162.39  1 0.2202     0.6389
```

```
lrtest(modelop_loglog_reb, modelop_loglog_pts)#0.7887 PTS não foi significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
## Model 2: WINP_transformado ~ PTS + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 162.28
## 2   5 162.31  1 0.0718     0.7887
```

```
#Melhor modelo foi o modelop_loglog_reb com REB + PlusMinus
##### Probito ####
modelo_betat_probit
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ ., data = playoffs_transformado,
##     link = "probit")
##
## Coefficients (mean model with probit link):
##                (Intercept)          TEAMBoston Celtics
##                  -10.662599                   -0.086658
##          TEAMBrooklyn Nets       TEAMCharlotte Bobcats
##                   -0.523090                   -1.163753
##      TEAMCharlotte Hornets           TEAMChicago Bulls
##                    0.661968                   -0.119892
##    TEAMCleveland Cavaliers        TEAMDallas Mavericks
##                   -0.091981                   -0.287337
##         TEAMDenver Nuggets         TEAMDetroit Pistons
##                   -0.117525                   -1.028516
##  TEAMGolden State Warriors         TEAMHouston Rockets
##                   -0.011340                    0.035815
##         TEAMIndiana Pacers             TEAMLA Clippers
##                   -0.709766                   -0.297403
##   TEAMLos Angeles Clippers      TEAMLos Angeles Lakers
##                   -0.042717                   -0.096454
##      TEAMMemphis Grizzlies              TEAMMiami Heat
##                    0.101127                   -0.113469
##        TEAMMilwaukee Bucks  TEAMMinnesota Timberwolves
##                   -0.212419                   -0.095396
##    TEAMNew Orleans Hornets    TEAMNew Orleans Pelicans
##                    0.581474                   -0.542289
##        TEAMNew York Knicks   TEAMOklahoma City Thunder
##                   -0.492985                   -0.059127
##          TEAMOrlando Magic      TEAMPhiladelphia 76ers
##                   -0.251226                   -0.246610
##           TEAMPhoenix Suns  TEAMPortland Trail Blazers
##                    0.007733                   -0.184964
##       TEAMSacramento Kings       TEAMSan Antonio Spurs
##                   -0.047851                   -0.224810
```

```
##        TEAMToronto Raptors                TEAMUtah Jazz
##                   0.059834                    -0.190086
##     TEAMWashington Wizards                           PTS
##                   0.014843                     1.146786
##                        FGM                          FGA
##                  -2.449863                     0.055655
##                        FGP                         `3PM`
##                   0.130216                    -1.207974
##                       `3PA`                        `3PP`
##                   0.021624                     0.019587
##                        FTM                          FTA
##                  -1.395996                     0.188696
##                        FTP                         OREB
##                   0.064294                    -1.281249
##                       DREB                          REB
##                  -1.282804                     1.313036
##                        AST                          TOV
##                   0.007756                    -0.005995
##                        STL                          BLK
##                  -0.009544                    -0.026090
##                       BLKA                           PF
##                  -0.035819                    -0.011062
##                        PFD                    PlusMinus
##                  -0.007036                     0.076451
##          Numero_temporada2           Numero_temporada3
##                  -0.016874                    -0.131976
##          Numero_temporada4           Numero_temporada5
##                  -0.099483                    -0.036310
##          Numero_temporada6           Numero_temporada7
##                  -0.017154                    -0.250792
##          Numero_temporada8           Numero_temporada9
##                  -0.121930                    -0.205626
##         Numero_temporada10          Numero_temporada11
##                  -0.130307                    -0.163261
##         Numero_temporada12          Numero_temporada13
##                  -0.136980                    -0.106495
##         Numero_temporada14          Numero_temporada15
##                  -0.130224                    -0.123475
##
## Phi coefficients (precision model with identity link):
## (phi)
## 14.86
```

```
modelo_betat_probit1 #PTS + FGM + `3PM` + FTM +      FTP + OREB + DREB + REB + PlusMinus
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTP +
##     OREB + DREB + REB + PlusMinus, data = playoffs_transformado, link = "probit")
##
## Coefficients (mean model with probit link):
## (Intercept)          PTS          FGM         `3PM`          FTM          FTP
##   -1.498009     1.525395    -3.052708    -1.534551    -1.522960     0.009347
##        OREB         DREB          REB    PlusMinus
##   -1.858890    -1.841910     1.864733     0.084387
```

```
##
## Phi coefficients (precision model with identity link):
## (phi)
## 9.824
```

```
modelo_betat_probit2 #PTS + FGM + `3PM` + FTM + FTA + FTP + OREB +DREB + REB + PlusMinus
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTA +
##     FTP + OREB + DREB + REB + PlusMinus, data = playoffs_transformado,
##     link = "probit")
##
## Coefficients (mean model with probit link):
## (Intercept)          PTS          FGM         `3PM`          FTM          FTA
##    -4.66848      1.55940     -3.12236     -1.56768     -1.73660      0.13721
##         FTP         OREB         DREB          REB    PlusMinus
##     0.05141     -1.74539     -1.72933      1.75204      0.08412
##
## Phi coefficients (precision model with identity link):
## (phi)
## 9.928
```

```
modelop_probit_plus <- betareg(formula = WINP_transformado ~ PlusMinus, data = playoffs_transformado, li
modelop_probit_reb <- betareg(formula = WINP_transformado ~ REB + PlusMinus, data = playoffs_transforma
modelop_probit_dreb <- betareg(formula = WINP_transformado ~ DREB + REB + PlusMinus, data = playoffs_tra
modelop_probit_oreb <- betareg(formula = WINP_transformado ~ OREB + REB + PlusMinus, data = playoffs_tra
modelop_probit_ftp <- betareg(formula = WINP_transformado ~ FTP + REB + PlusMinus, data = playoffs_trans
modelop_probit_fta <- betareg(formula = WINP_transformado ~ FTA + FTP + REB + PlusMinus, data = playoffs
modelop_probit_ftm <- betareg(formula = WINP_transformado ~ FTM + FTP + REB + PlusMinus, data = playoffs
modelop_probit_3pm <- betareg(formula = WINP_transformado ~ `3PM` + FTP + REB + PlusMinus, data = playo
modelop_probit_fgm <- betareg(formula = WINP_transformado ~ FGM + FTP + REB + PlusMinus, data = playoffs
modelop_probit_pts <- betareg(formula = WINP_transformado ~ PTS + FTP + REB + PlusMinus, data = playoffs

lrtest(modelo_betat_probit1, modelo_betat_probit2) #0.1401,  FTA não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTP + OREB + DREB +
##     REB + PlusMinus
## Model 2: WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTA + FTP + OREB +
##     DREB + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1  11 184.06
## 2  12 185.15  1 2.1773     0.1401
```

```
lrtest(modelop_probit_plus, modelop_probit_reb) #0.03236,  REB deu significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ PlusMinus
## Model 2: WINP_transformado ~ REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   3 164.21
## 2   4 166.50  1 4.5795    0.03236 *
## ---
```

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

```
lrtest(modelop_probit_reb, modelop_probit_dreb) #0.5235,  DREB deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
## Model 2: WINP_transformado ~ DREB + REB + PlusMinus
##   #Df LogLik Df Chisq Pr(>Chisq)
## 1   4  166.5
## 2   5  166.7  1 0.407     0.5235
```

```
lrtest(modelop_probit_reb, modelop_probit_oreb) # 0.4588,  OREB deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
## Model 2: WINP_transformado ~ OREB + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 166.50
## 2   5 166.77  1 0.5489     0.4588
```

```
lrtest(modelop_probit_reb, modelop_probit_ftp) # 0.0691,  FTP deu significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
## Model 2: WINP_transformado ~ FTP + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 166.50
## 2   5 168.15  1 3.3042     0.0691 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
lrtest(modelop_probit_ftp, modelop_probit_fta) #0.834, FTA deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ FTP + REB + PlusMinus
## Model 2: WINP_transformado ~ FTA + FTP + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   5 168.15
## 2   6 168.17  1 0.0439      0.834
```

```
lrtest(modelop_probit_ftp, modelop_probit_ftm) #0.9295, FTM deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ FTP + REB + PlusMinus
## Model 2: WINP_transformado ~ FTM + FTP + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   5 168.15
## 2   6 168.16  1 0.0078     0.9295
```

```
lrtest(modelop_probit_ftp, modelop_probit_3pm) #0.4011, 3PM deu não significativo
```

```
## Likelihood ratio test
##
```

```
## Model 1: WINP_transformado ~ FTP + REB + PlusMinus
## Model 2: WINP_transformado ~ `3PM` + FTP + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   5 168.15
## 2   6 168.50  1 0.7051     0.4011
```

```
lrtest(modelop_probit_ftp, modelop_probit_fgm) #0.4889, FGM deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ FTP + REB + PlusMinus
## Model 2: WINP_transformado ~ FGM + FTP + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   5 168.15
## 2   6 168.39  1 0.4789     0.4889
```

```
lrtest(modelop_probit_ftp, modelop_probit_pts) #0.4339, PTS deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ FTP + REB + PlusMinus
## Model 2: WINP_transformado ~ PTS + FTP + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   5 168.15
## 2   6 168.46  1 0.6125     0.4339
```

```
#Melhor modelo é modelop_probit_ftp com FTP + REB + PlusMinus
##### cloglog ####
modelo_betat_cloglog
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ ., data = playoffs_transformado,
##     link = "cloglog")
##
## Coefficients (mean model with cloglog link):
##                (Intercept)          TEAMBoston Celtics
##                  -12.343521                   -0.148632
##          TEAMBrooklyn Nets       TEAMCharlotte Bobcats
##                   -0.825668                   -2.347560
##      TEAMCharlotte Hornets           TEAMChicago Bulls
##                    0.832027                   -0.156684
##    TEAMCleveland Cavaliers        TEAMDallas Mavericks
##                   -0.299117                   -0.370233
##         TEAMDenver Nuggets         TEAMDetroit Pistons
##                   -0.202224                   -2.088603
##  TEAMGolden State Warriors         TEAMHouston Rockets
##                   -0.139022                    0.047597
##         TEAMIndiana Pacers             TEAMLA Clippers
##                   -0.912518                   -0.466035
##   TEAMLos Angeles Clippers      TEAMLos Angeles Lakers
##                   -0.063292                   -0.225173
##      TEAMMemphis Grizzlies              TEAMMiami Heat
##                    0.102694                   -0.237603
##        TEAMMilwaukee Bucks  TEAMMinnesota Timberwolves
##                   -0.331142                   -0.161577
```

```
##    TEAMNew Orleans Hornets    TEAMNew Orleans Pelicans
##                   0.593752                   -0.741967
##        TEAMNew York Knicks   TEAMOklahoma City Thunder
##                  -0.669366                   -0.100785
##          TEAMOrlando Magic      TEAMPhiladelphia 76ers
##                  -0.493267                   -0.373430
##           TEAMPhoenix Suns  TEAMPortland Trail Blazers
##                  -0.174180                   -0.270599
##       TEAMSacramento Kings       TEAMSan Antonio Spurs
##                  -0.033814                   -0.403249
##        TEAMToronto Raptors               TEAMUtah Jazz
##                  -0.002904                   -0.247055
##     TEAMWashington Wizards                          PTS
##                  -0.048618                    1.252113
##                        FGM                          FGA
##                  -2.657001                    0.052831
##                        FGP                         `3PM`
##                   0.126592                   -1.351409
##                       `3PA`                         `3PP`
##                   0.032630                    0.031214
##                        FTM                          FTA
##                  -1.595749                    0.263474
##                        FTP                         OREB
##                   0.087354                   -1.508288
##                       DREB                          REB
##                  -1.513310                    1.542553
##                        AST                          TOV
##                   0.006724                   -0.005986
##                        STL                          BLK
##                  -0.045544                   -0.034457
##                       BLKA                           PF
##                  -0.053021                   -0.013860
##                        PFD                    PlusMinus
##                  -0.013089                    0.102547
##          Numero_temporada2           Numero_temporada3
##                   0.015925                   -0.094511
##          Numero_temporada4           Numero_temporada5
##                  -0.060602                   -0.017679
##          Numero_temporada6           Numero_temporada7
##                   0.000470                   -0.234363
##          Numero_temporada8           Numero_temporada9
##                  -0.136399                   -0.192557
##         Numero_temporada10          Numero_temporada11
##                  -0.066891                   -0.174354
##         Numero_temporada12          Numero_temporada13
##                  -0.110648                   -0.089623
##         Numero_temporada14          Numero_temporada15
##                  -0.034687                   -0.041505
##
## Phi coefficients (precision model with identity link):
## (phi)
##  12.6
```

```
modelo_betat_cloglog1 #PTS + FGM + `3PM` + FTM +       FTP + OREB + DREB + REB + PlusMinus
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTP +
##     OREB + DREB + REB + PlusMinus, data = playoffs_transformado, link = "cloglog")
##
## Coefficients (mean model with cloglog link):
## (Intercept)          PTS          FGM        `3PM`          FTM          FTP
##    -2.32075      1.73934     -3.48600     -1.75121     -1.73532      0.01524
##        OREB         DREB          REB    PlusMinus
##    -1.99649     -1.98159      2.00668      0.10966
##
## Phi coefficients (precision model with identity link):
## (phi)
## 8.759
```

```
modelo_betat_cloglog2 #PTS + FGM + `3PM` + FTM + FTA + FTP + OREB + DREB + REB + PlusMinus
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTA +
##     FTP + OREB + DREB + REB + PlusMinus, data = playoffs_transformado,
##     link = "cloglog")
##
## Coefficients (mean model with cloglog link):
## (Intercept)          PTS          FGM        `3PM`          FTM          FTA
##    -7.17404      1.80636     -3.62238     -1.81706     -2.07370      0.20721
##         FTP         OREB         DREB          REB    PlusMinus
##     0.07949     -1.83846     -1.82639      1.85116      0.10922
##
## Phi coefficients (precision model with identity link):
## (phi)
## 8.845
```

```
modelo_betat_cloglog_plus <- betareg(formula = WINP_transformado ~ PlusMinus, data = playoffs_transforma
modelo_betat_cloglog_reb <- betareg(formula = WINP_transformado ~ REB + PlusMinus, data = playoffs_trans
modelo_betat_cloglog_dreb <- betareg(formula = WINP_transformado ~ DREB + REB + PlusMinus, data = playo
modelo_betat_cloglog_oreb <- betareg(formula = WINP_transformado ~ OREB + REB + PlusMinus, data = playo
modelo_betat_cloglog_ftp <- betareg(formula = WINP_transformado ~ FTP + REB + PlusMinus, data = playoffs
modelo_betat_cloglog_fta <- betareg(formula = WINP_transformado ~ FTA + FTP + REB + PlusMinus, data = pl
modelo_betat_cloglog_ftm <- betareg(formula = WINP_transformado ~ FTM + FTP + REB + PlusMinus, data = pl
modelo_betat_cloglog_3pm <- betareg(formula = WINP_transformado ~ `3PM` + FTP + REB + PlusMinus, data =
modelo_betat_cloglog_fgm <- betareg(formula = WINP_transformado ~ FGM + FTP + REB + PlusMinus, data = pl
modelo_betat_cloglog_pts <- betareg(formula = WINP_transformado ~ PTS + FTP + REB + PlusMinus, data = pl

lrtest(modelo_betat_cloglog_plus, modelo_betat_cloglog2) #0.1141,  FTA não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ PlusMinus
## Model 2: WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTA + FTP + OREB +
##     DREB + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   3 158.84
```

```
## 2  12 174.89  9 32.103  0.0001911 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
lrtest(modelop_probit_plus, modelo_betat_cloglog_reb) #0.004715,  REB deu significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ PlusMinus
## Model 2: WINP_transformado ~ REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   3 164.21
## 2   4 160.22  1 7.9858   0.004715 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
lrtest(modelo_betat_cloglog_reb, modelo_betat_cloglog_dreb) #0.7577,  DREB deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
## Model 2: WINP_transformado ~ DREB + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 160.22
## 2   5 160.26  1 0.0952     0.7577
```

```
lrtest(modelo_betat_cloglog_reb, modelo_betat_cloglog_oreb) # 0.6921,  OREB deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
## Model 2: WINP_transformado ~ OREB + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 160.22
## 2   5 160.29  1 0.1569     0.6921
```

```
lrtest(modelo_betat_cloglog_reb, modelo_betat_cloglog_ftp) # 0.04811,  FTP deu significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ REB + PlusMinus
## Model 2: WINP_transformado ~ FTP + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 160.22
## 2   5 162.17  1 3.9062    0.04811 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
lrtest(modelo_betat_cloglog_ftp, modelo_betat_cloglog_fta) #0.6894, FTA deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ FTP + REB + PlusMinus
## Model 2: WINP_transformado ~ FTA + FTP + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   5 162.17
## 2   6 162.25  1 0.1597     0.6894
```

```r
lrtest(modelo_betat_cloglog_ftp, modelo_betat_cloglog_ftm) #0.7763, FTM deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ FTP + REB + PlusMinus
## Model 2: WINP_transformado ~ FTM + FTP + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   5 162.17
## 2   6 162.21  1 0.0808     0.7763
```

```r
lrtest(modelo_betat_cloglog_ftp, modelo_betat_cloglog_3pm) #0.2797, 3PM deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ FTP + REB + PlusMinus
## Model 2: WINP_transformado ~ `3PM` + FTP + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   5 162.17
## 2   6 162.75  1 1.1684     0.2797
```

```r
lrtest(modelo_betat_cloglog_ftp, modelo_betat_cloglog_fgm) #0.3304, FGM deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ FTP + REB + PlusMinus
## Model 2: WINP_transformado ~ FGM + FTP + REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   5 162.17
## 2   6 162.64  1 0.9473     0.3304
```

```r
lrtest(modelo_betat_cloglog_ftp, modelo_betat_cloglog_pts) #0.3, PTS deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ FTP + REB + PlusMinus
## Model 2: WINP_transformado ~ PTS + FTP + REB + PlusMinus
##   #Df LogLik Df Chisq Pr(>Chisq)
## 1   5 162.17
## 2   6 162.71  1 1.074        0.3
```

```r
#modelo_betat_cloglog_ftp foi o melhor modelo com FTP + REB + PlusMinus

##### Cauchito ####
modelo_betat_cauchit
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ ., data = playoffs_transformado,
##     link = "cauchit")
##
## Coefficients (mean model with cauchit link):
##                 (Intercept)          TEAMBoston Celtics
##                  -17.931687                   -0.182517
##          TEAMBrooklyn Nets       TEAMCharlotte Bobcats
##                   -1.021994                  -11.179160
##      TEAMCharlotte Hornets           TEAMChicago Bulls
##                    1.002774                   -0.154626
```

```
##    TEAMCleveland Cavaliers        TEAMDallas Mavericks
##                  -0.151301                   -0.456241
##         TEAMDenver Nuggets         TEAMDetroit Pistons
##                  -0.182403                  -10.677864
##  TEAMGolden State Warriors         TEAMHouston Rockets
##                  -0.008257                   -0.041857
##         TEAMIndiana Pacers             TEAMLA Clippers
##                  -0.934964                   -0.821003
##   TEAMLos Angeles Clippers      TEAMLos Angeles Lakers
##                  -0.172159                   -0.310183
##      TEAMMemphis Grizzlies             TEAMMiami Heat
##                   0.090486                   -0.413996
##        TEAMMilwaukee Bucks  TEAMMinnesota Timberwolves
##                  -0.398602                   -0.064306
##    TEAMNew Orleans Hornets    TEAMNew Orleans Pelicans
##                   0.616405                   -0.629833
##        TEAMNew York Knicks   TEAMOklahoma City Thunder
##                  -0.633976                   -0.094495
##          TEAMOrlando Magic      TEAMPhiladelphia 76ers
##                  -0.794379                   -0.386140
##           TEAMPhoenix Suns  TEAMPortland Trail Blazers
##                  -0.098695                   -0.217182
##       TEAMSacramento Kings       TEAMSan Antonio Spurs
##                   0.045260                   -0.434781
##        TEAMToronto Raptors               TEAMUtah Jazz
##                   0.036052                   -0.274575
##     TEAMWashington Wizards                          PTS
##                  -0.142167                    1.696946
##                        FGM                          FGA
##                  -3.631740                    0.097137
##                        FGP                         `3PM`
##                   0.205168                   -1.786075
##                       `3PA`                         `3PP`
##                   0.026618                    0.022352
##                        FTM                          FTA
##                  -2.225292                    0.410319
##                        FTP                         OREB
##                   0.132389                   -1.726693
##                       DREB                          REB
##                  -1.710673                    1.741969
##                        AST                          TOV
##                   0.000802                   -0.015104
##                        STL                          BLK
##                  -0.059032                   -0.042946
##                       BLKA                           PF
##                  -0.071196                   -0.038234
##                        PFD                    PlusMinus
##                  -0.012453                    0.141625
##          Numero_temporada2           Numero_temporada3
##                  -0.084809                   -0.178465
##          Numero_temporada4           Numero_temporada5
##                  -0.146221                   -0.064536
##          Numero_temporada6           Numero_temporada7
##                  -0.013495                   -0.380426
```

```
##          Numero_temporada8          Numero_temporada9
##                  -0.313855                  -0.197435
##         Numero_temporada10         Numero_temporada11
##                  -0.156363                  -0.420979
##         Numero_temporada12         Numero_temporada13
##                  -0.242676                  -0.202929
##         Numero_temporada14         Numero_temporada15
##                  -0.150330                  -0.172826
##
## Phi coefficients (precision model with identity link):
## (phi)
## 10.88
```

```
modelo_betat_cauchit1 #PTS + FGM + `3PM` + FTM + FTP +                    PlusMinus
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTP +
##     PlusMinus, data = playoffs_transformado, link = "cauchit")
##
## Coefficients (mean model with cauchit link):
## (Intercept)          PTS          FGM        `3PM`          FTM          FTP
##    -1.63714      2.58431     -5.16431     -2.59951     -2.57991      0.01812
##   PlusMinus
##     0.14998
##
## Phi coefficients (precision model with identity link):
## (phi)
## 7.694
```

```
modelo_betat_cauchit2 #PTS + FGM + `3PM` + FTM + FTA + FTP + OREB +DREB + REB + PlusMinus
```

```
##
## Call:
## betareg(formula = WINP_transformado ~ PTS + FGM + `3PM` + FTM + FTA +
##     FTP + OREB + DREB + REB + PlusMinus, data = playoffs_transformado,
##     link = "cauchit")
##
## Coefficients (mean model with cauchit link):
## (Intercept)          PTS          FGM        `3PM`          FTM          FTA
##     -9.7011       2.3796      -4.7633      -2.3983      -2.7671       0.2994
##         FTP         OREB         DREB          REB    PlusMinus
##      0.1146      -1.8013      -1.7683       1.8006       0.1464
##
## Phi coefficients (precision model with identity link):
## (phi)
## 7.986
```

```
modelo_betat_cauchit_plus <- betareg(formula = WINP_transformado ~ PlusMinus, data = playoffs_transforma
modelo_betat_cauchit_reb <- betareg(formula = WINP_transformado ~ REB + PlusMinus, data = playoffs_trans
modelo_betat_cauchit_dreb <- betareg(formula = WINP_transformado ~ DREB + PlusMinus, data = playoffs_tra
modelo_betat_cauchit_oreb <- betareg(formula = WINP_transformado ~ OREB + PlusMinus, data = playoffs_tra
modelo_betat_cauchit_ftp <- betareg(formula = WINP_transformado ~ FTP + PlusMinus, data = playoffs_trans
modelo_betat_cauchit_fta <- betareg(formula = WINP_transformado ~ FTA + FTP + PlusMinus, data = playoff
modelo_betat_cauchit_ftm <- betareg(formula = WINP_transformado ~ FTM + FTP + PlusMinus, data = playoff
modelo_betat_cauchit_3pm <- betareg(formula = WINP_transformado ~ `3PM` + FTP + PlusMinus, data = playo
```

```r
modelo_betat_cauchit_fgm <- betareg(formula = WINP_transformado ~ FGM + FTP + PlusMinus, data = playoffs
modelo_betat_cauchit_pts <- betareg(formula = WINP_transformado ~ PTS + FTP +PlusMinus, data = playoffs

lrtest(modelo_betat_cauchit_plus, modelo_betat_cauchit_reb) #0.2505,  REB deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ PlusMinus
## Model 2: WINP_transformado ~ REB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   3 153.09
## 2   4 153.75  1 1.3204     0.2505
```

```r
lrtest(modelo_betat_cauchit_plus, modelo_betat_cauchit_dreb) #0.1528,  DREB deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ PlusMinus
## Model 2: WINP_transformado ~ DREB + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   3 153.09
## 2   4 154.11  1 2.0444     0.1528
```

```r
lrtest(modelo_betat_cauchit_plus, modelo_betat_cauchit_oreb) # 0.9832,  OREB deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ PlusMinus
## Model 2: WINP_transformado ~ OREB + PlusMinus
##   #Df LogLik Df Chisq Pr(>Chisq)
## 1   3 153.09
## 2   4 153.09  1 4e-04     0.9832
```

```r
lrtest(modelo_betat_cauchit_plus, modelo_betat_cauchit_ftp) # 0.08719,  FTP deu significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ PlusMinus
## Model 2: WINP_transformado ~ FTP + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   3 153.09
## 2   4 154.55  1 2.9255    0.08719 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```r
lrtest(modelo_betat_cauchit_ftp, modelo_betat_cauchit_fta) #0.7643, FTA deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ FTP + PlusMinus
## Model 2: WINP_transformado ~ FTA + FTP + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 154.55
## 2   5 154.59  1 0.0899     0.7643
```

```r
lrtest(modelo_betat_cauchit_ftp, modelo_betat_cauchit_ftm) #0.7763, FTM deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ FTP + PlusMinus
## Model 2: WINP_transformado ~ FTM + FTP + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 154.55
## 2   5 154.57  1 0.0324     0.8572
```

```
lrtest(modelo_betat_cauchit_ftp, modelo_betat_cauchit_3pm) #0.3074, 3PM deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ FTP + PlusMinus
## Model 2: WINP_transformado ~ `3PM` + FTP + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 154.55
## 2   5 155.07  1 1.0417     0.3074
```

```
lrtest(modelo_betat_cauchit_ftp, modelo_betat_cauchit_fgm) #0.8358, FGM deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ FTP + PlusMinus
## Model 2: WINP_transformado ~ FGM + FTP + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 154.55
## 2   5 154.57  1 0.0429     0.8358
```

```
lrtest(modelo_betat_cauchit_ftp, modelo_betat_cauchit_pts) #0.6404, PTS deu não significativo
```

```
## Likelihood ratio test
##
## Model 1: WINP_transformado ~ FTP + PlusMinus
## Model 2: WINP_transformado ~ PTS + FTP + PlusMinus
##   #Df LogLik Df  Chisq Pr(>Chisq)
## 1   4 154.55
## 2   5 154.66  1 0.2182     0.6404
```

```
#Melhor modelo modelo_betat_cauchit_ftp com FTP + PlusMinus
######## Análise de resíduos ########

##### Logito #######
#### Modelo 1 ####
shapiro.test(modelo_betapt1$residuals) #p-value = 0.7859, normal
```

```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_betapt1$residuals
## W = 0.9841, p-value = 0.008748
```

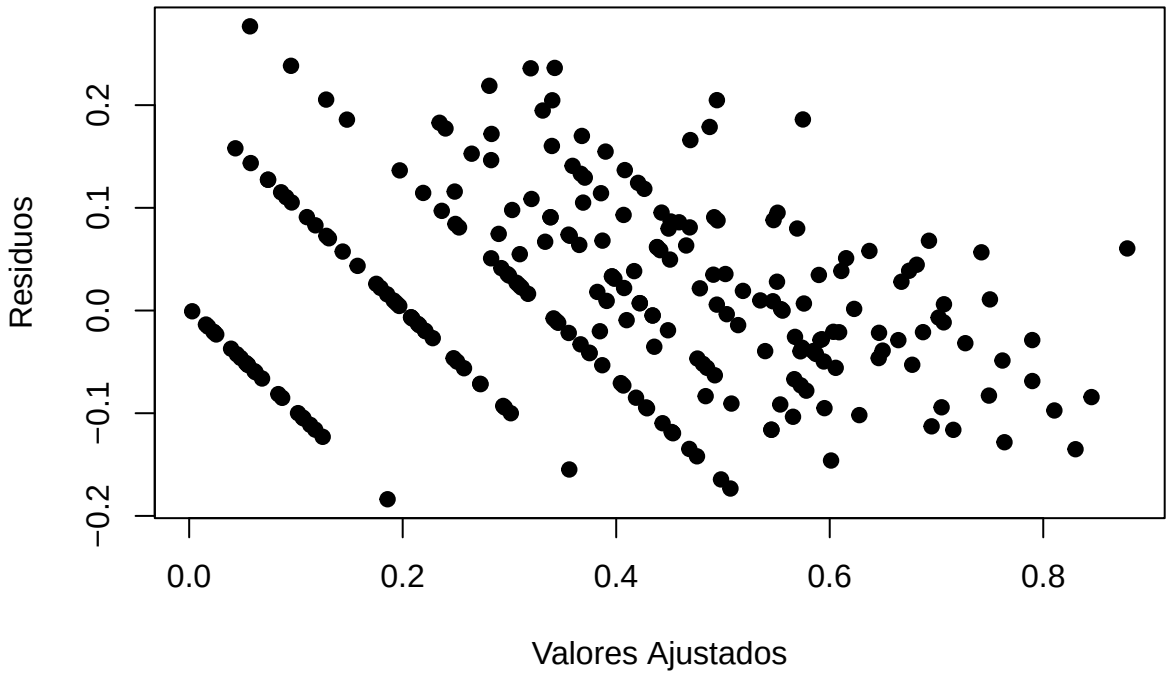
```
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_betapt1) #p-value = 0.1243
```

```
##
##  Durbin-Watson test
##
```

```
## data:  modelo_betapt1
## DW = 1.9021, p-value = 0.04183
## alternative hypothesis: true autocorrelation is greater than 0
```

```
#Independência
plot(modelo_betapt1$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```

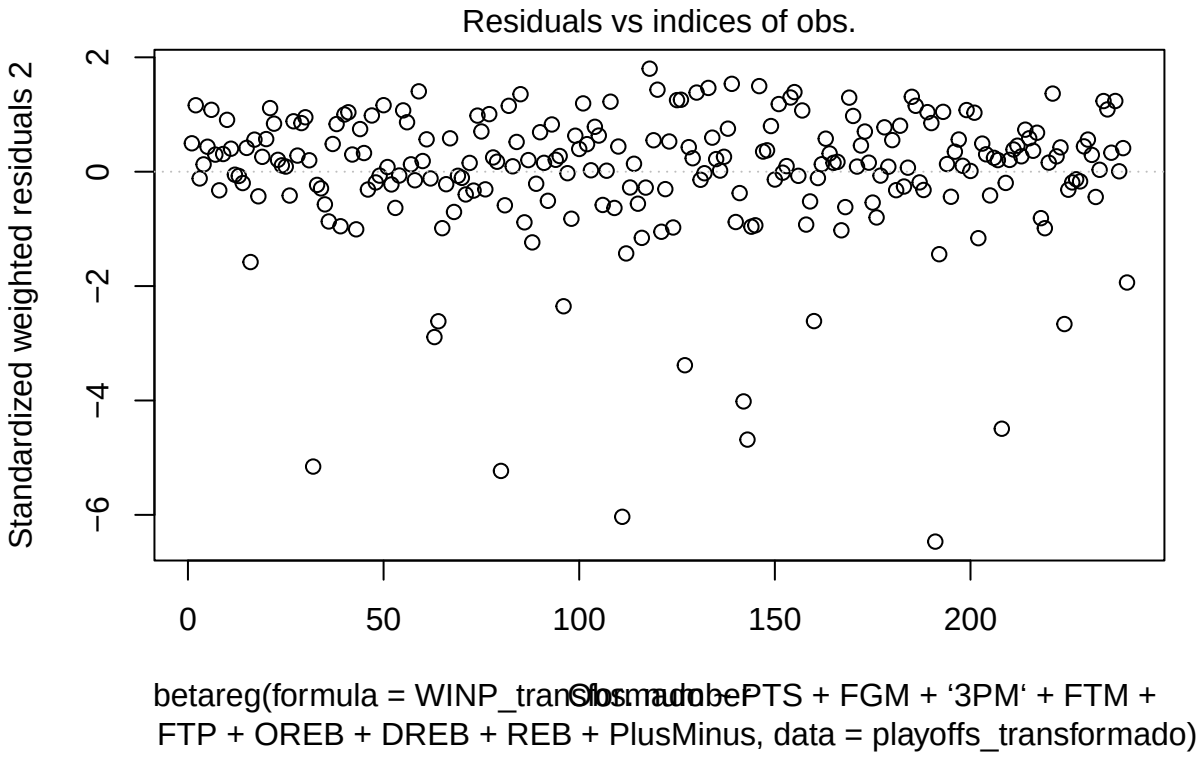

```
#Homocedasticidade
plot(modelo_betapt1$fitted.values, modelo_betapt1$residuals,
     xlab = "Valores Ajustados",
     ylab = "Residuos",
     pch = 19,
     main = "Suposição de homocedasticidade"
)
```



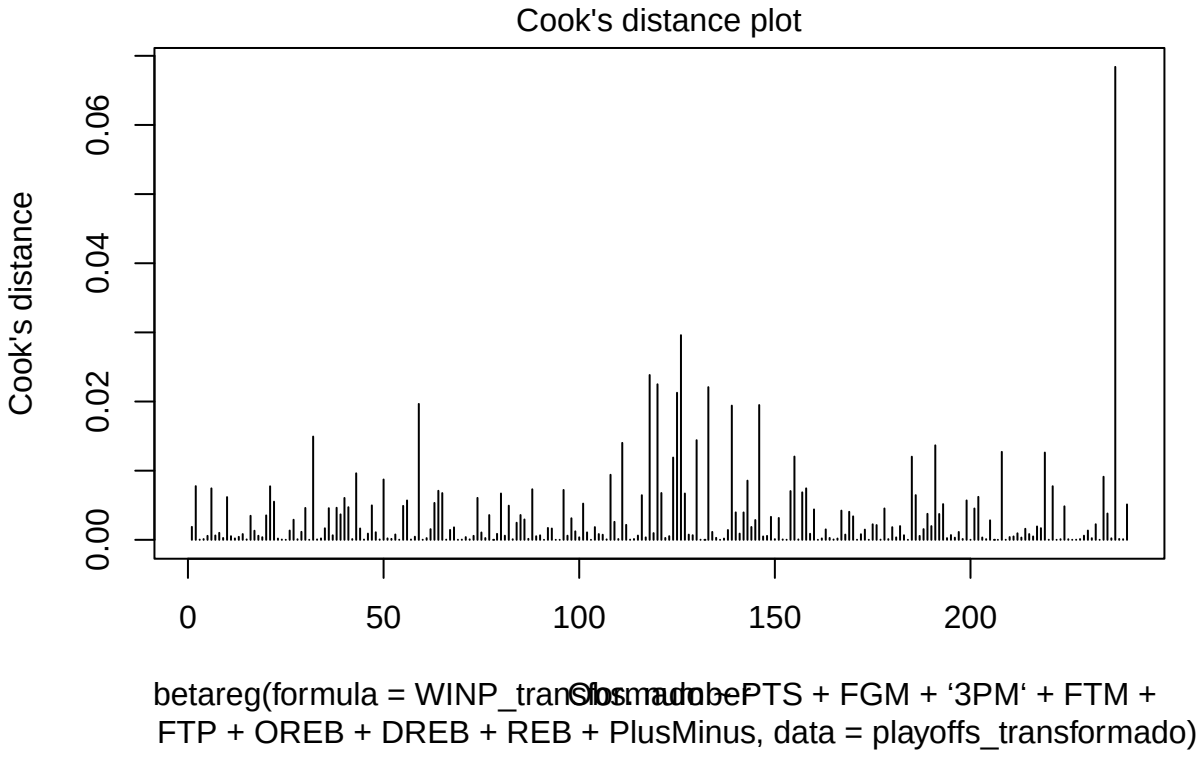

```
#Breusch_Pagan para homocedasticdade
bptest(modelo_betapt1) #p-value = 0.004251, heterocedasticidade
```

```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_betapt1
## BP = 88.168, df = 67, p-value = 0.04258
```

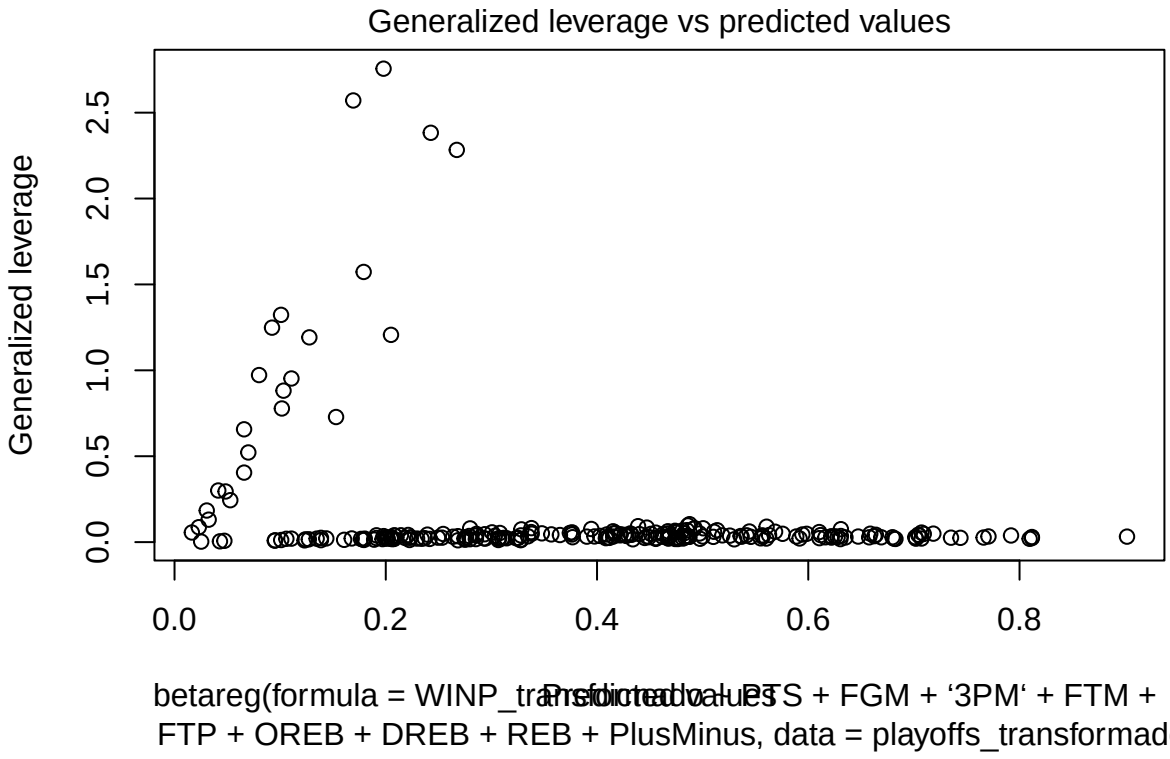
```
#### Modelo 11 ####
plot(modelo_betapt11, which = 1)
```



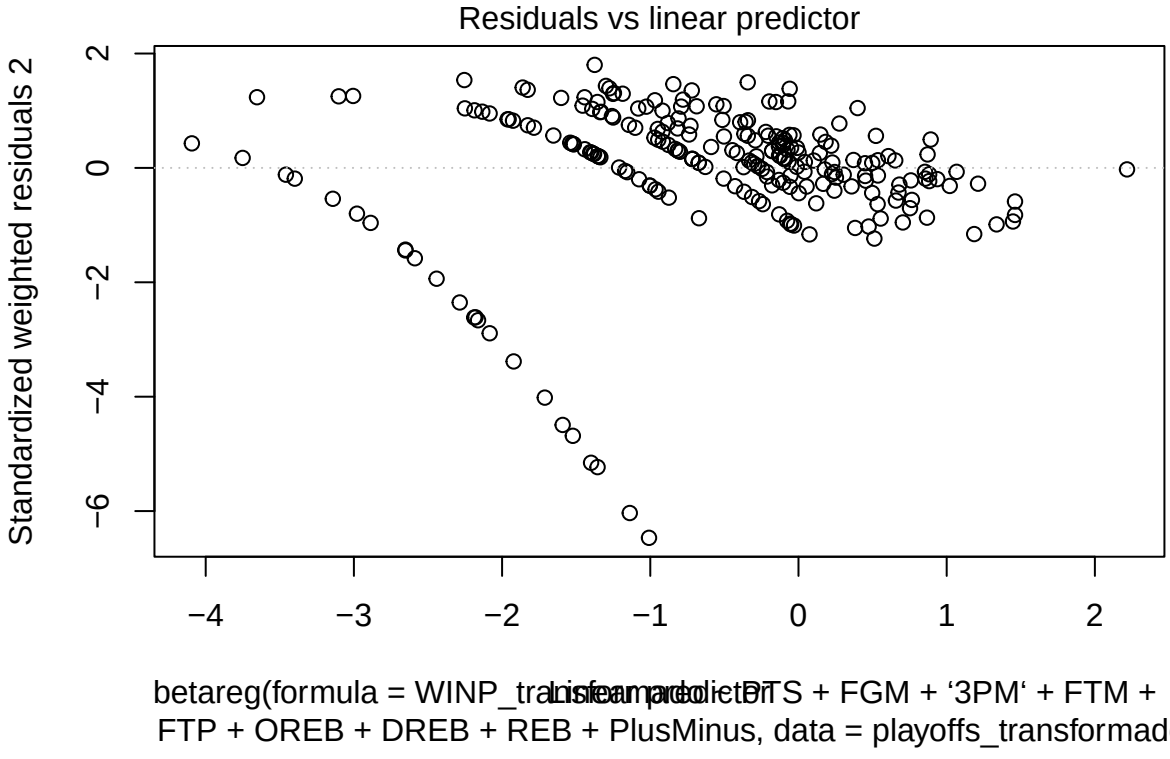

```
plot(modelo_betapt11, which = 2)
```



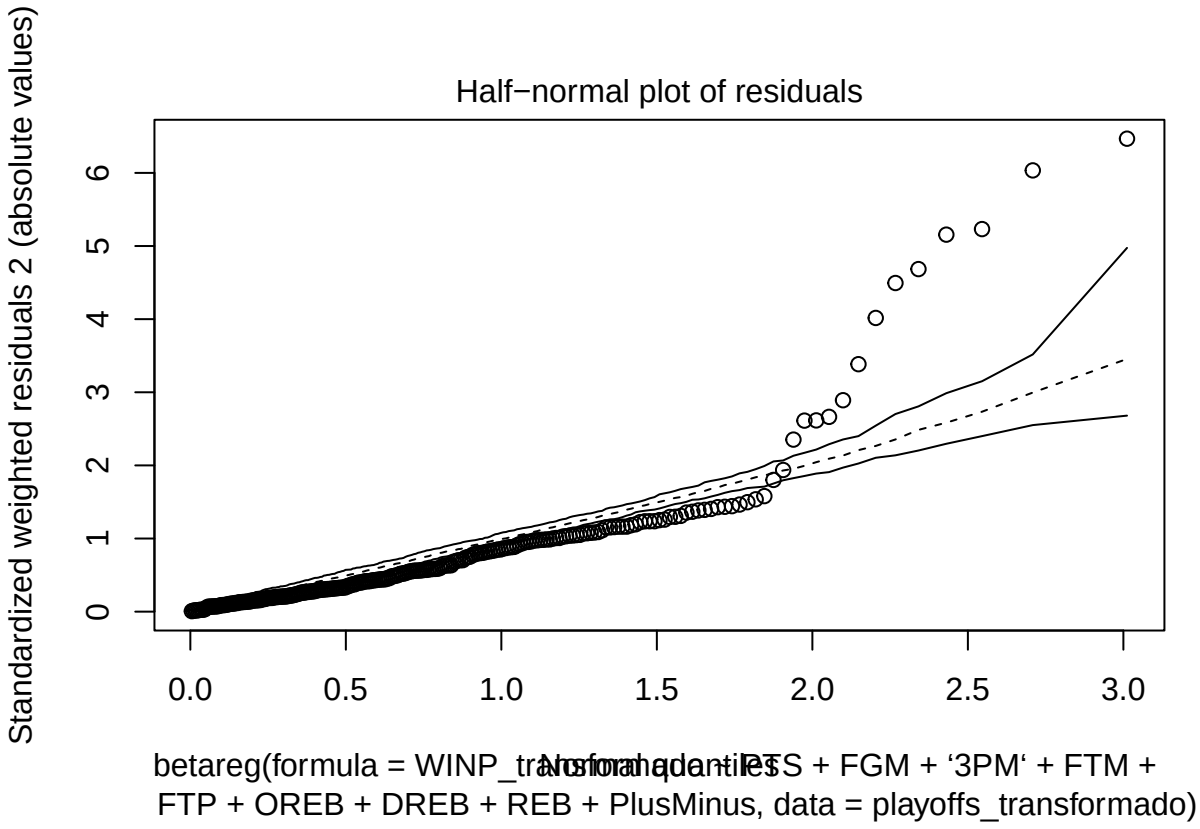

```
plot(modelo_betapt11, which = 3)
```



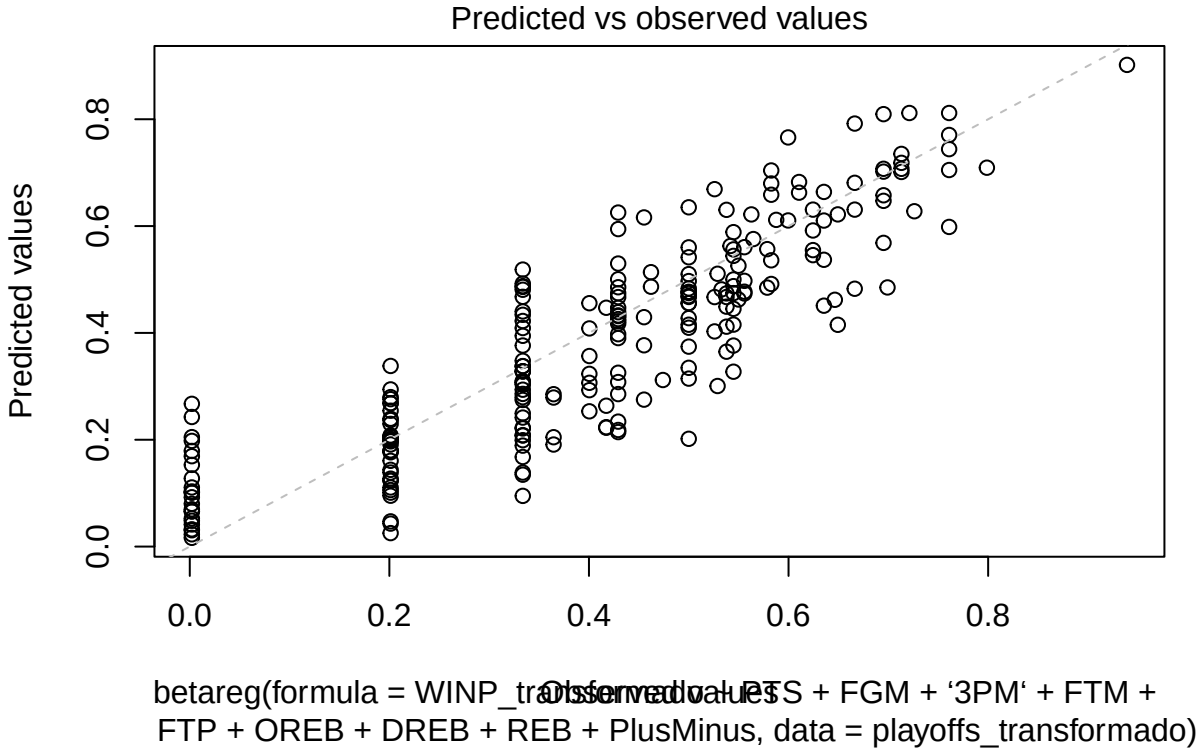

```
plot(modelo_betapt11, which = 4)
```




```
plot(modelo_betapt11, which = 5)
```




```
plot(modelo_betapt11, which = 6)
```



```r
shapiro.test(modelo_betapt11$residuals) #p-value = 0.7859, normal
```

```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_betapt11$residuals
## W = 0.99535, p-value = 0.6838
```

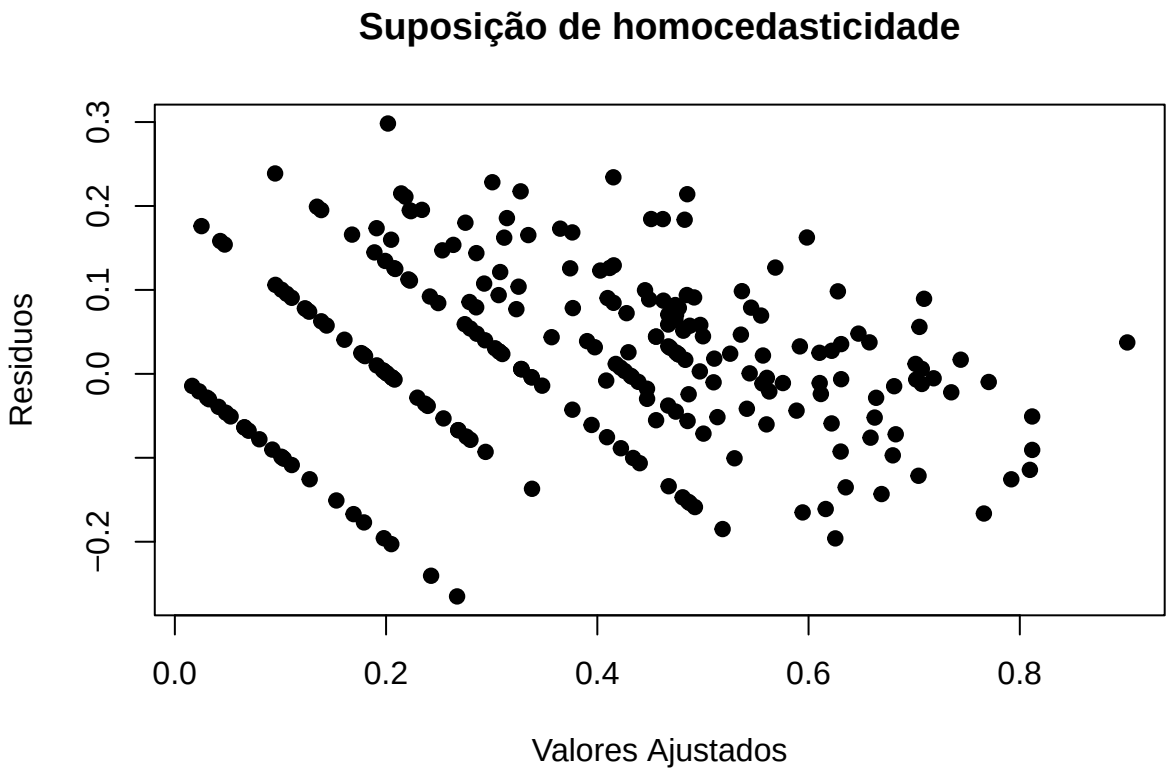
```r
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_betapt11) #p-value = 0.1243
```

```
##
##  Durbin-Watson test
##
## data:  modelo_betapt11
## DW = 1.7884, p-value = 0.04034
## alternative hypothesis: true autocorrelation is greater than 0
```

```r
#Independência
plot(modelo_betapt11$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```


```r
#Homocedasticidade
plot(modelo_betapt11$fitted.values, modelo_betapt11$residuals,
     xlab = "Valores Ajustados",
     ylab = "Residuos",
     pch = 19,
```

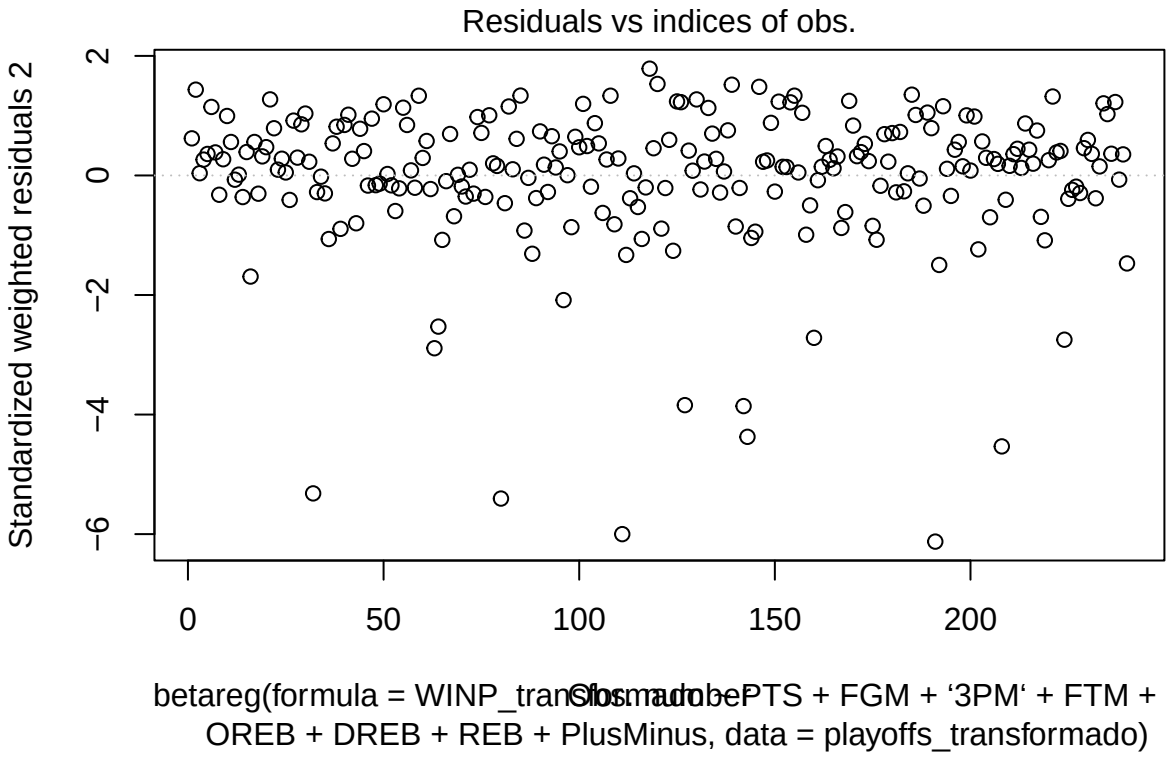
```
     main = "Suposição de homocedasticidade"
)
```



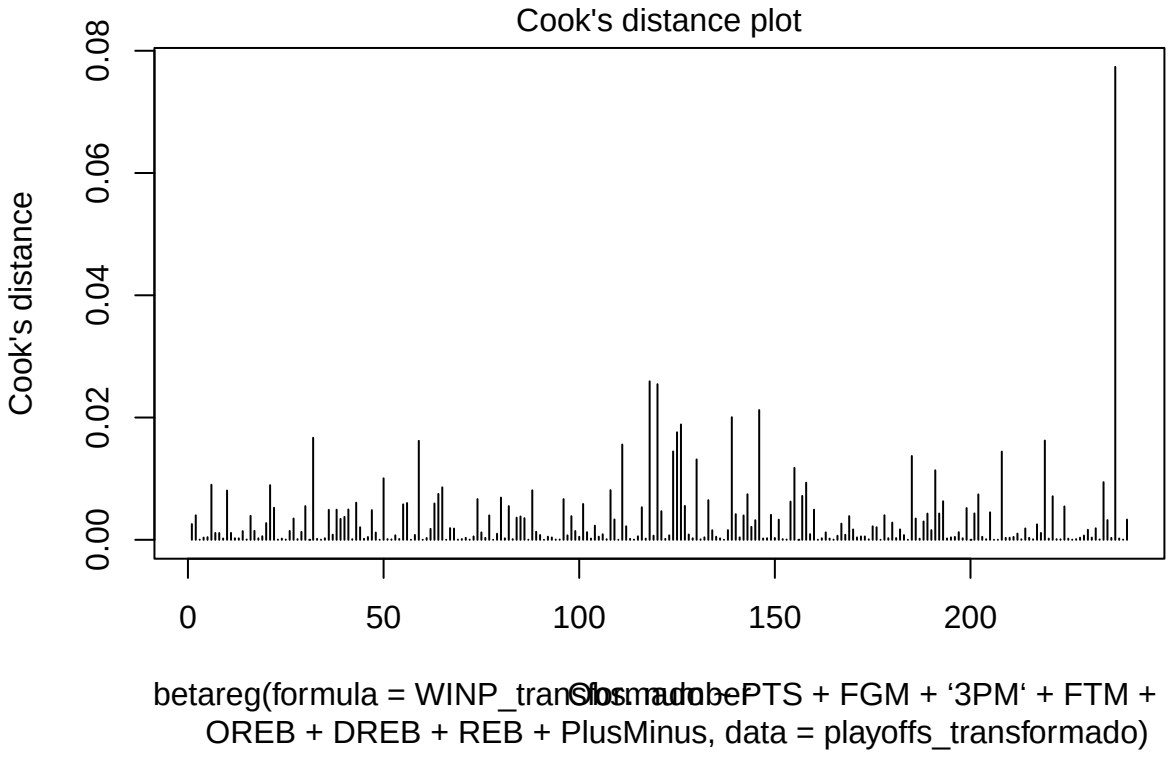

```
#Breusch_Pagan para homocedasticdade
bptest(modelo_betapt11) #p-value = 0.004251, heterocedasticidade
```

```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_betapt11
## BP = 28.755, df = 9, p-value = 0.0007128
```

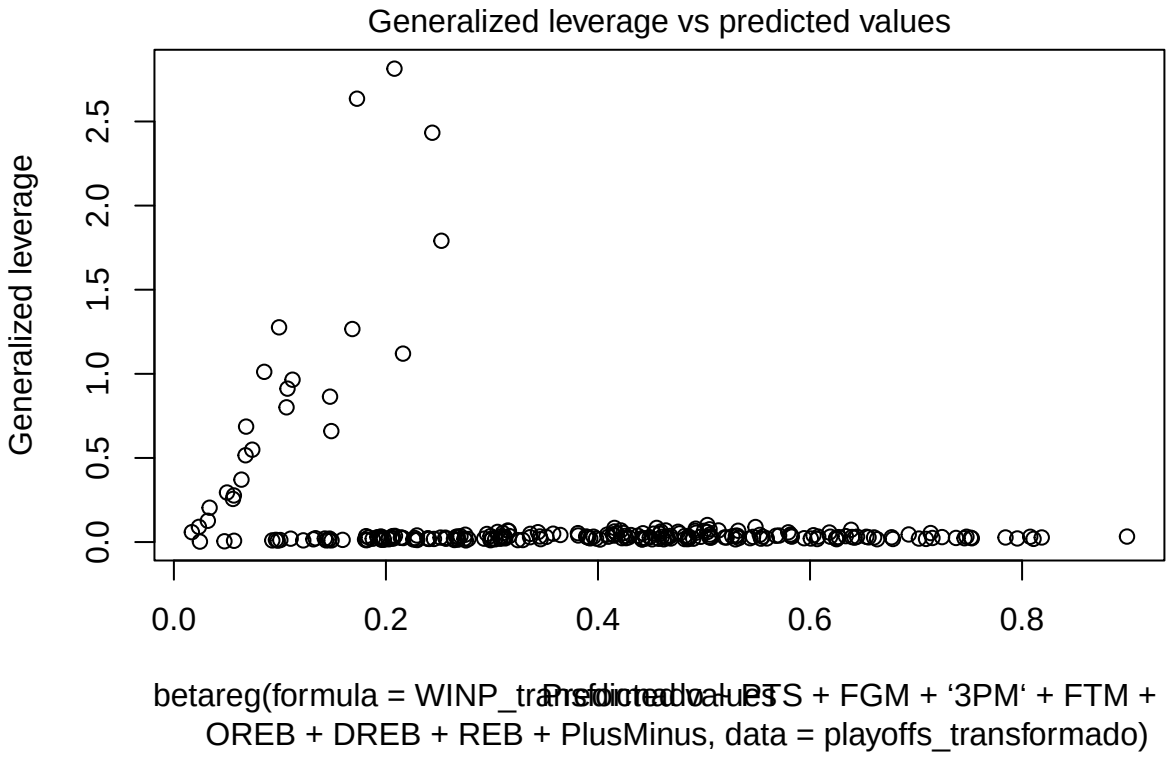
```
#Modelo 12 ####
plot(modelo_betapt12, which = 1)
```



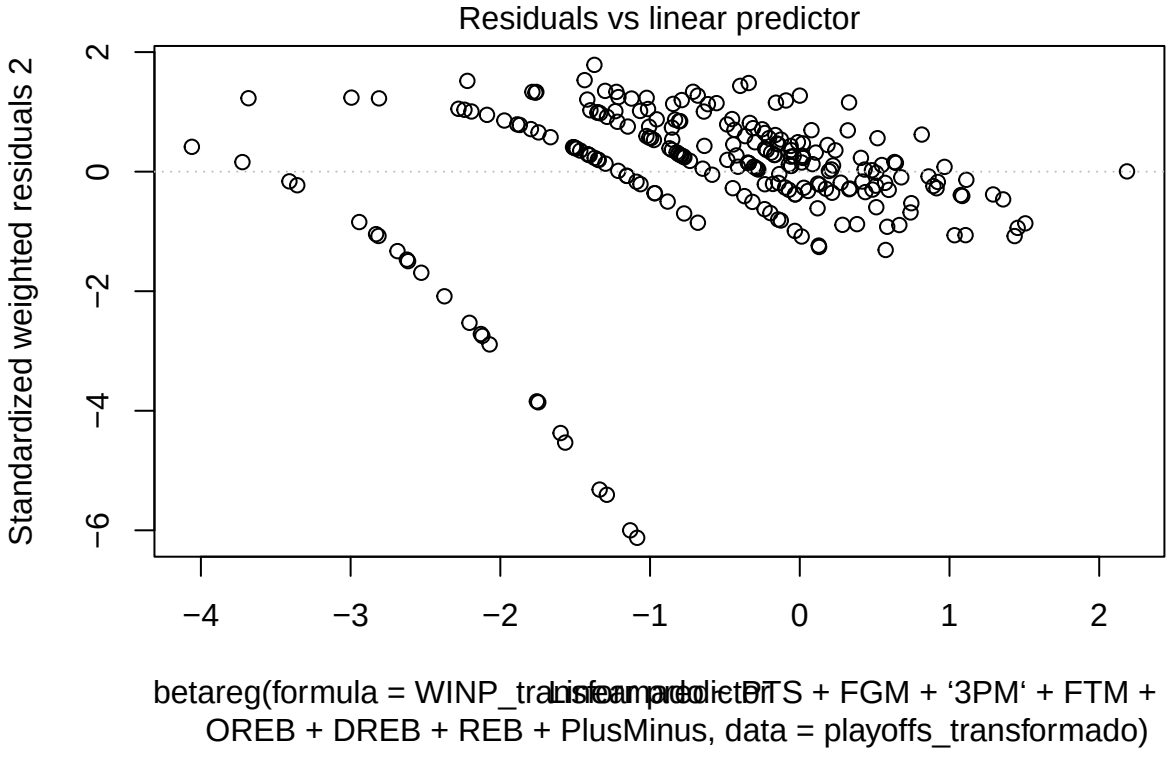

```
plot(modelo_betapt12, which = 2)
```



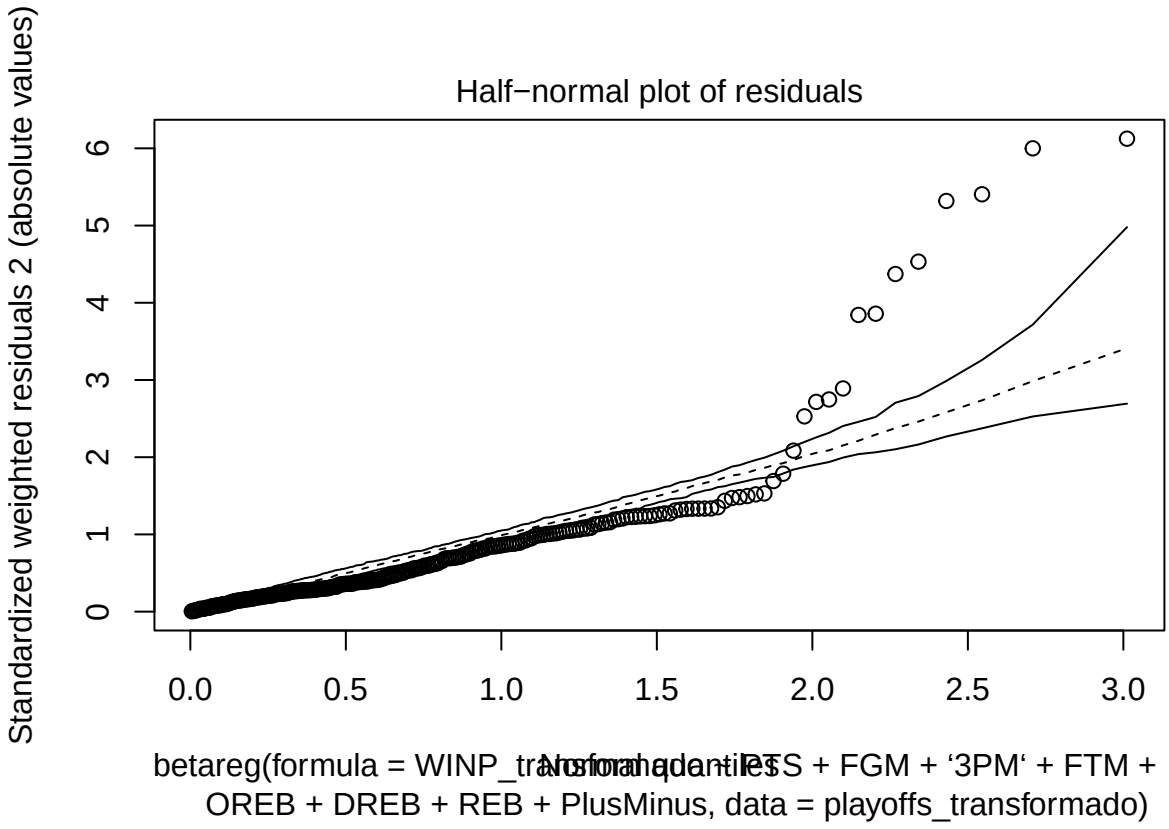

```
plot(modelo_betapt12, which = 3)
```



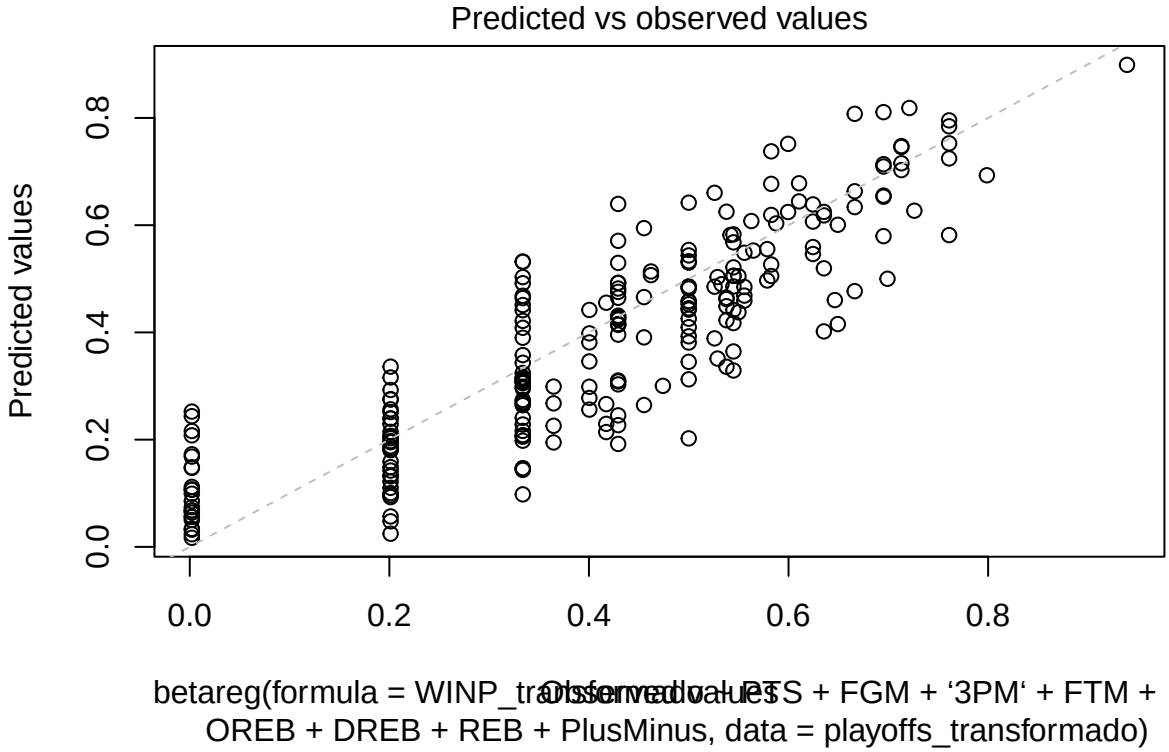

```
plot(modelo_betapt12, which = 4)
```




```
plot(modelo_betapt12, which = 5)
```




```
plot(modelo_betapt12, which = 6)
```



```r
shapiro.test(modelo_betapt12$residuals) #p-value = 0.6838, normal
```

```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_betapt12$residuals
## W = 0.99423, p-value = 0.4909
```

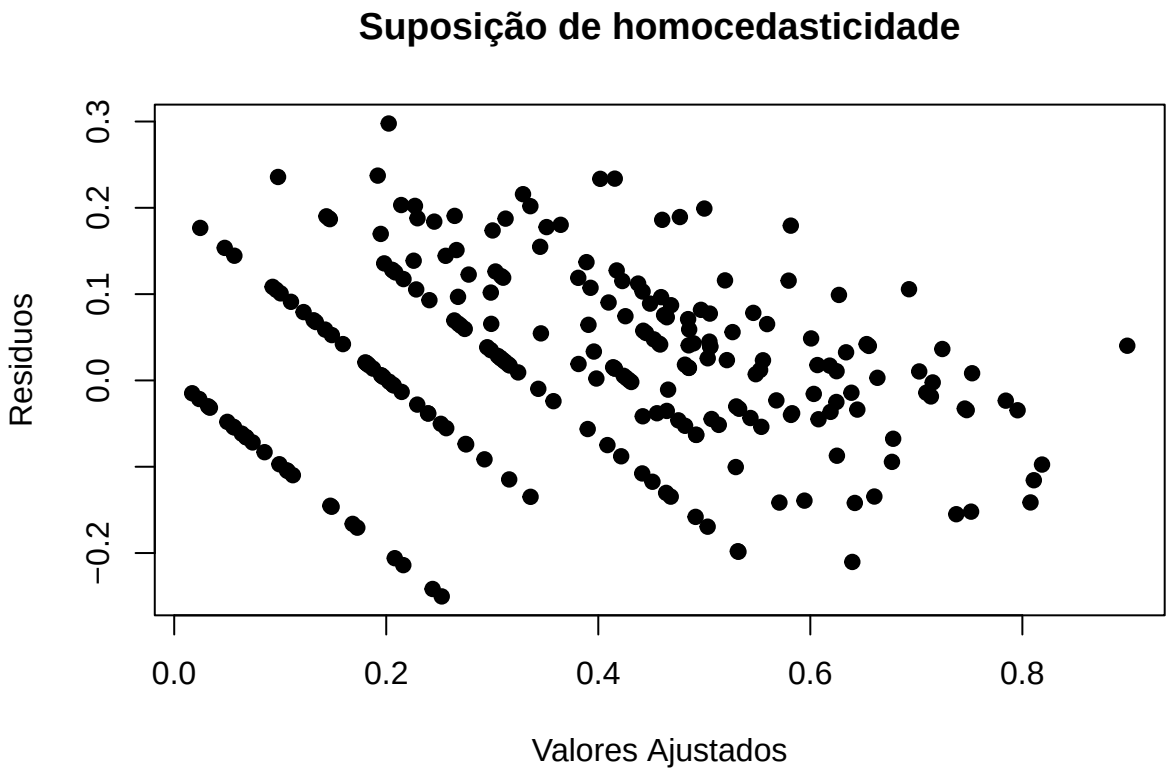
```r
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_betapt12) #p-value = 0.04034
```

```
##
##  Durbin-Watson test
##
## data:  modelo_betapt12
## DW = 1.8006, p-value = 0.04952
## alternative hypothesis: true autocorrelation is greater than 0
```

```r
#Independência
plot(modelo_betapt12$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```


```r
#Homocedasticidade
plot(modelo_betapt12$fitted.values, modelo_betapt12$residuals,
     xlab = "Valores Ajustados",
     ylab = "Residuos",
     pch = 19,
```

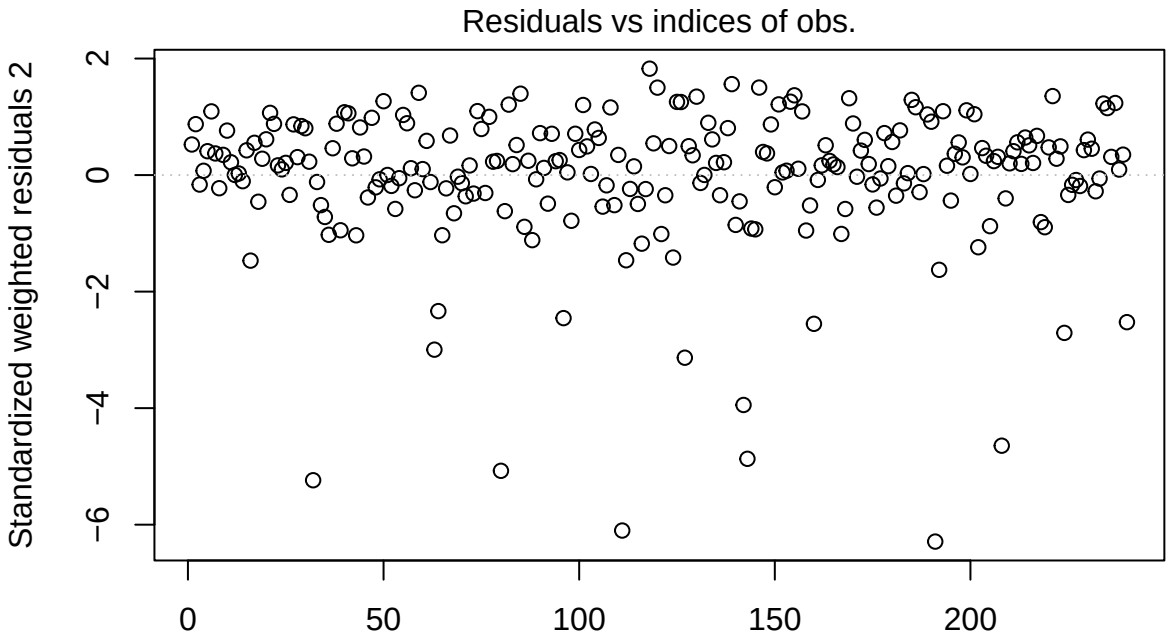
```
     main = "Suposição de homocedasticidade"
)
```




```
#Breusch_Pagan para homocedasticdade
bptest(modelo_betapt12) #p-value = 0.0007128, heterocedasticidade
```

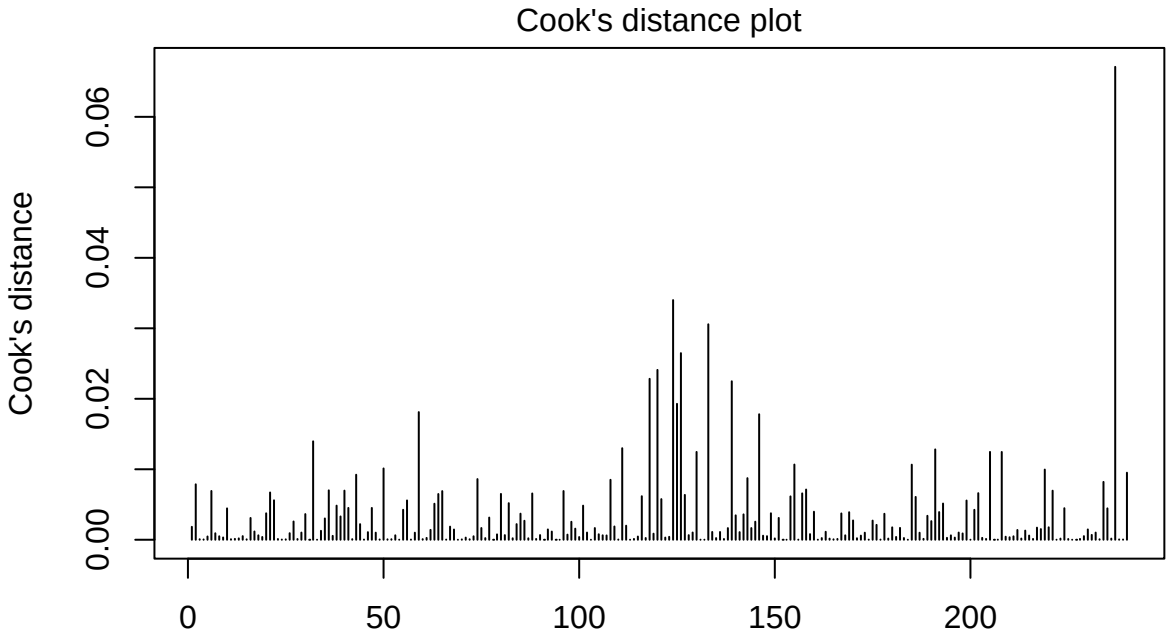
```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_betapt12
## BP = 27.098, df = 8, p-value = 0.0006799
```

```
#Modelo 13 ####
plot(modelo_betapt13, which = 1)
```



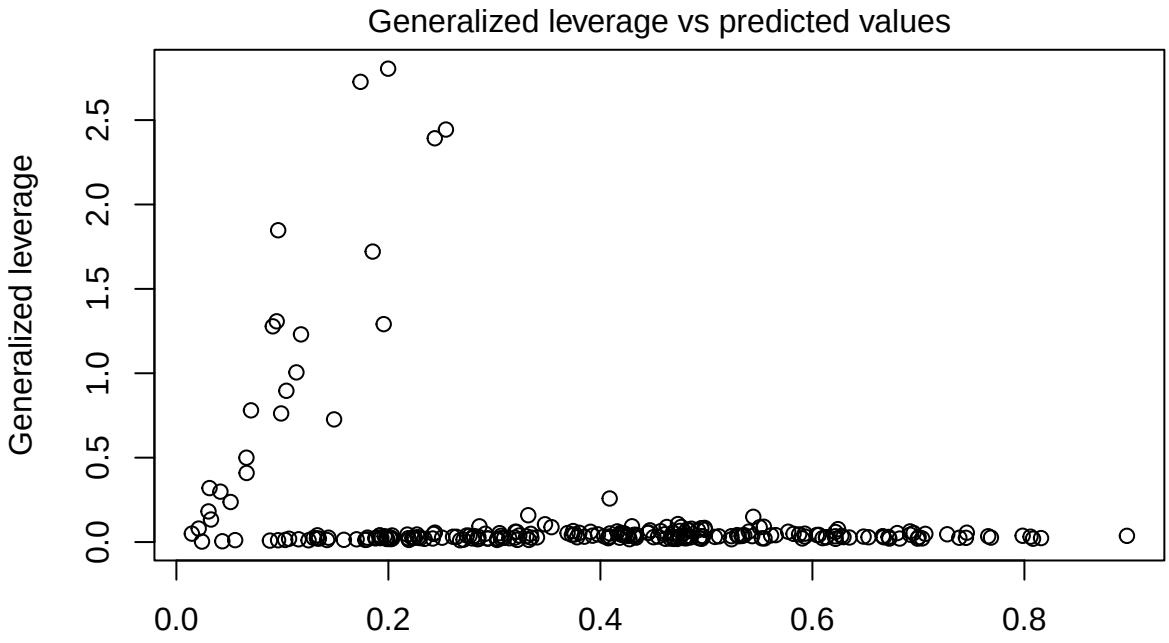
betareg(formula = WINP_transformado ~ PTS + FGM + '3PM' + FTM + FTA + FTP + OREB + DREB + REB + PlusMinus, data = playoffs_transformado)

```
plot(modelo_betapt13, which = 2)
```

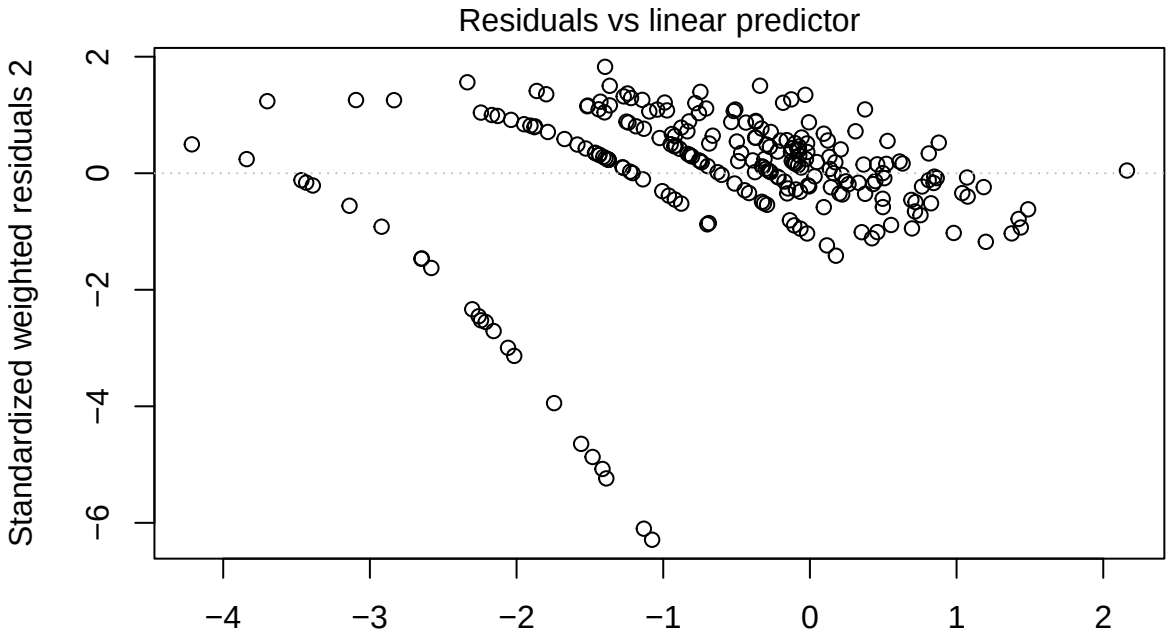


betareg(formula = WINP_transformado ~ PTS + FGM + '3PM' + FTM + FTA + FTP + OREB + DREB + REB + PlusMinus, data = playoffs_transformado)

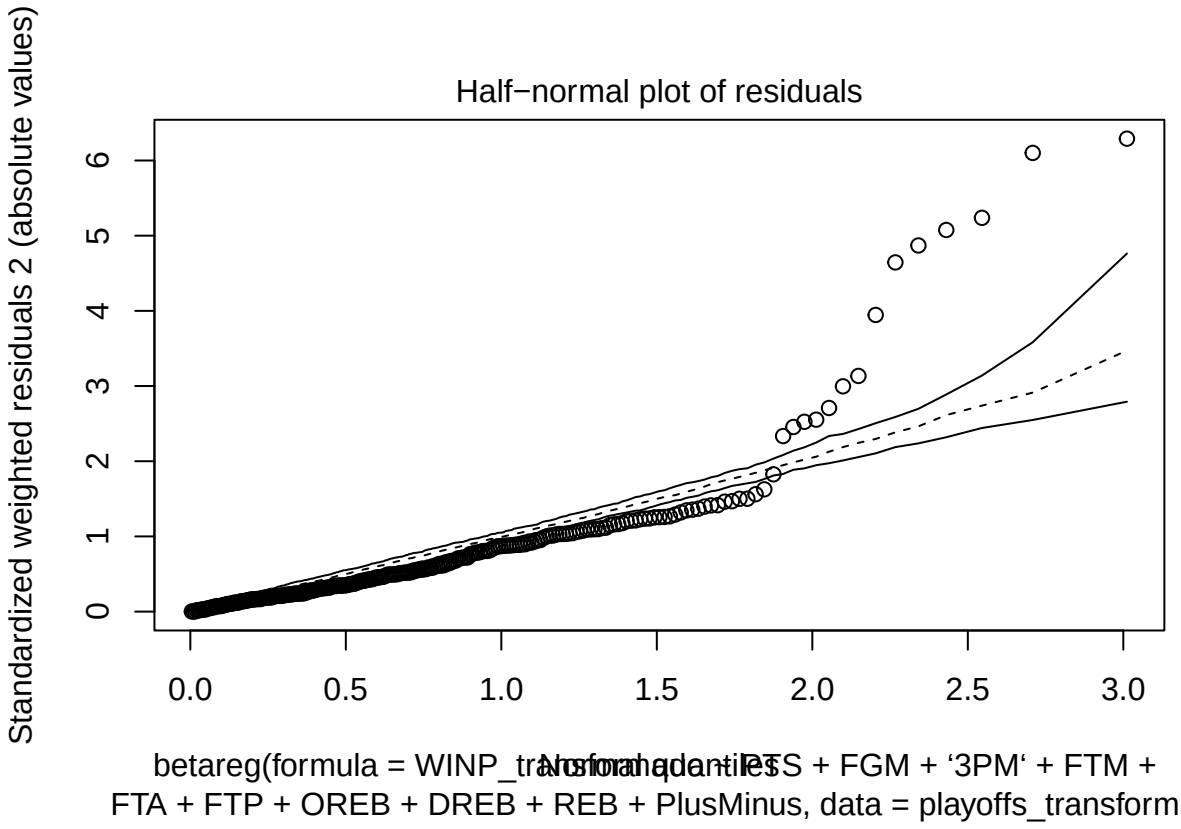
```
plot(modelo_betapt13, which = 3)
```



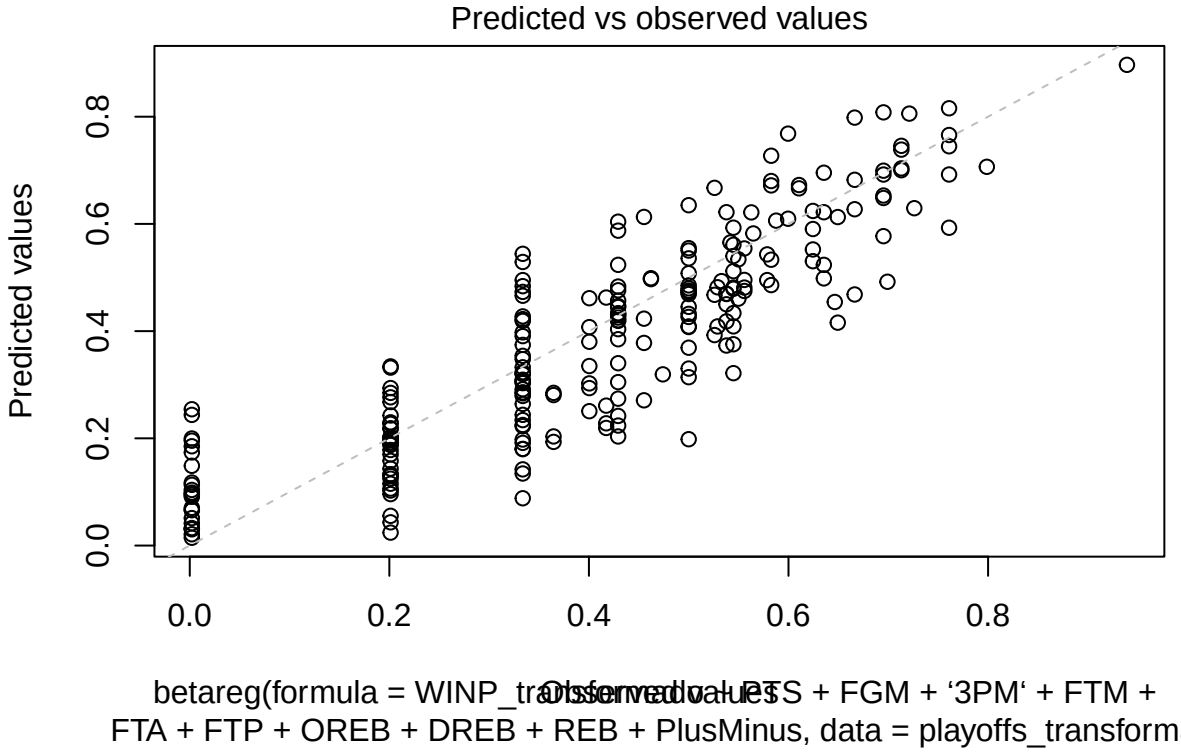

```
plot(modelo_betapt13, which = 4)
```




```
plot(modelo_betapt13, which = 5)
```




```
plot(modelo_betapt13, which = 6)
```



```r
shapiro.test(modelo_betapt13$residuals) #p-value =
```

```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_betapt13$residuals
## W = 0.99577, p-value = 0.7581
```

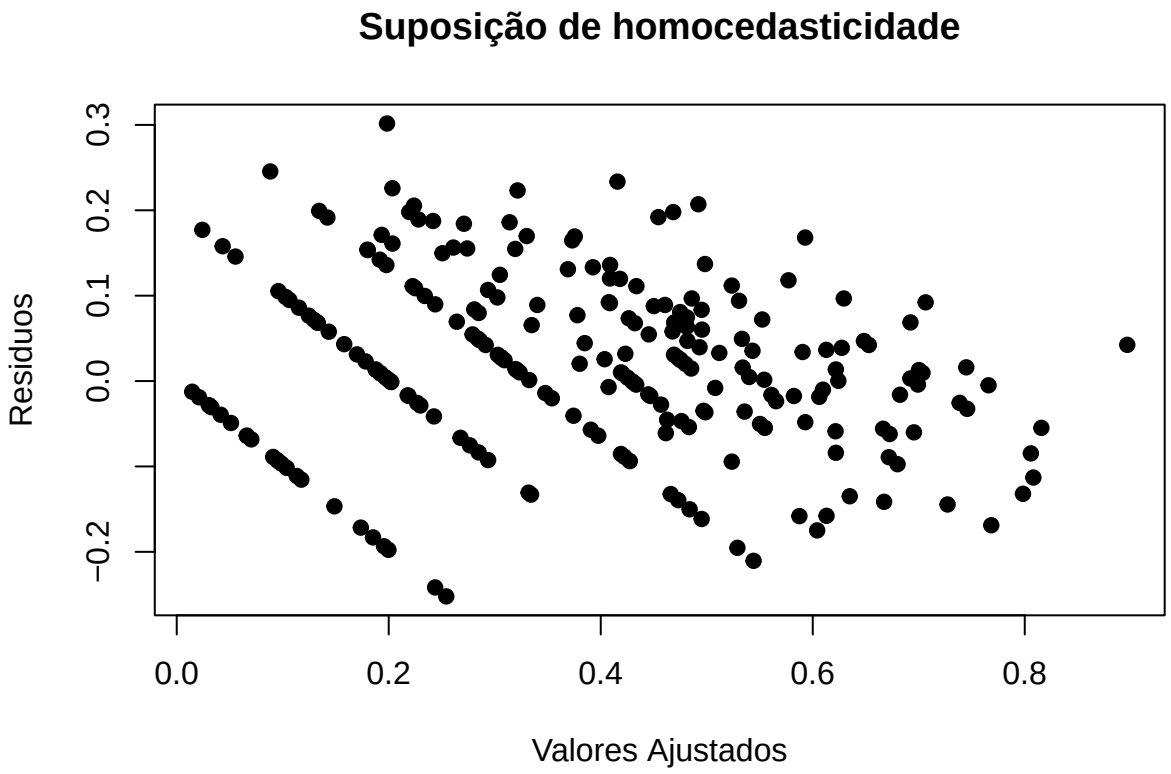
```r
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_betapt13) #p-value = 0.04034
```

```
##
##  Durbin-Watson test
##
## data:  modelo_betapt13
## DW = 1.7876, p-value = 0.03917
## alternative hypothesis: true autocorrelation is greater than 0
```

```r
#Independência
plot(modelo_betapt13$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```


```r
#Homocedasticidade
plot(modelo_betapt13$fitted.values, modelo_betapt13$residuals,
     xlab = "Valores Ajustados",
     ylab = "Residuos",
     pch = 19,
```

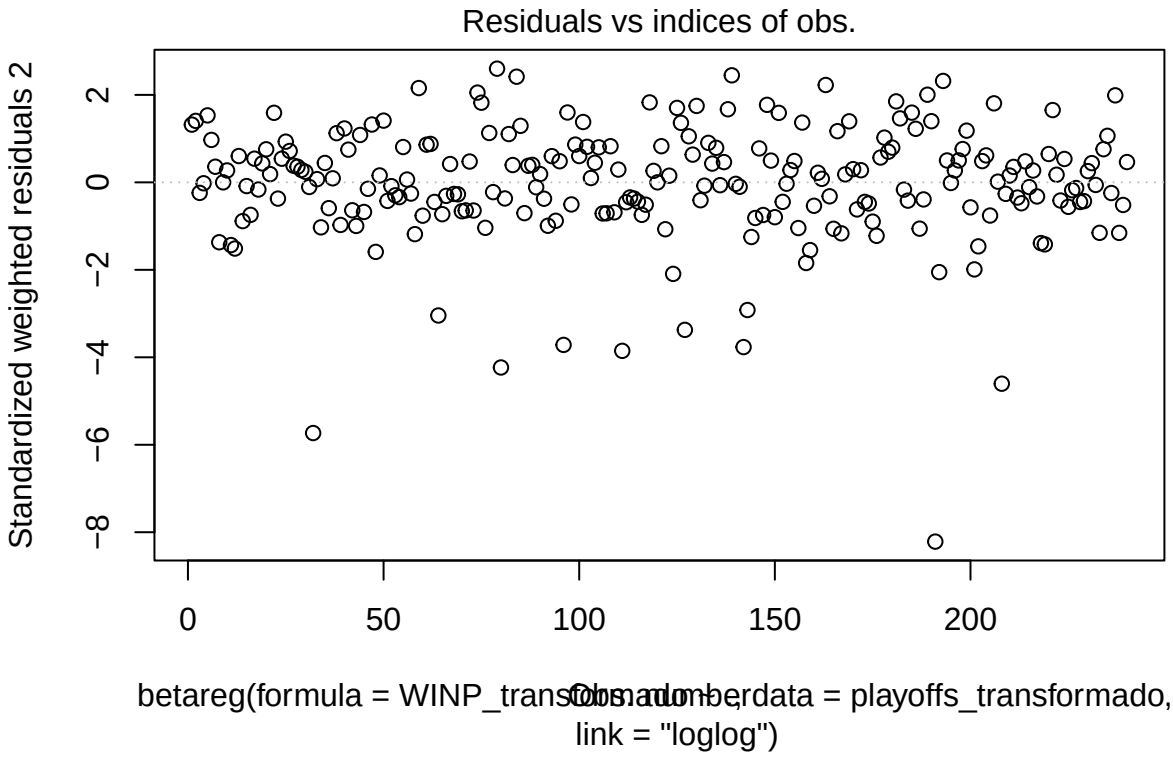
```
     main = "Suposição de homocedasticidade"
)
```



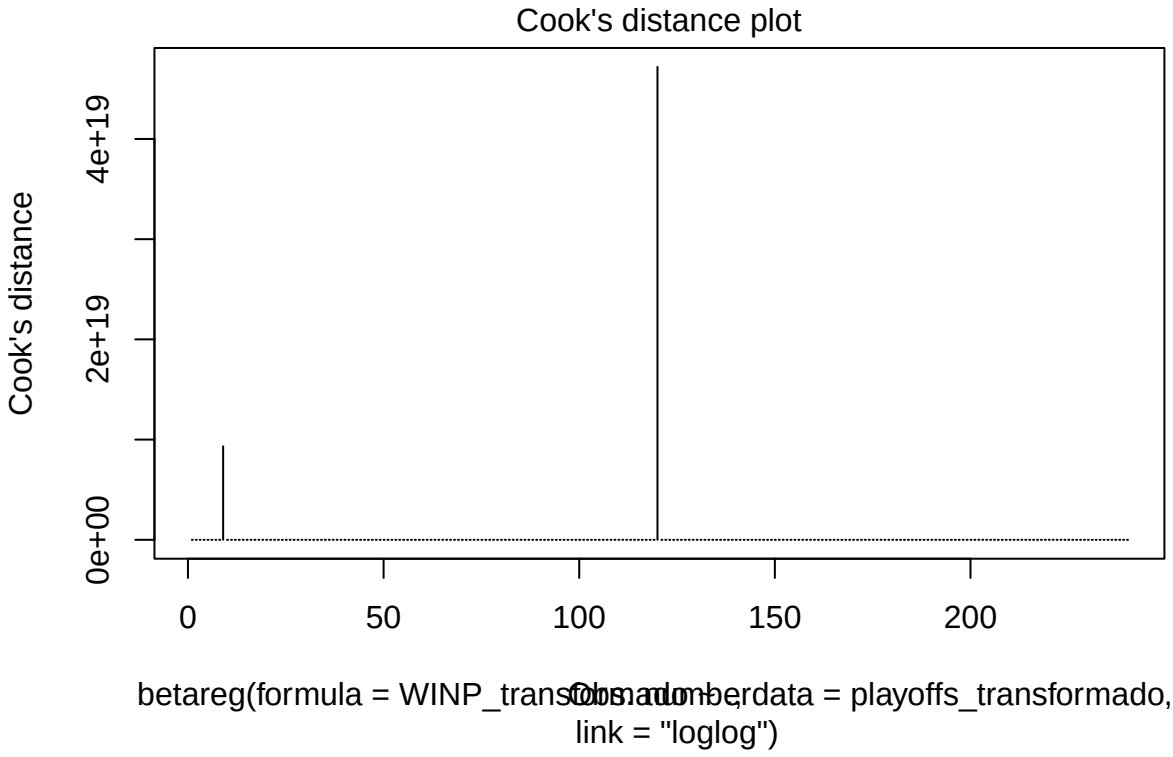

```
#Breusch_Pagan para homocedasticdade
bptest(modelo_betapt13) #p-value = 0.0007128, heterocedasticidade
```

```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_betapt13
## BP = 28.674, df = 10, p-value = 0.001407
```

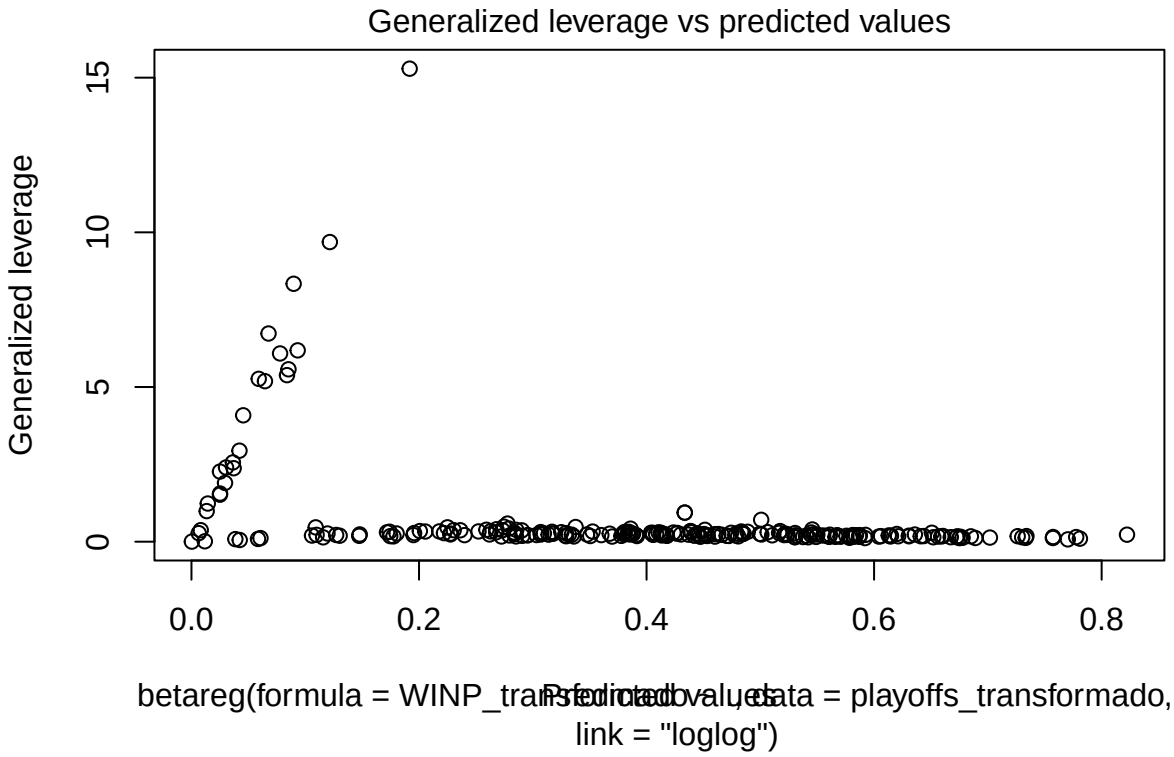
```
############ loglog #########
####### Modelo completo ####
plot(modelo_betat_loglog, which = 1)
```



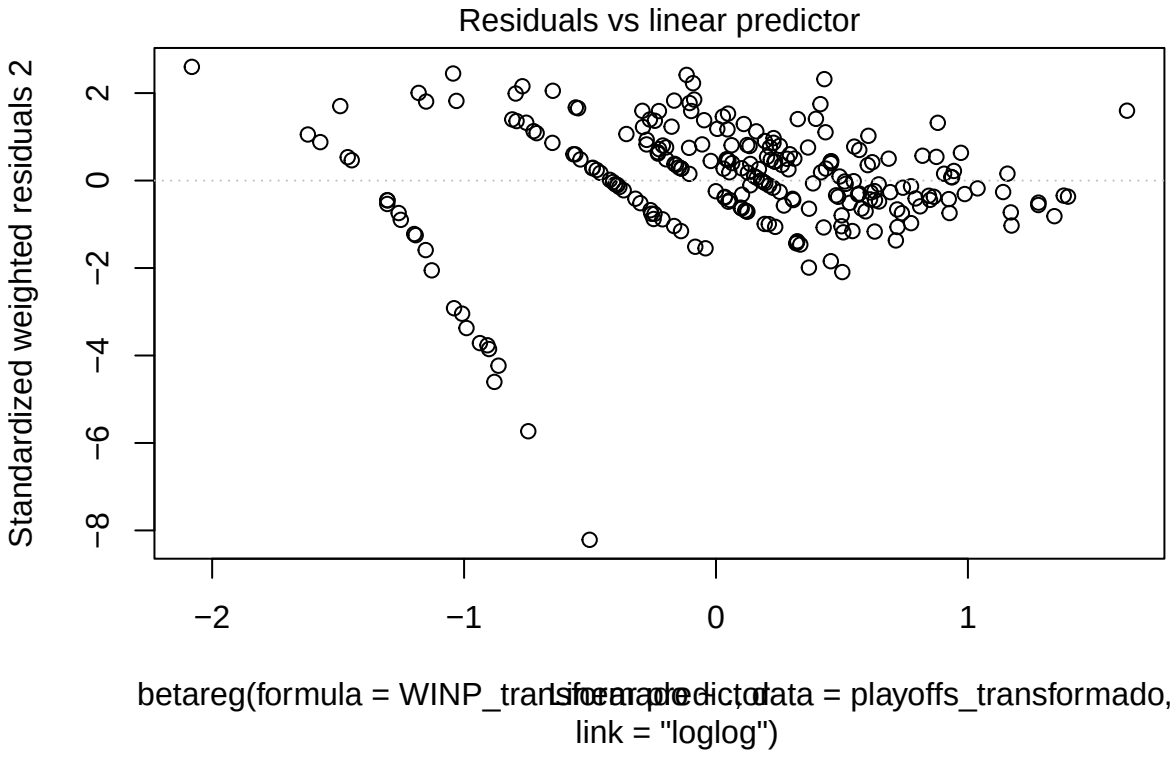

```
plot(modelo_betat_loglog, which = 2)
```



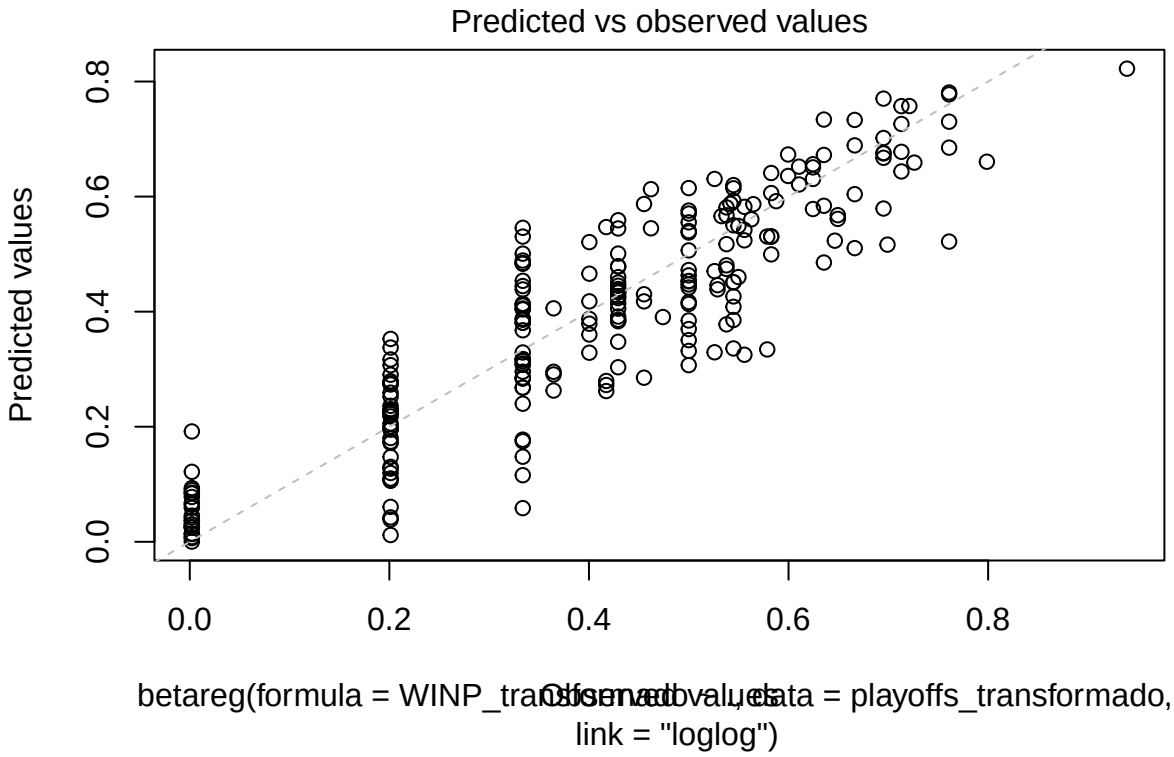

```
plot(modelo_betat_loglog, which = 3)
```




```
plot(modelo_betat_loglog, which = 4)
```




```
plot(modelo_betat_loglog, which = 6)
```




```r
shapiro.test(modelo_betat_loglog$residuals) #p-value =
```

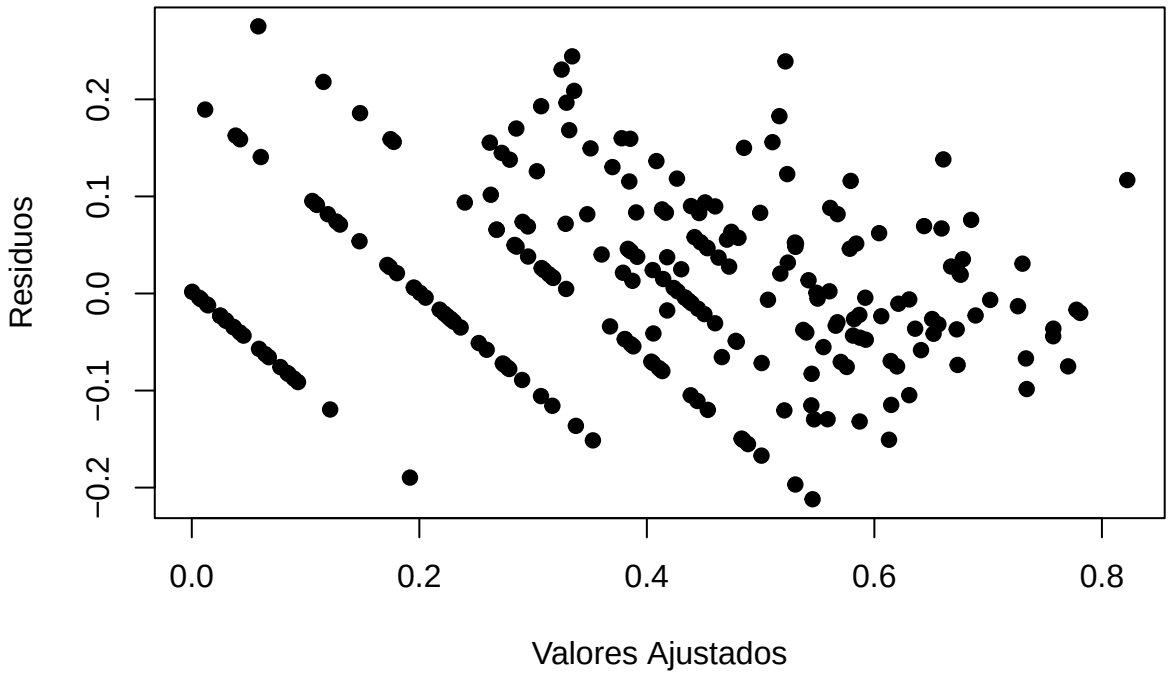
```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_betat_loglog$residuals
## W = 0.98891, p-value = 0.06193
```

```r
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_betat_loglog) #p-value = 0.04034
```

```
##
##  Durbin-Watson test
##
## data:  modelo_betat_loglog
## DW = 1.9021, p-value = 0.04183
## alternative hypothesis: true autocorrelation is greater than 0
```

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

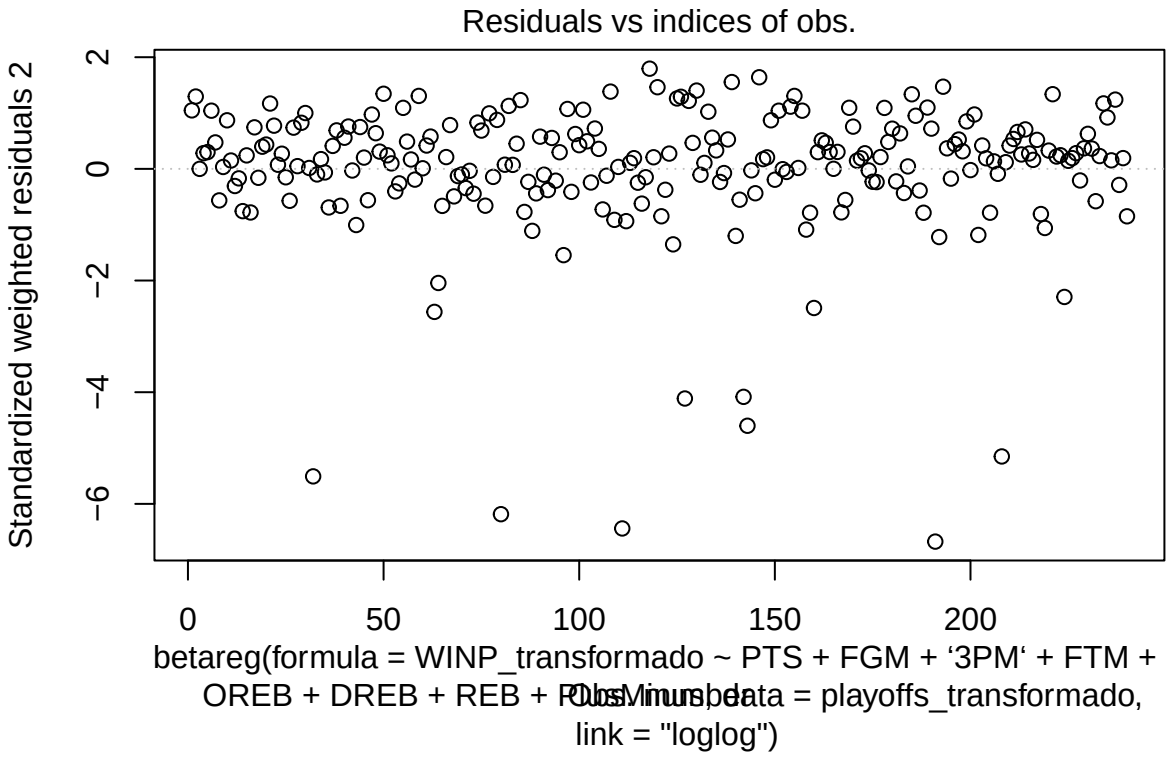

```
#Homocedasticidade
plot(modelo_betat_loglog$fitted.values, modelo_betat_loglog$residuals,
     xlab = "Valores Ajustados",
     ylab = "Residuos",
     pch = 19,
     main = "Suposição de homocedasticidade"
)
```



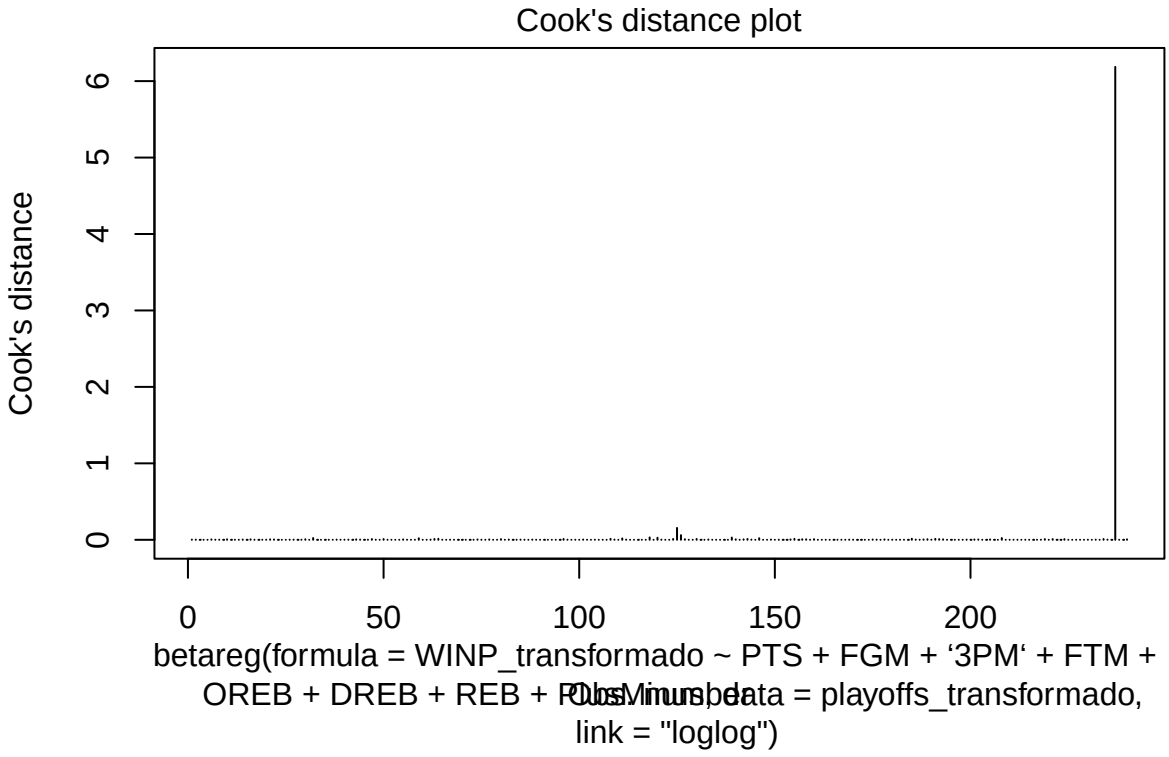

```
#Breusch_Pagan para homocedasticdade
bptest(modelo_betat_loglog) #p-value = 0.0007128, heterocedasticidade
```

```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_betat_loglog
## BP = 88.168, df = 67, p-value = 0.04258
```

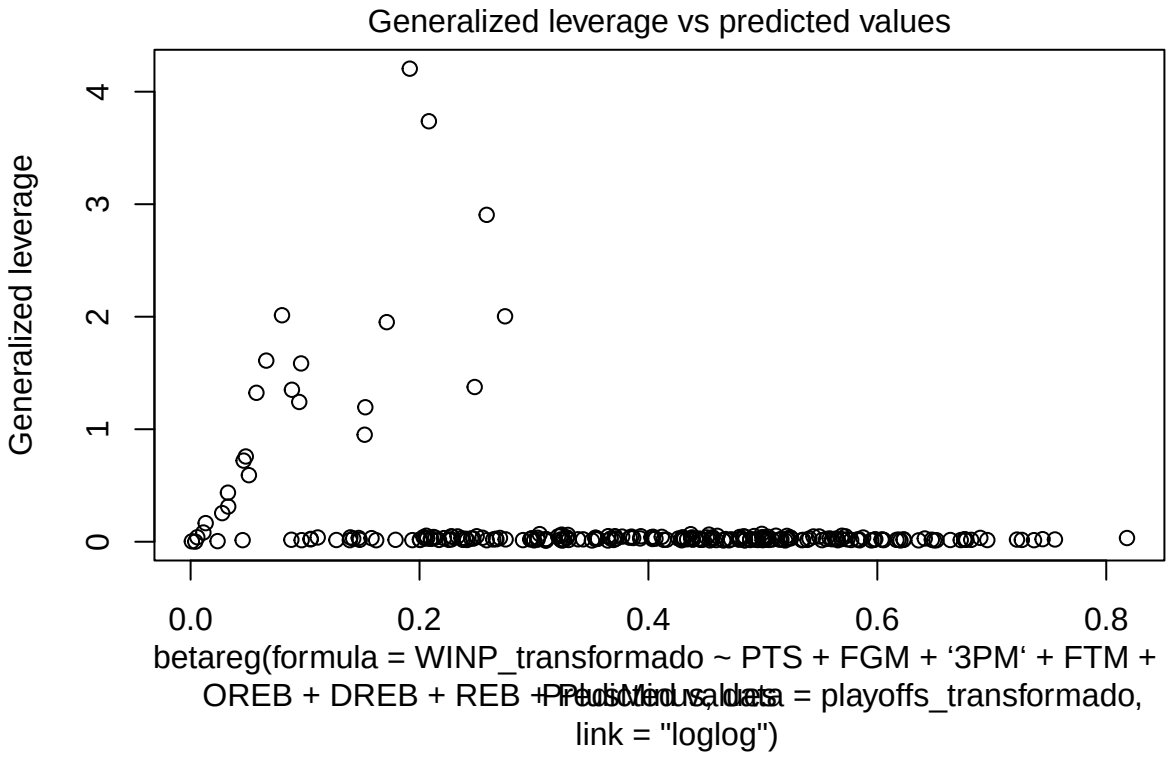
```
####### Modelo 5% ####
plot(modelo_betat_loglog1, which = 1)
```



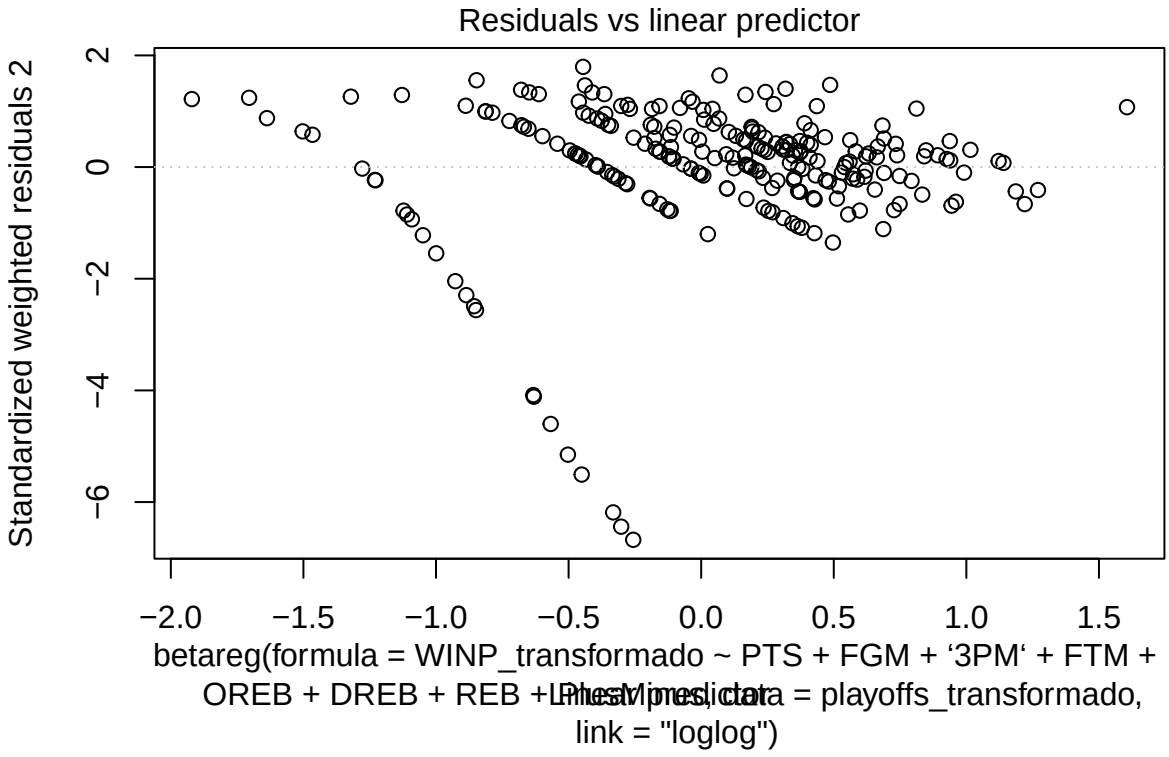

```
plot(modelo_betat_loglog1, which = 2)
```



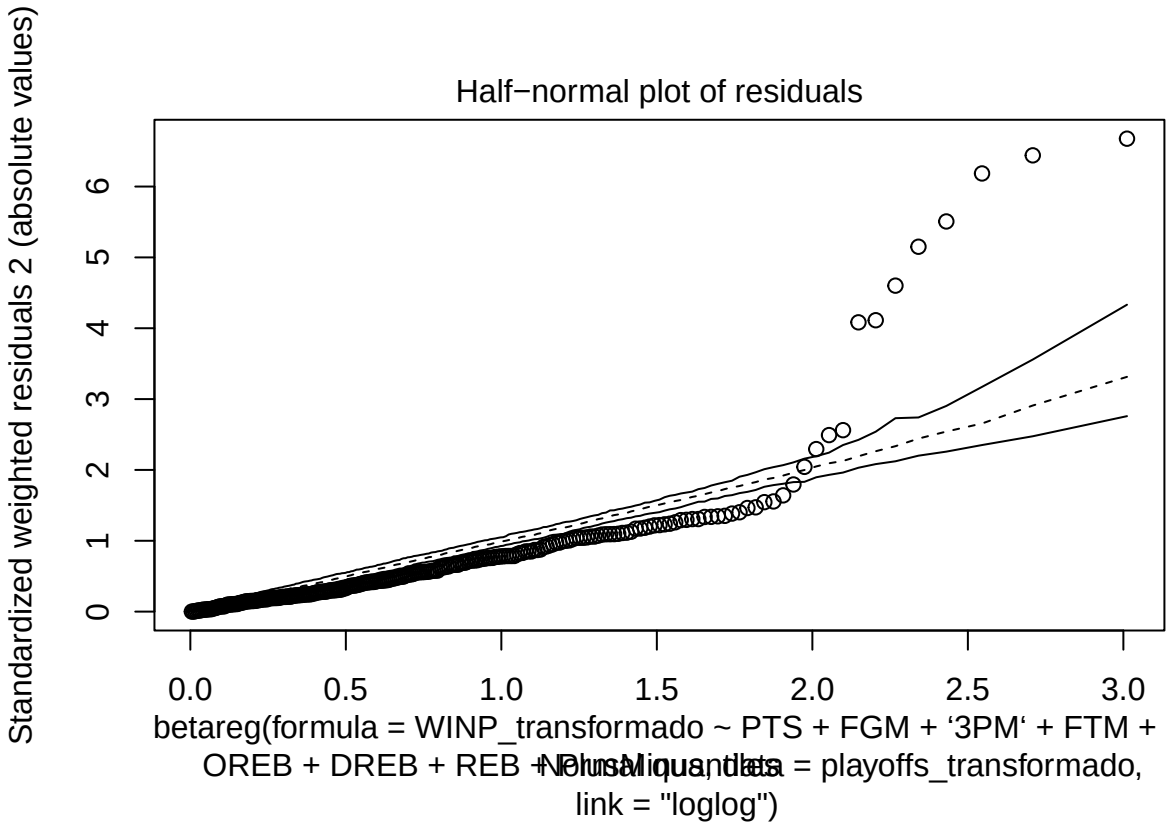

```
plot(modelo_betat_loglog1, which = 3)
```



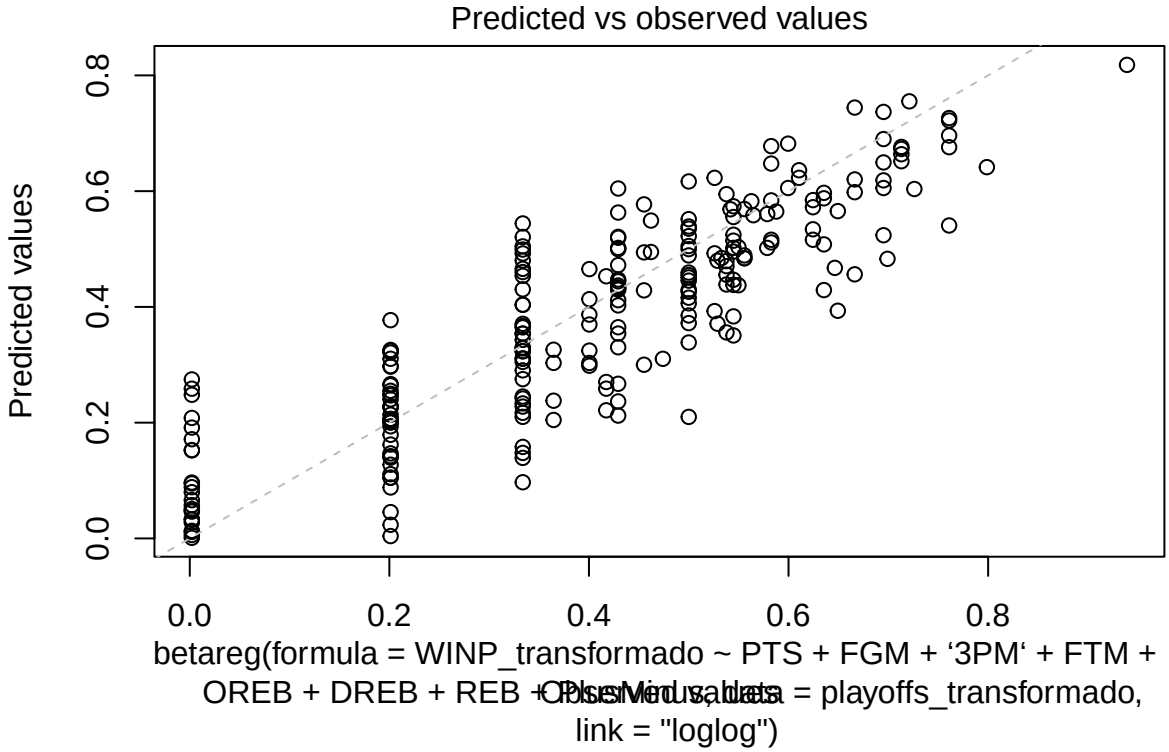

```
plot(modelo_betat_loglog1, which = 4)
```




```
plot(modelo_betat_loglog1, which = 5)
```




```
plot(modelo_betat_loglog1, which = 6)
```



```r
shapiro.test(modelo_betat_loglog1$residuals) #p-value =
```

```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_betat_loglog1$residuals
## W = 0.9958, p-value = 0.7629
```

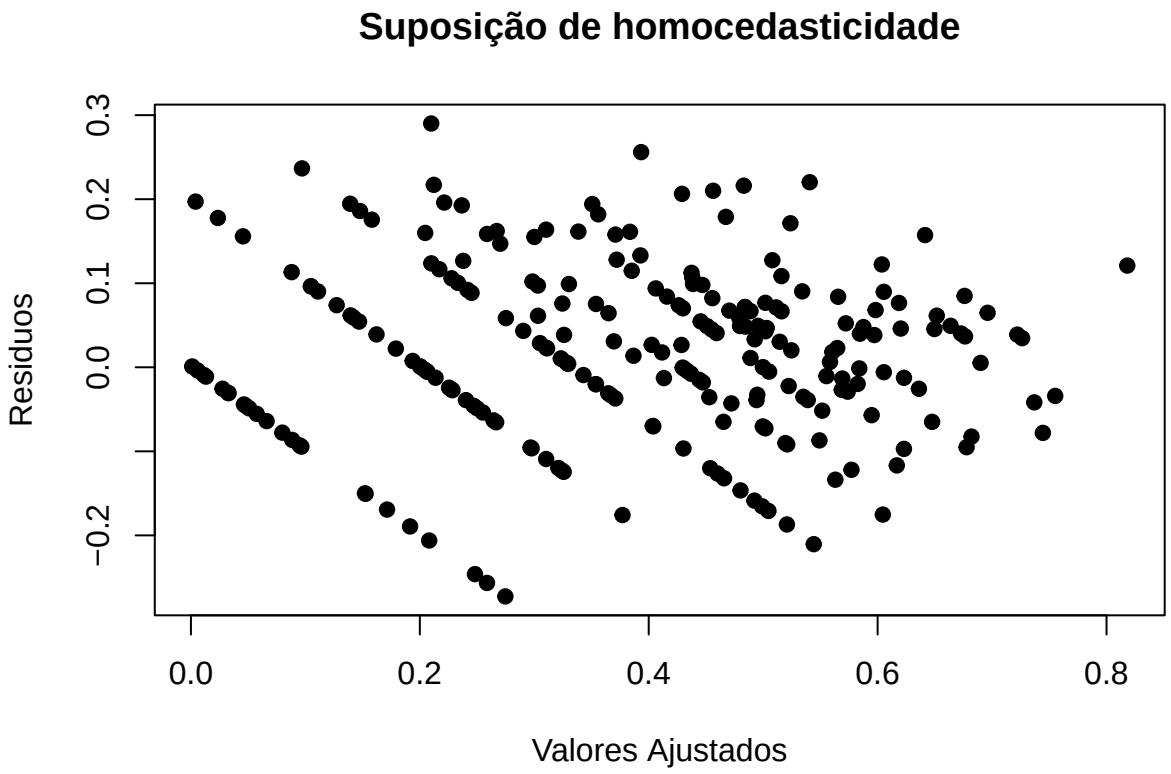
```r
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_betat_loglog1) #p-value = 0.04034
```

```
##
##  Durbin-Watson test
##
## data:  modelo_betat_loglog1
## DW = 1.8006, p-value = 0.04952
## alternative hypothesis: true autocorrelation is greater than 0
```

```r
#Independência
plot(modelo_betat_loglog1$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```


```r
#Homocedasticidade
plot(modelo_betat_loglog1$fitted.values, modelo_betat_loglog1$residuals,
     xlab = "Valores Ajustados",
     ylab = "Residuos",
     pch = 19,
```

```
     main = "Suposição de homocedasticidade"
)
```




```
#Breusch_Pagan para homocedasticdade
bptest(modelo_betat_loglog1) #p-value = 0.0007128, heterocedasticidade######### Probito ########
```

```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_betat_loglog1
## BP = 27.098, df = 8, p-value = 0.0006799
```

```
####### Modelo completo ####
shapiro.test(modelo_betat_probit$residuals) #p-value =
```

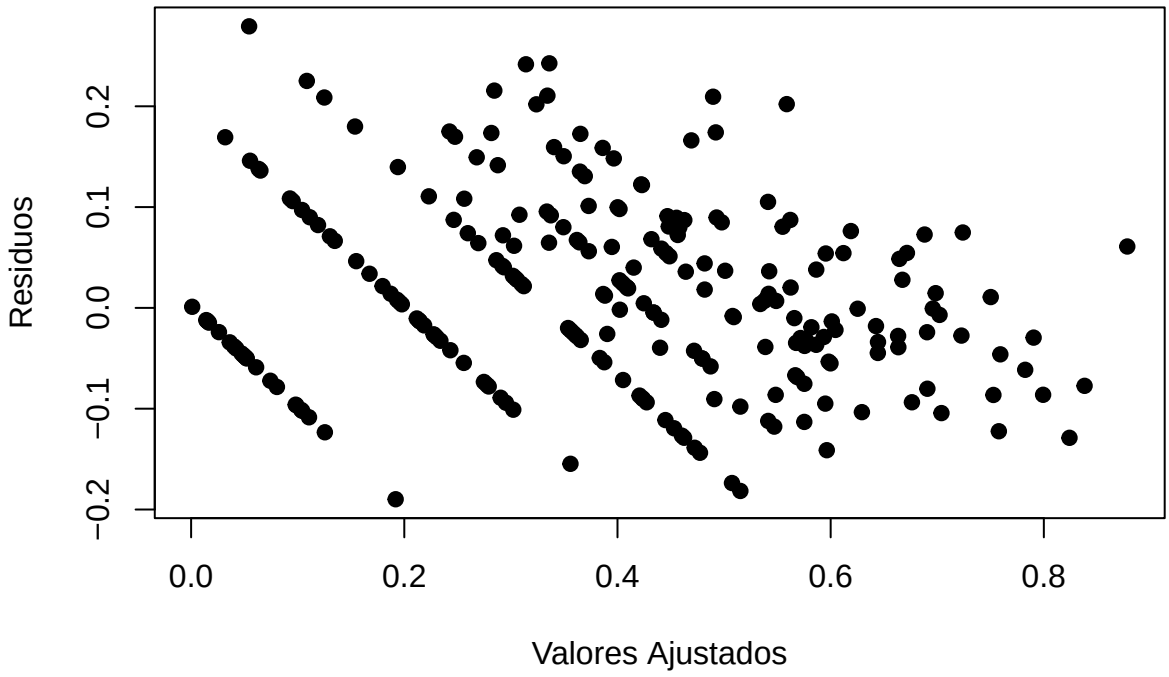
```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_betat_probit$residuals
## W = 0.98399, p-value = 0.008387
```

```
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_betat_probit) #p-value = 0.04034
```

```
##
##  Durbin-Watson test
##
## data:  modelo_betat_probit
## DW = 1.9021, p-value = 0.04183
## alternative hypothesis: true autocorrelation is greater than 0
```

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

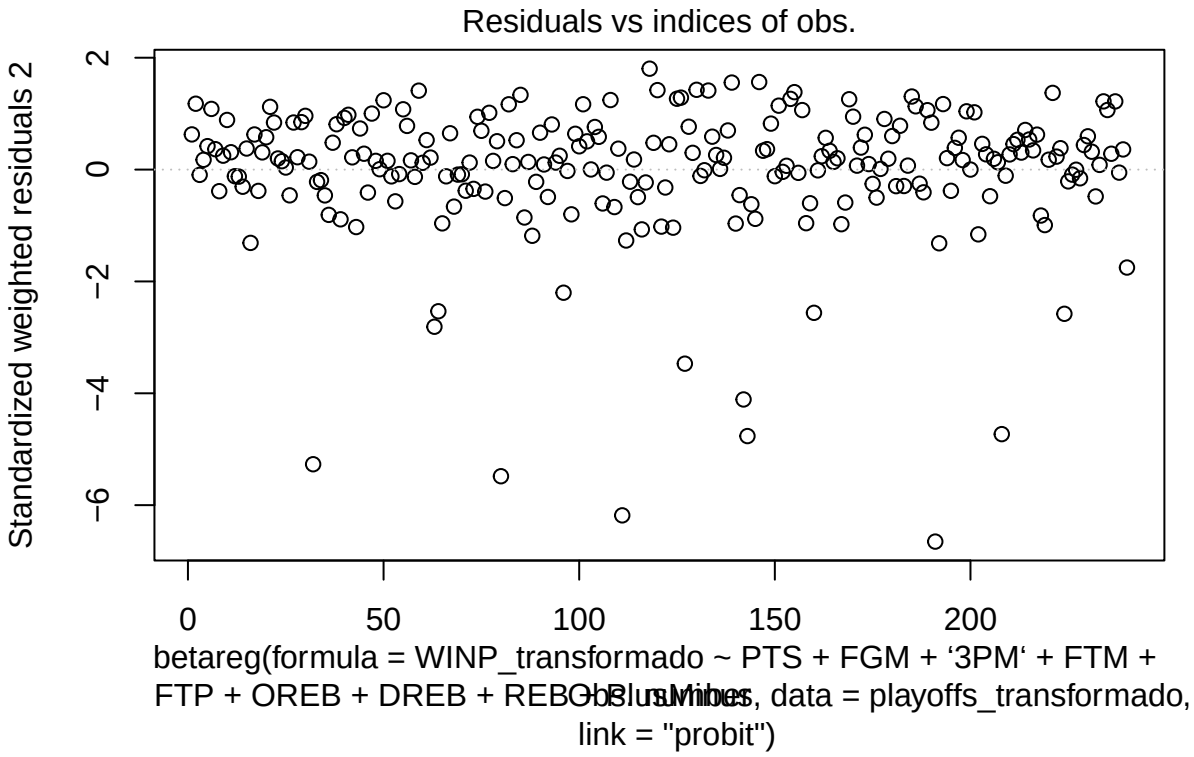

```r
#Homocedasticidade
plot(modelo_betat_probit$fitted.values, modelo_betat_probit$residuals,
     xlab = "Valores Ajustados",
     ylab = "Residuos",
     pch = 19,
     main = "Suposição de homocedasticidade"
)
```



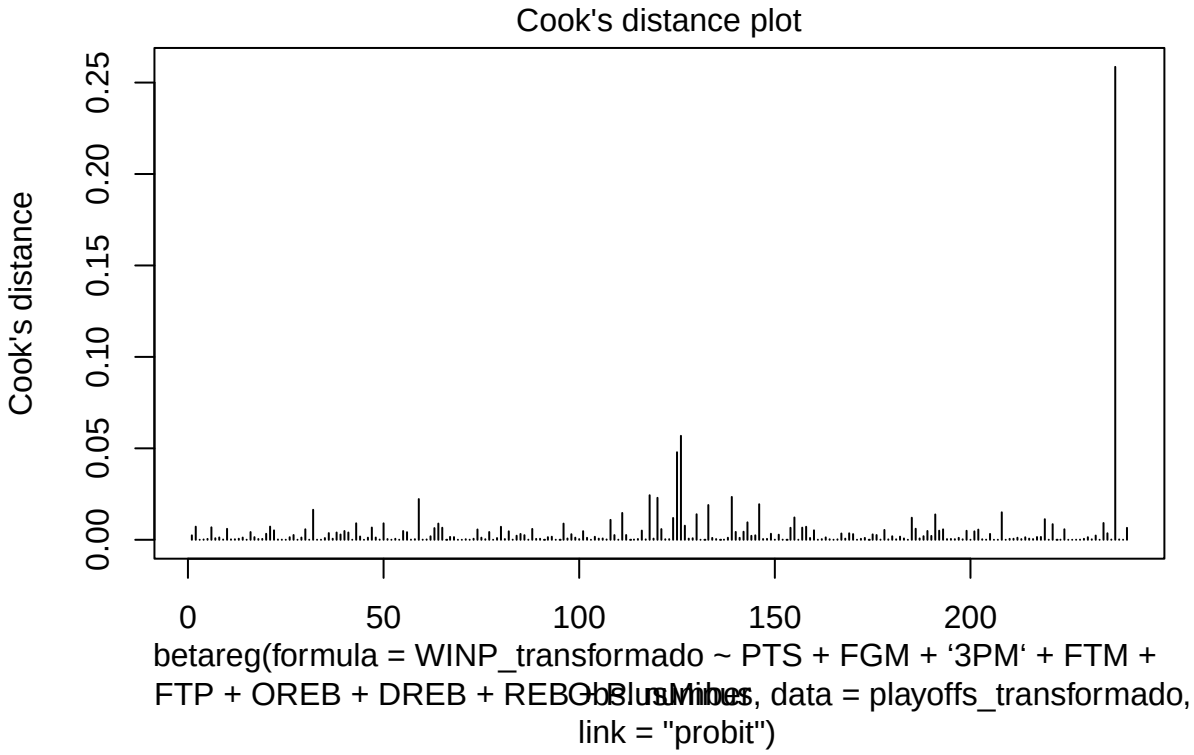

```
#Breusch_Pagan para homocedasticdade
bptest(modelo_betat_probit) #p-value = 0.0007128, heterocedasticidade
```

```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_betat_probit
## BP = 88.168, df = 67, p-value = 0.04258
```

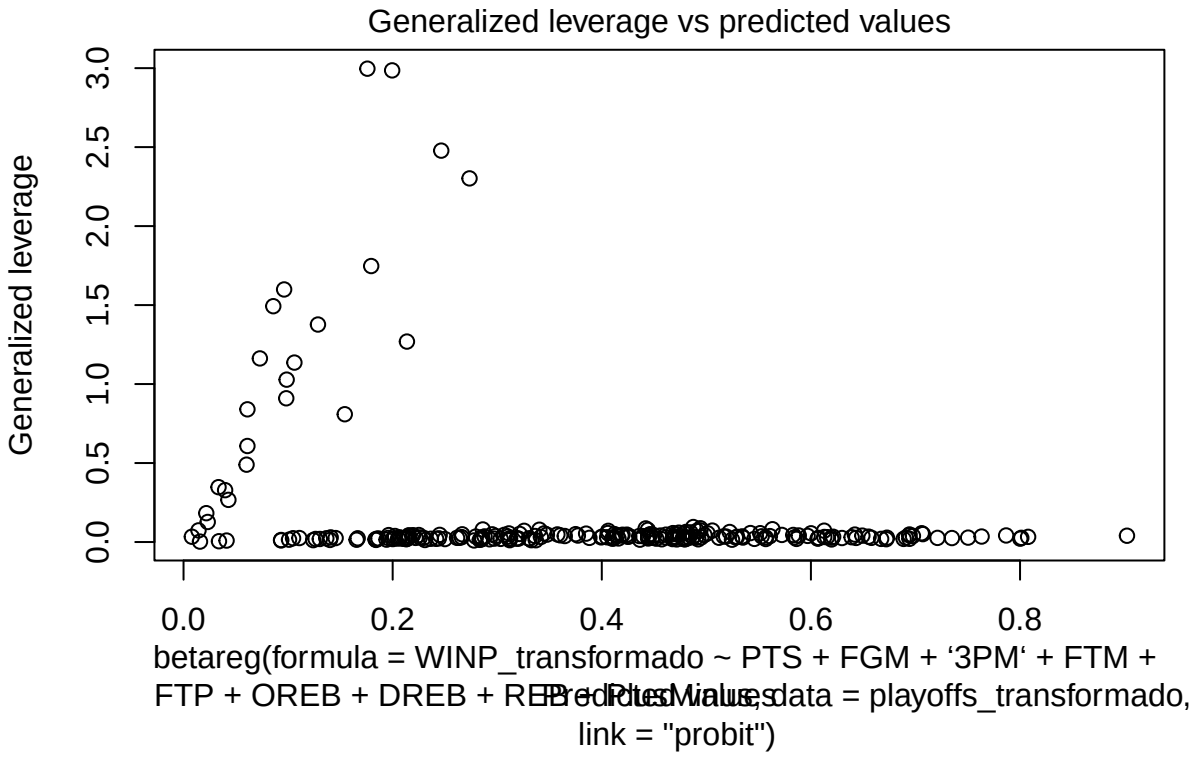
```
####### Modelo 5% ####
plot(modelo_betat_probit1, which = 1)
```



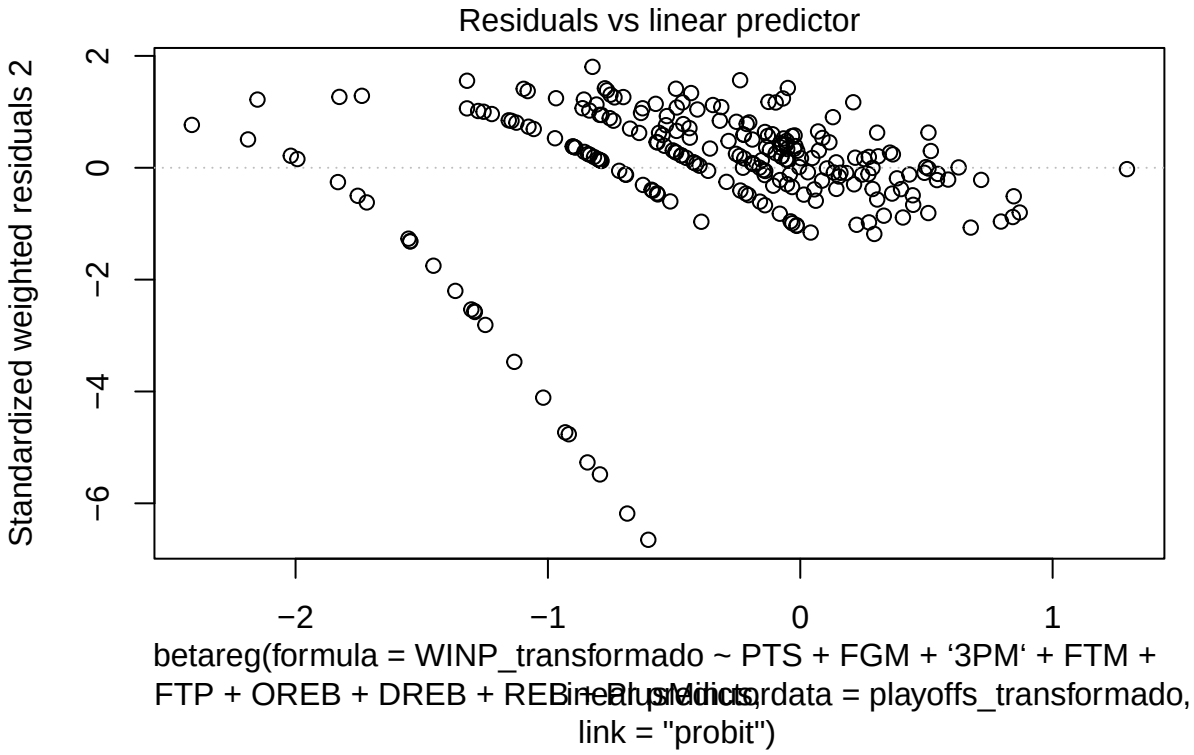

```
plot(modelo_betat_probit1, which = 2)
```



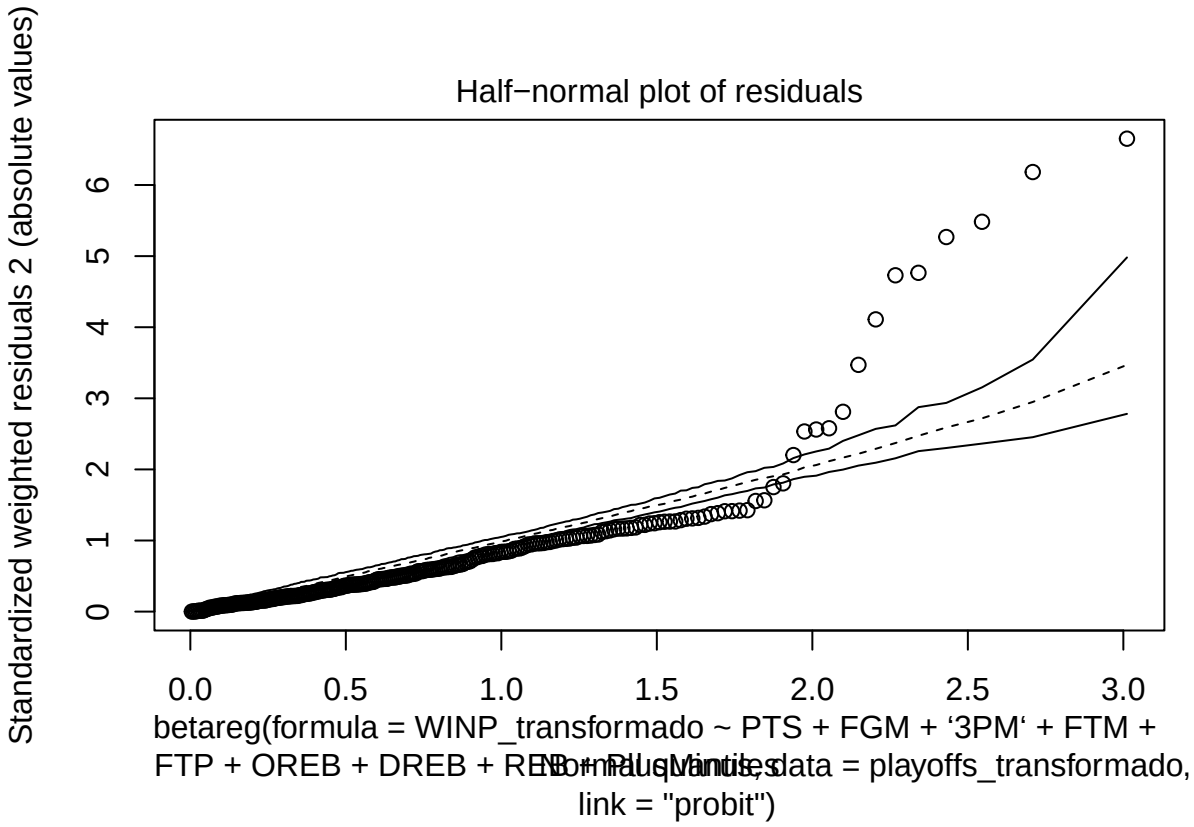

```
plot(modelo_betat_probit1, which = 3)
```



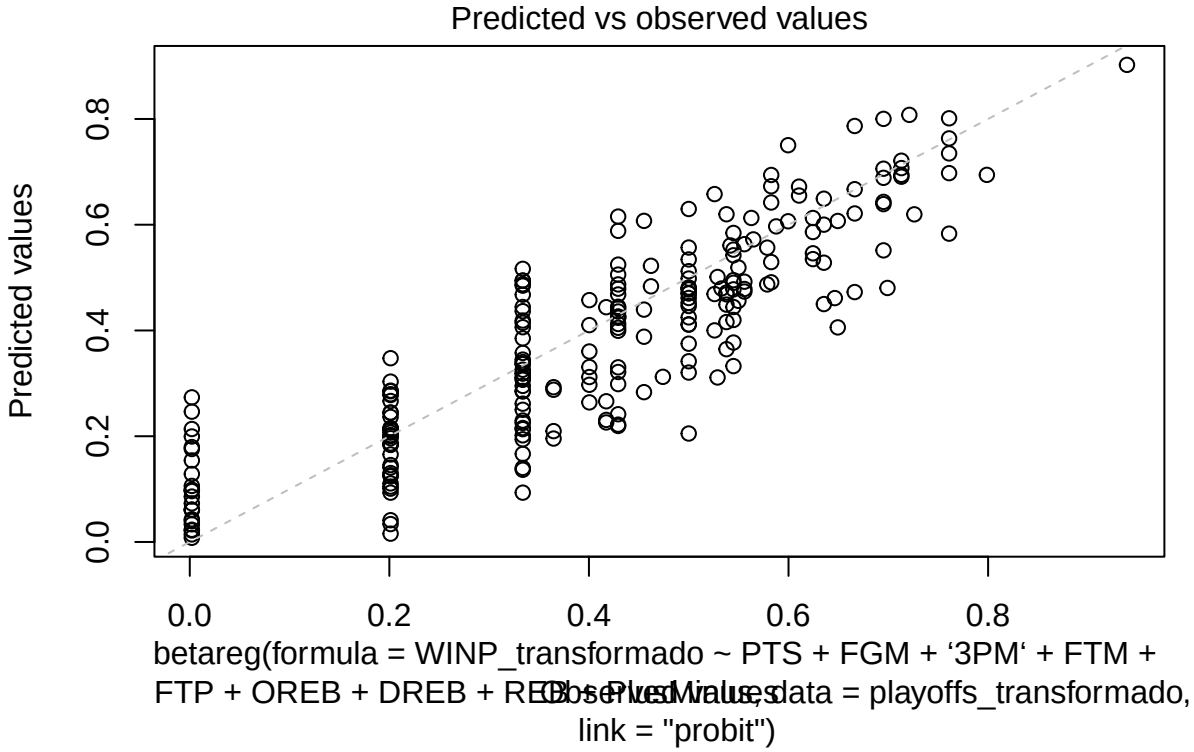

```
plot(modelo_betat_probit1, which = 4)
```




```
plot(modelo_betat_probit1, which = 5)
```




```
plot(modelo_betat_probit1, which = 6)
```



```r
shapiro.test(modelo_betat_probit1$residuals) #p-value =
```

```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_betat_probit1$residuals
## W = 0.99516, p-value = 0.6504
```

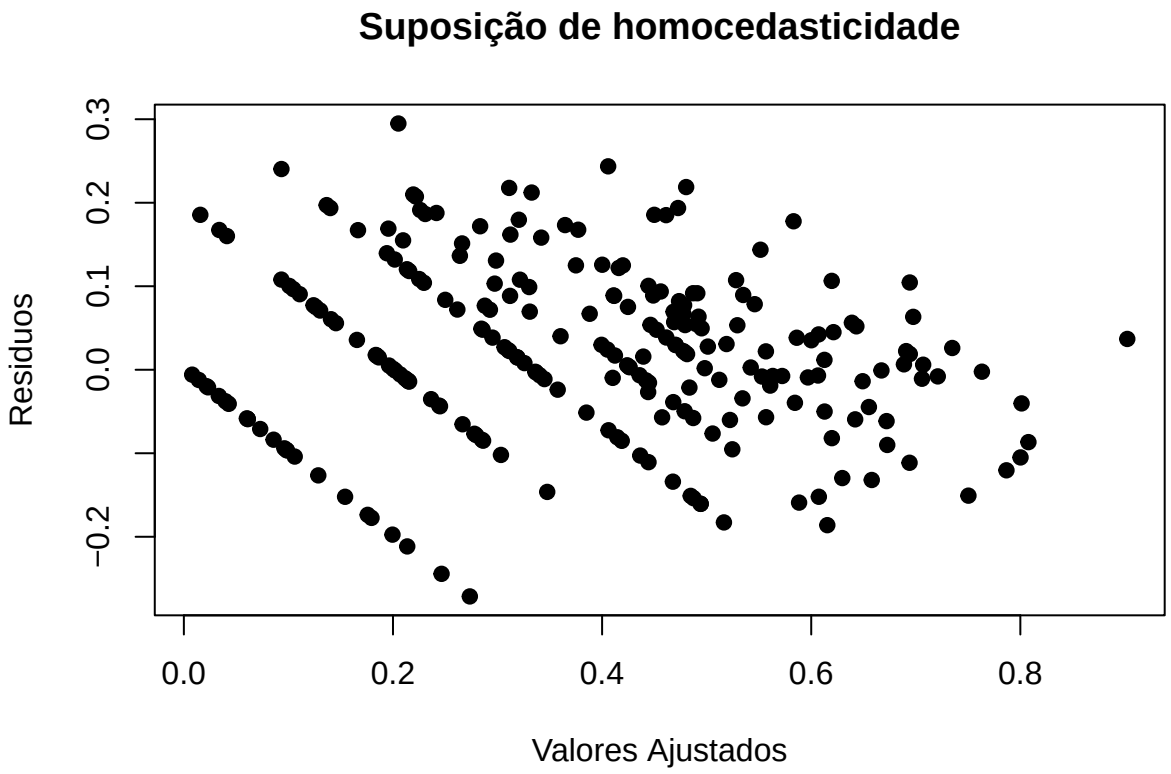
```r
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_betat_probit1) #p-value = 0.04034
```

```
##
##  Durbin-Watson test
##
## data:  modelo_betat_probit1
## DW = 1.7884, p-value = 0.04034
## alternative hypothesis: true autocorrelation is greater than 0
```

```r
#Independência
plot(modelo_betat_probit1$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```


```r
#Homocedasticidade
plot(modelo_betat_probit1$fitted.values, modelo_betat_probit1$residuals,
     xlab = "Valores Ajustados",
     ylab = "Residuos",
     pch = 19,
```

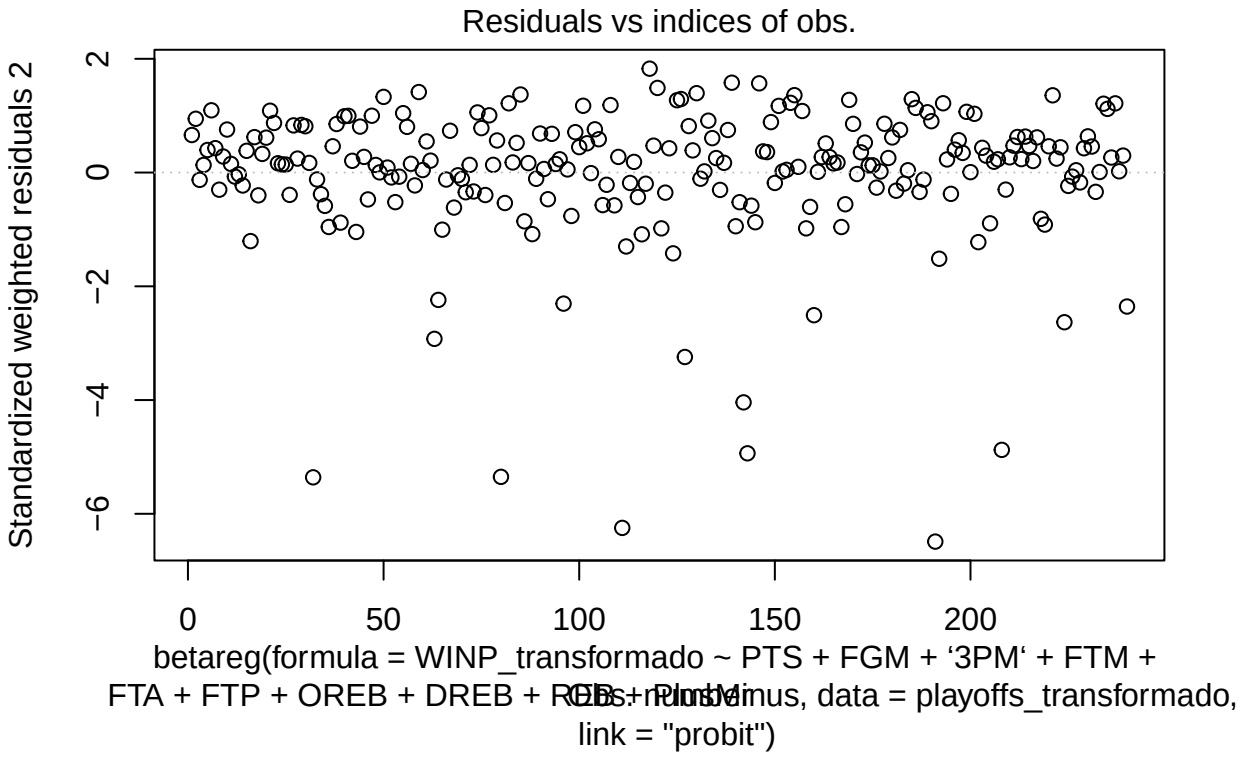
```
     main = "Suposição de homocedasticidade"
)
```



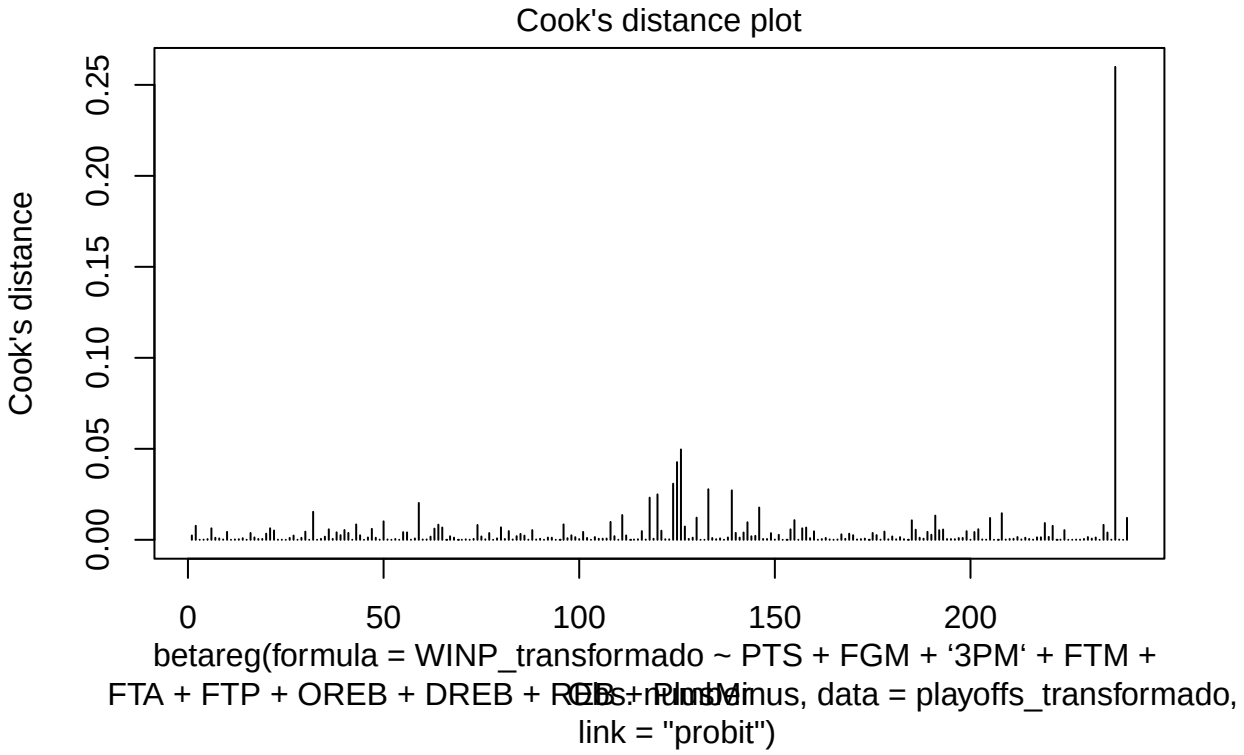

```
#Breusch_Pagan para homocedasticdade
bptest(modelo_betat_probit1) #p-value = 0.0007128, heterocedasticidade
```

```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_betat_probit1
## BP = 28.755, df = 9, p-value = 0.0007128
```

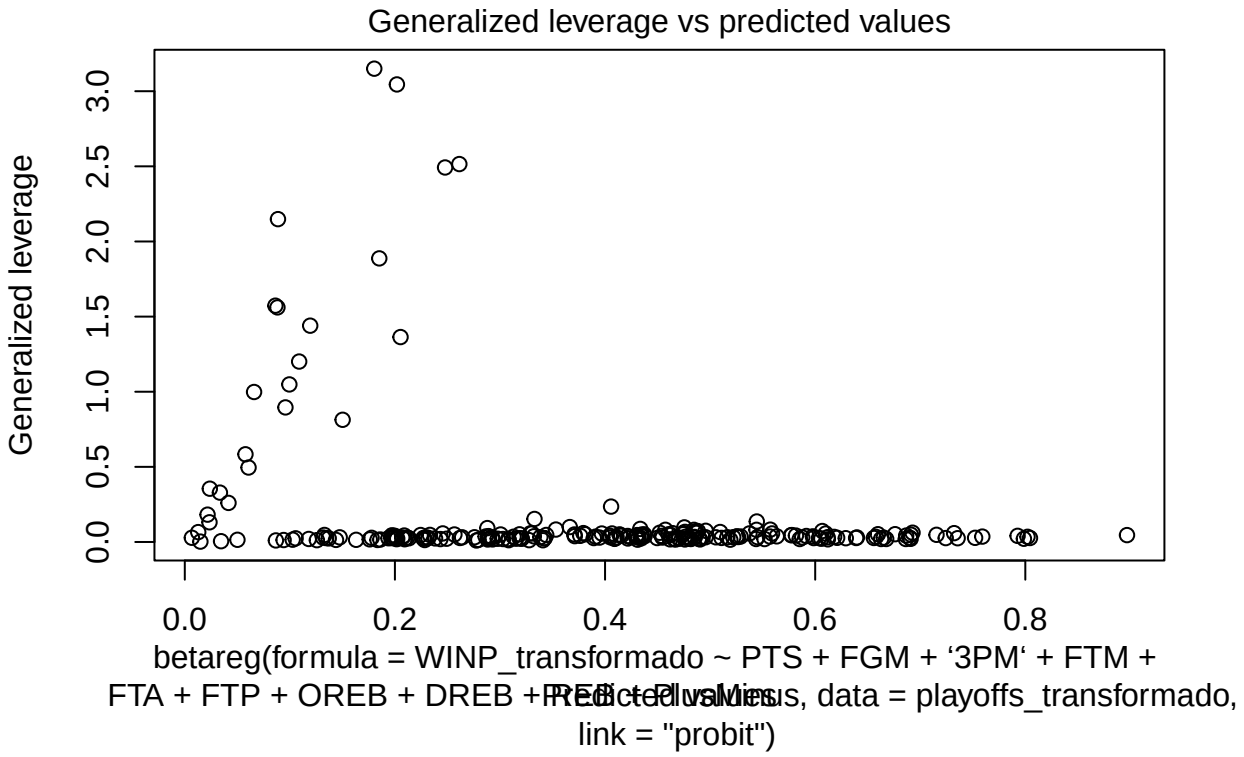
```
####### Modelo 10% ####
plot(modelo_betat_probit2, which = 1)
```



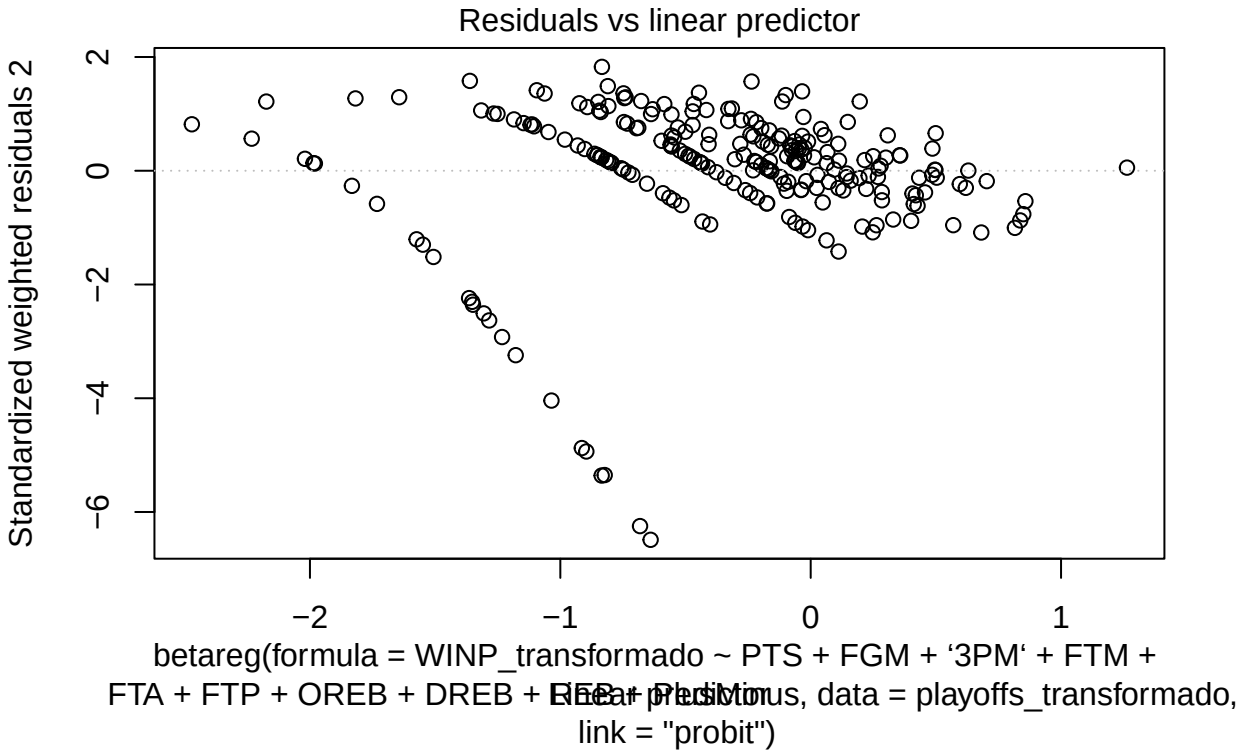

```
plot(modelo_betat_probit2, which = 2)
```



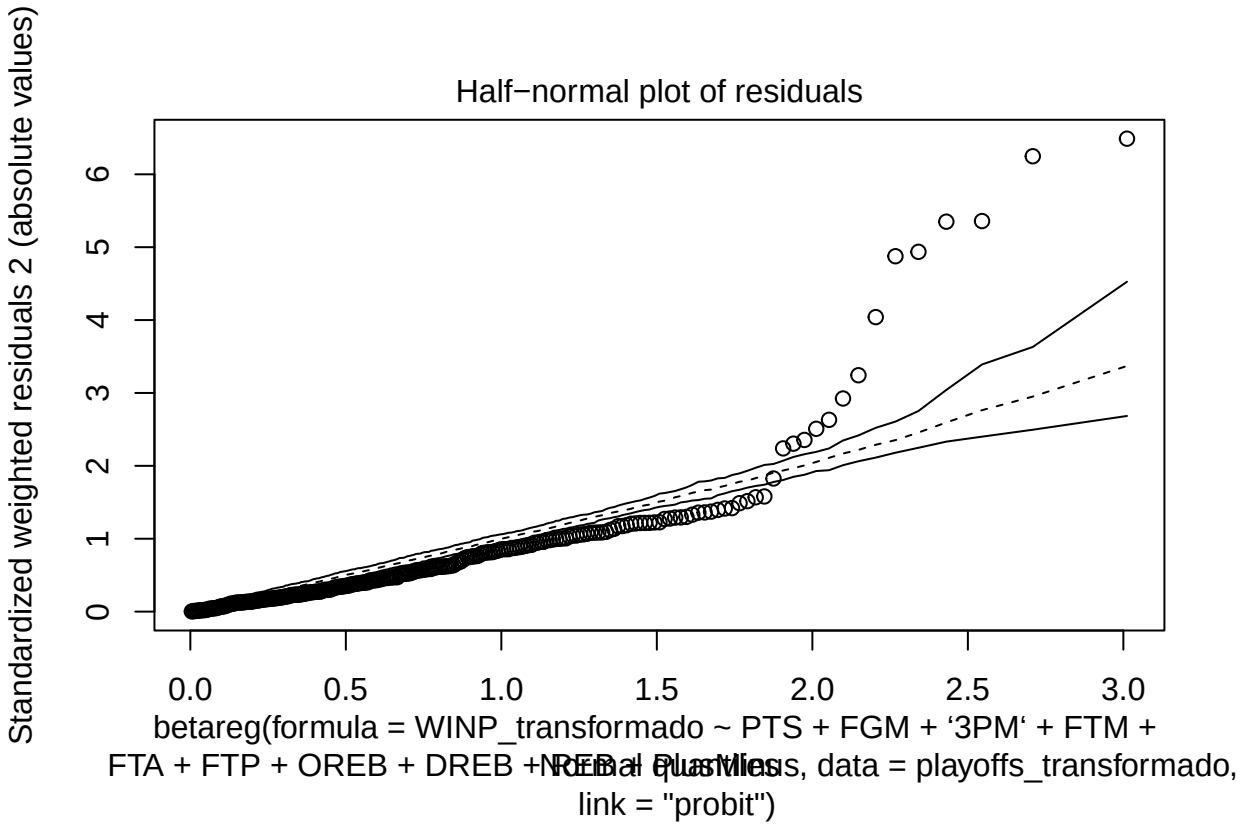

```
plot(modelo_betat_probit2, which = 3)
```



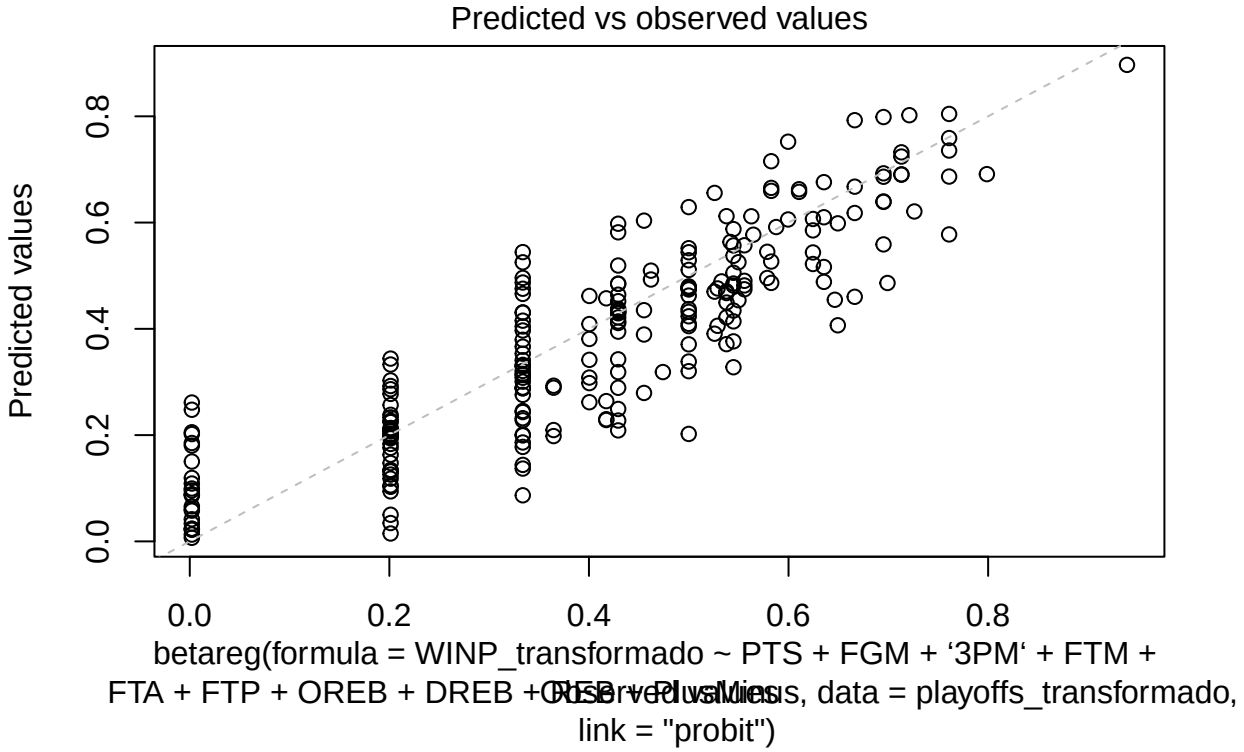

```
plot(modelo_betat_probit2, which = 4)
```




```
plot(modelo_betat_probit2, which = 5)
```




```
plot(modelo_betat_probit2, which = 6)
```



```r
shapiro.test(modelo_betat_probit2$residuals) #p-value =
```

```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_betat_probit2$residuals
## W = 0.99602, p-value = 0.8004
```

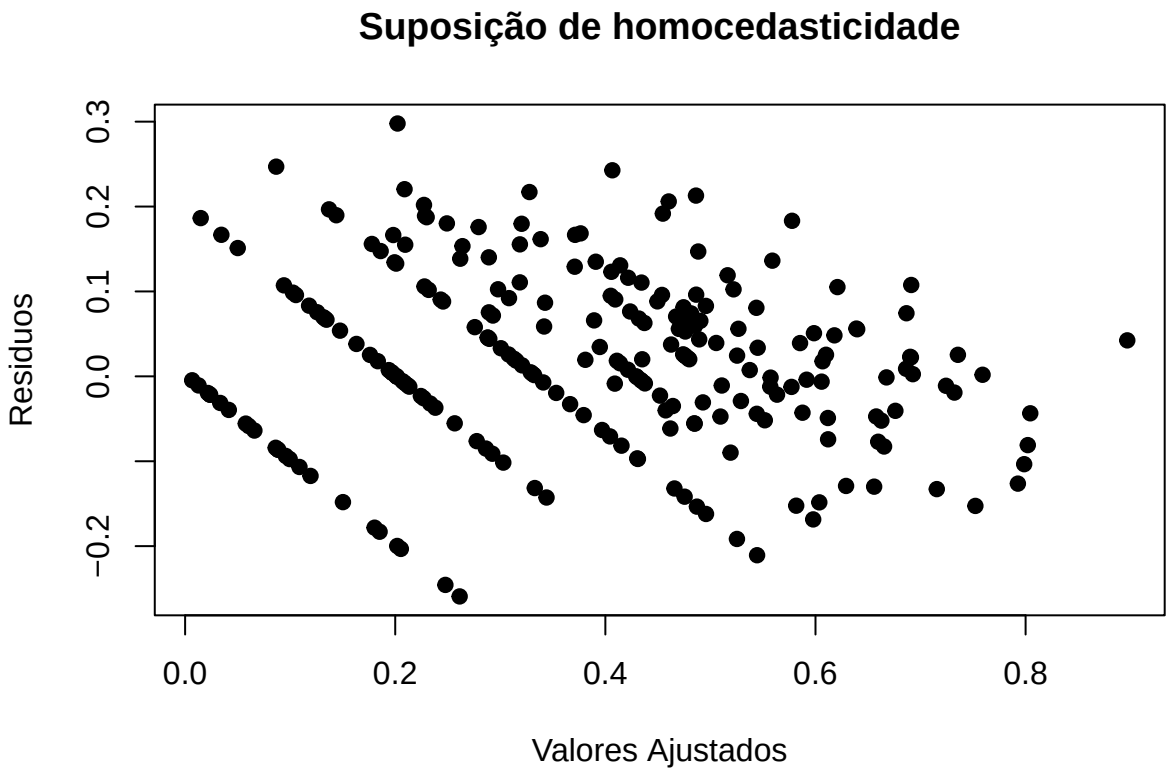
```r
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_betat_probit2) #p-value = 0.04034
```

```
##
##  Durbin-Watson test
##
## data:  modelo_betat_probit2
## DW = 1.7876, p-value = 0.03917
## alternative hypothesis: true autocorrelation is greater than 0
```

```r
#Independência
plot(modelo_betat_probit2$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```


```r
#Homocedasticidade
plot(modelo_betat_probit2$fitted.values, modelo_betat_probit2$residuals,
     xlab = "Valores Ajustados",
     ylab = "Residuos",
     pch = 19,
```

```
     main = "Suposição de homocedasticidade"
)
```




```
#Breusch_Pagan para homocedasticdade
bptest(modelo_betat_probit2) #p-value = 0.0007128, heterocedasticidade
```

```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_betat_probit2
## BP = 28.674, df = 10, p-value = 0.001407
```

```
######### cloglog ######
####### Modelo completo ####
shapiro.test(modelo_betat_cloglog$residuals) #p-value =
```

```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_betat_cloglog$residuals
## W = 0.98468, p-value = 0.01101
```

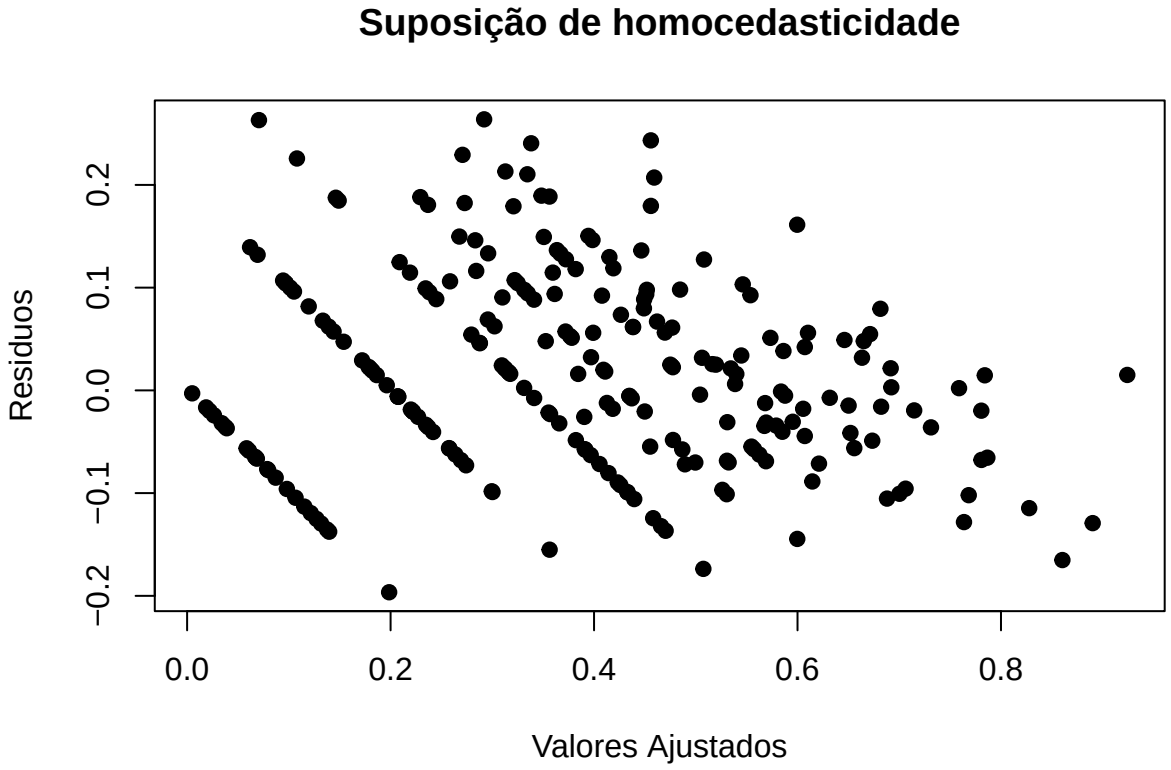
```
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_betat_cloglog) #p-value = 0.04034
```

```
##
##  Durbin-Watson test
##
## data:  modelo_betat_cloglog
## DW = 1.9021, p-value = 0.04183
```

```
## alternative hypothesis: true autocorrelation is greater than 0
```

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

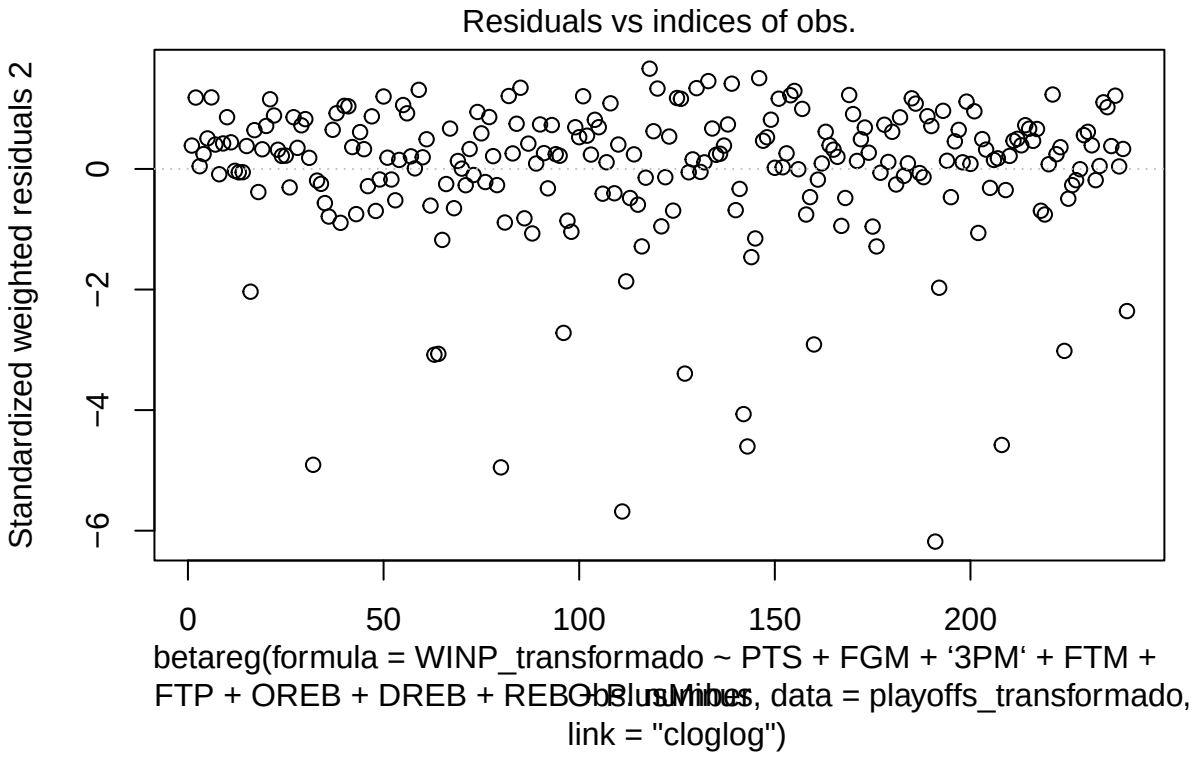

```
#Homocedasticidade
plot(modelo_betat_cloglog$fitted.values, modelo_betat_cloglog$residuals,
     xlab = "Valores Ajustados",
     ylab = "Residuos",
     pch = 19,
     main = "Suposição de homocedasticidade"
)
```



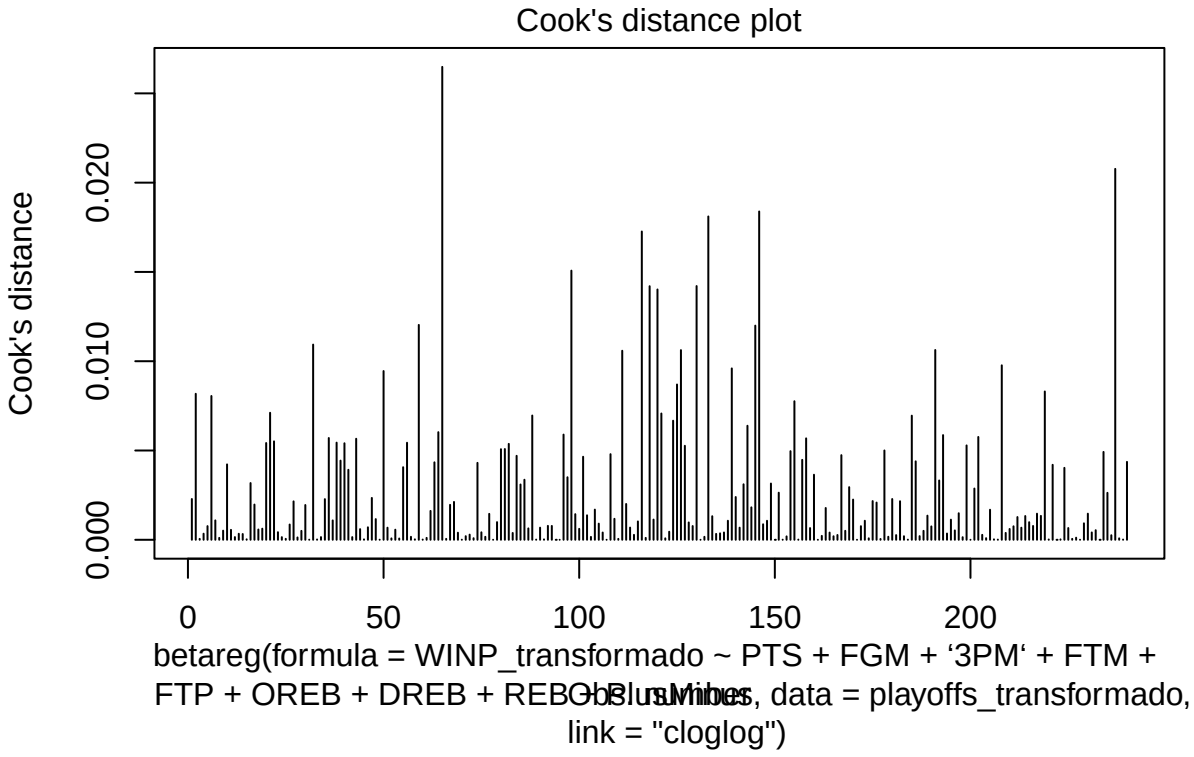

```
#Breusch_Pagan para homocedasticdade
bptest(modelo_betat_cloglog) #p-value = 0.0007128, heterocedasticidade
```

```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_betat_cloglog
## BP = 88.168, df = 67, p-value = 0.04258
```

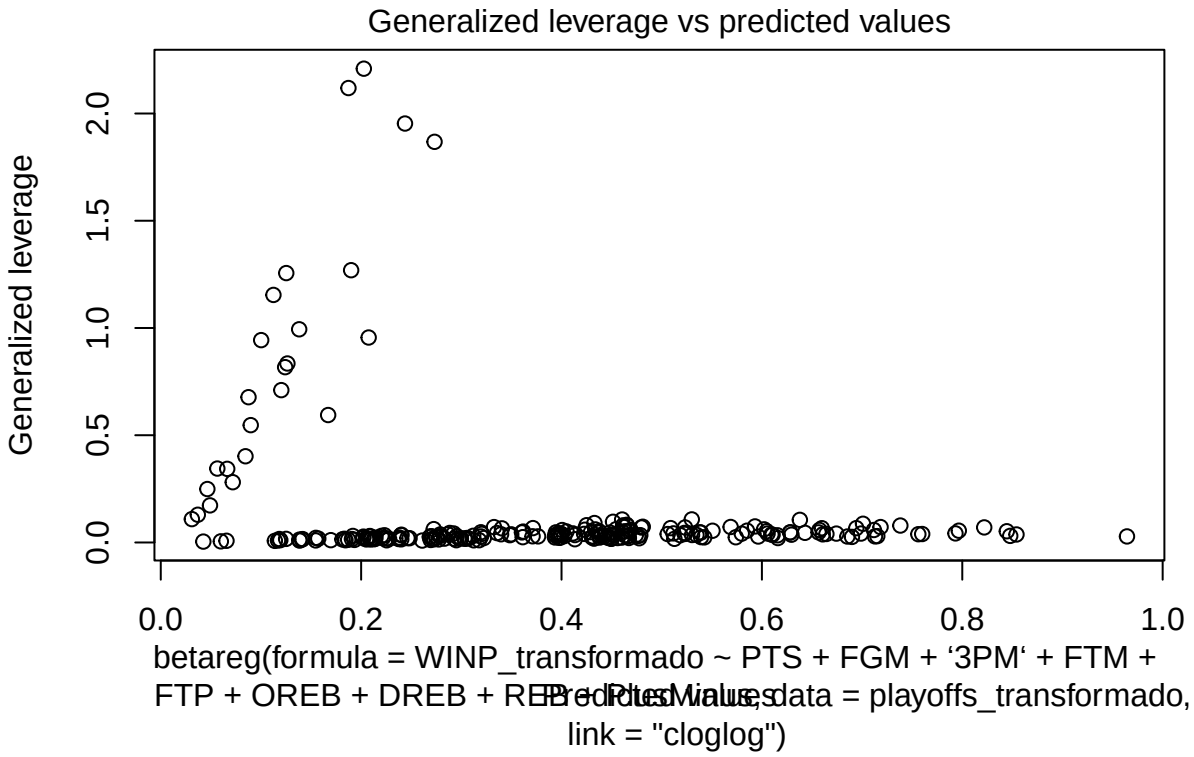
```
####### Modelo 5% ####
plot(modelo_betat_cloglog1, which = 1)
```



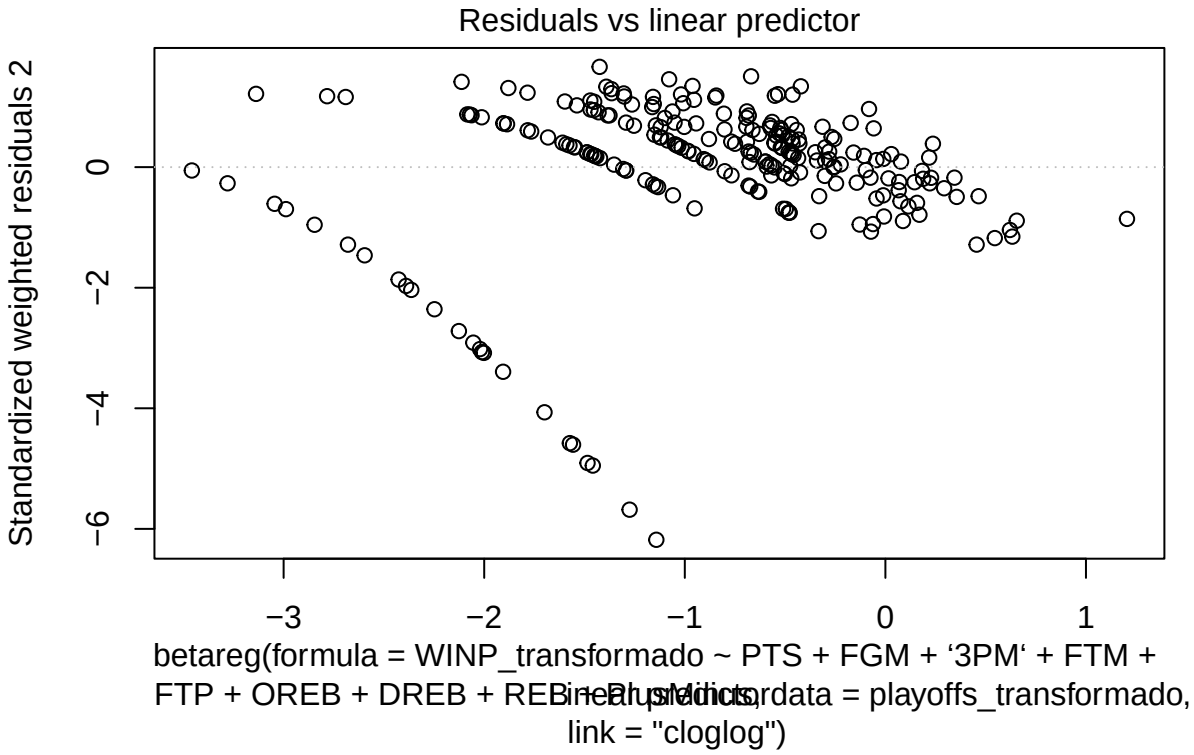

```
plot(modelo_betat_cloglog1, which = 2)
```



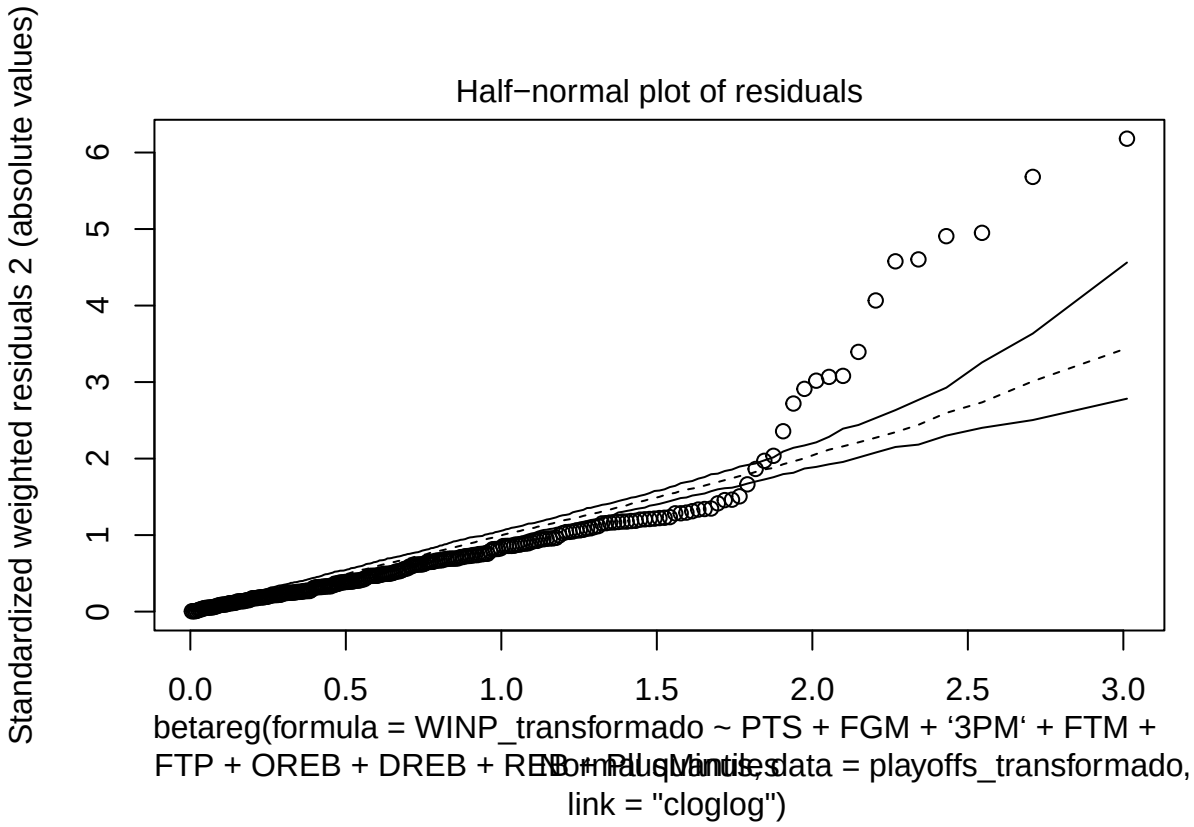

```
plot(modelo_betat_cloglog1, which = 3)
```



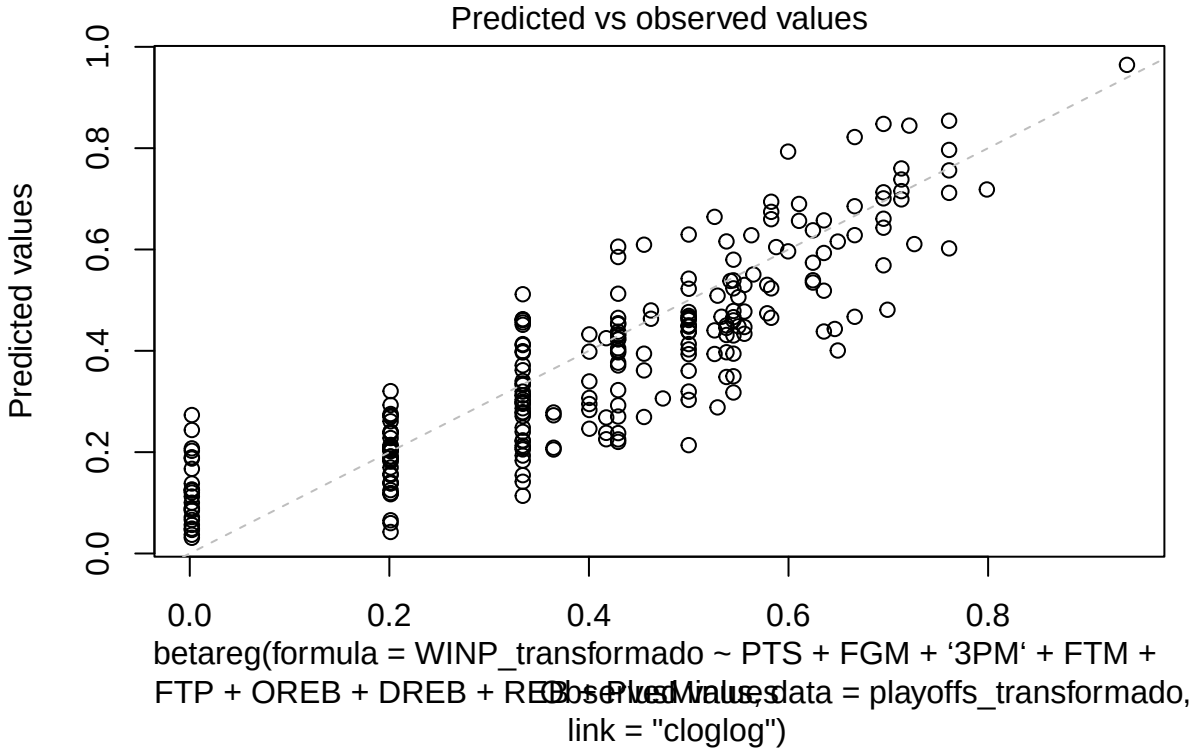

```
plot(modelo_betat_cloglog1, which = 4)
```




```
plot(modelo_betat_cloglog1, which = 5)
```




```
plot(modelo_betat_cloglog1, which = 6)
```



```r
shapiro.test(modelo_betat_cloglog1$residuals) #p-value =
```

```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_betat_cloglog1$residuals
## W = 0.99532, p-value = 0.6791
```

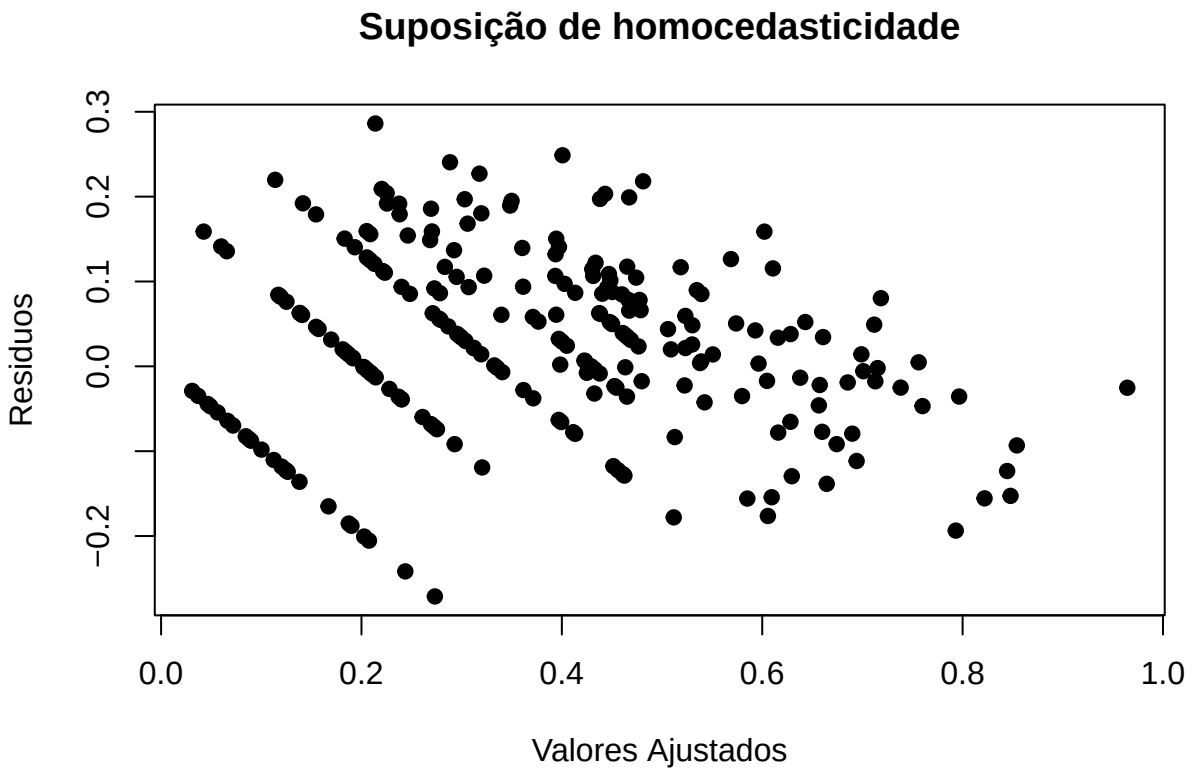
```r
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_betat_cloglog1) #p-value = 0.04034
```

```
##
##  Durbin-Watson test
##
## data:  modelo_betat_cloglog1
## DW = 1.7884, p-value = 0.04034
## alternative hypothesis: true autocorrelation is greater than 0
```

```r
#Independência
plot(modelo_betat_cloglog1$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```


```r
#Homocedasticidade
plot(modelo_betat_cloglog1$fitted.values, modelo_betat_cloglog1$residuals,
     xlab = "Valores Ajustados",
     ylab = "Residuos",
     pch = 19,
```

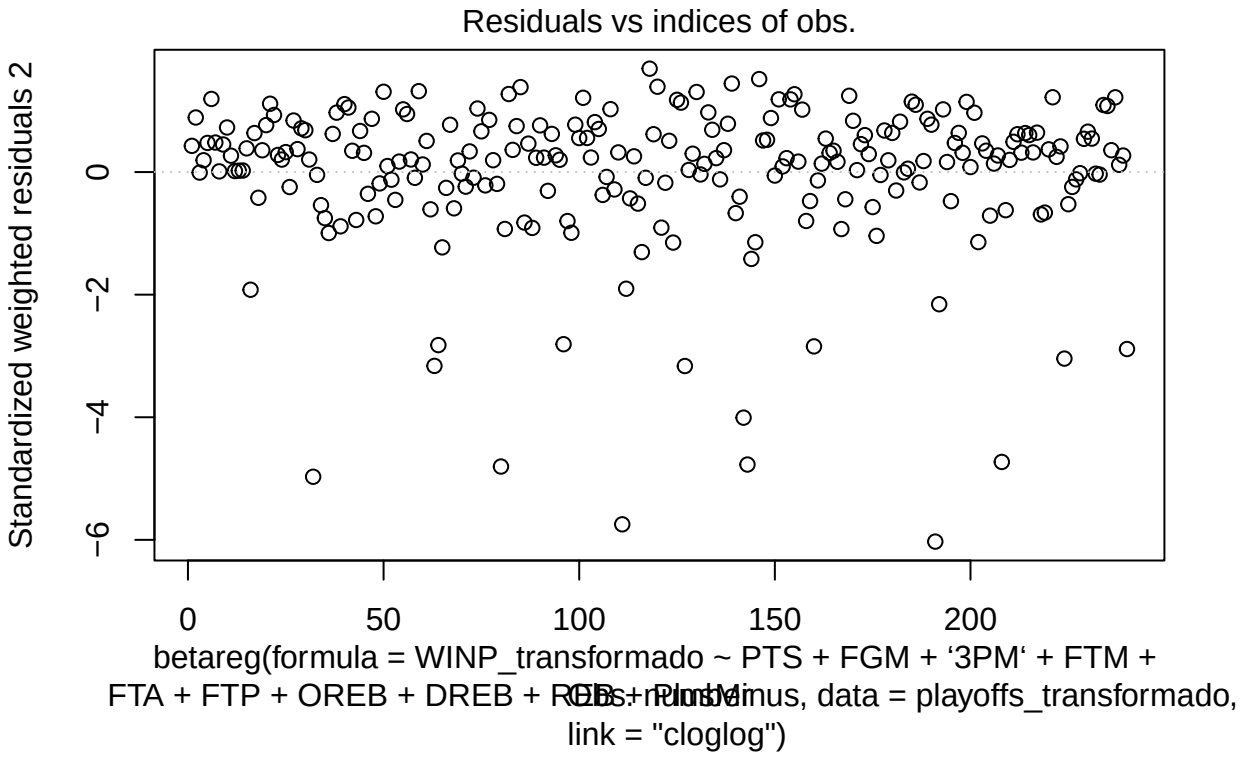
```
     main = "Suposição de homocedasticidade"
)
```



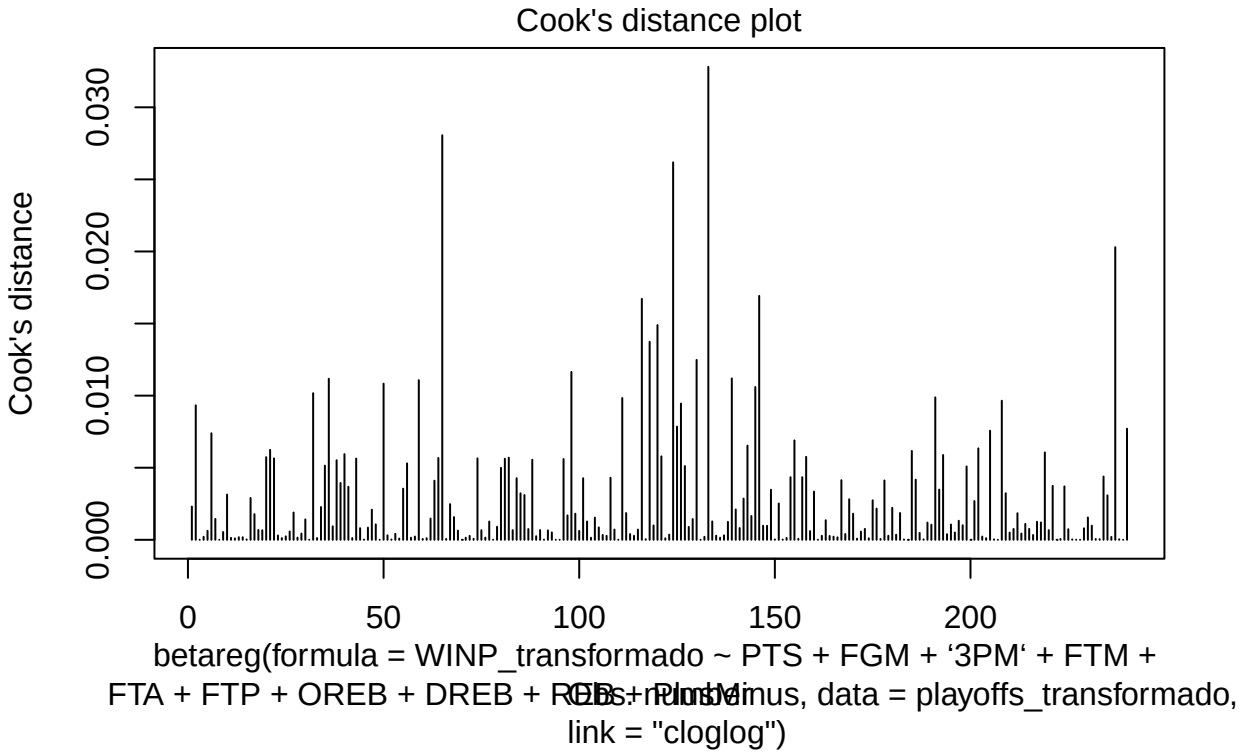

```
#Breusch_Pagan para homocedasticdade
bptest(modelo_betat_cloglog1) #p-value =
```

```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_betat_cloglog1
## BP = 28.755, df = 9, p-value = 0.0007128
```

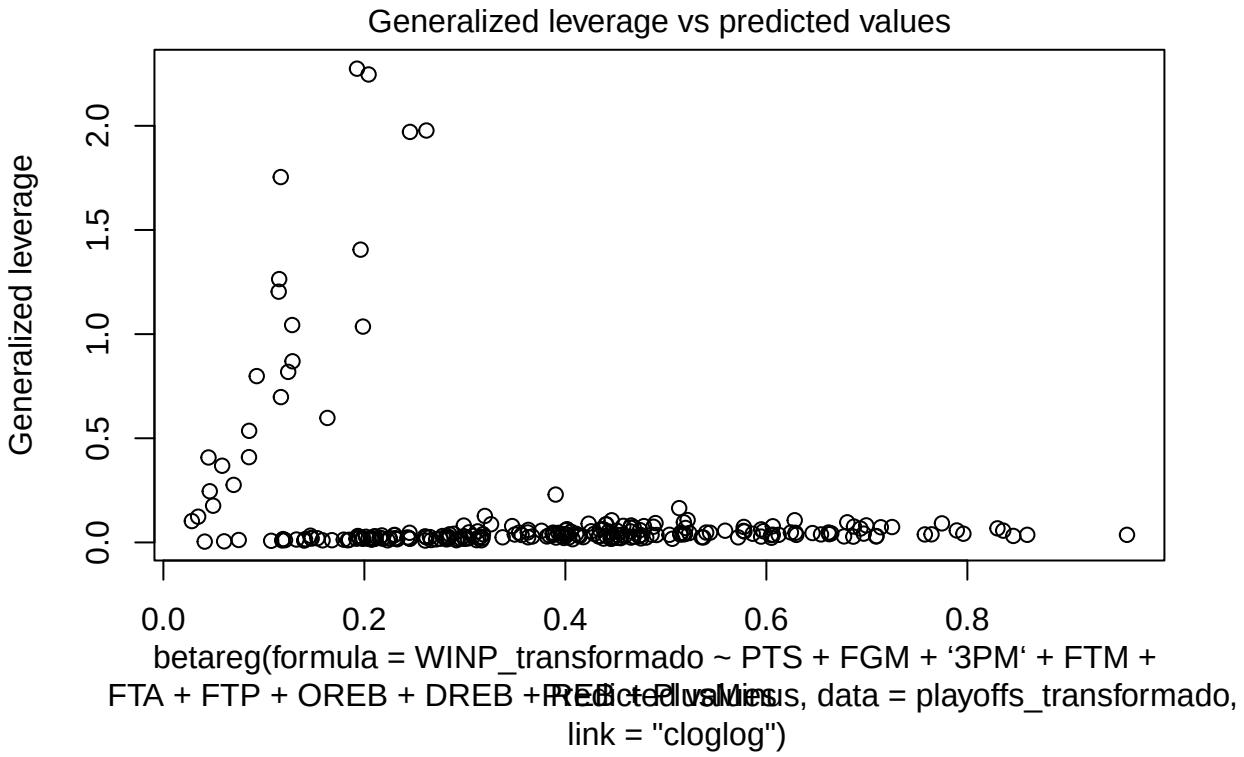
```
####### Modelo 10% ####
plot(modelo_betat_cloglog2, which = 1)
```



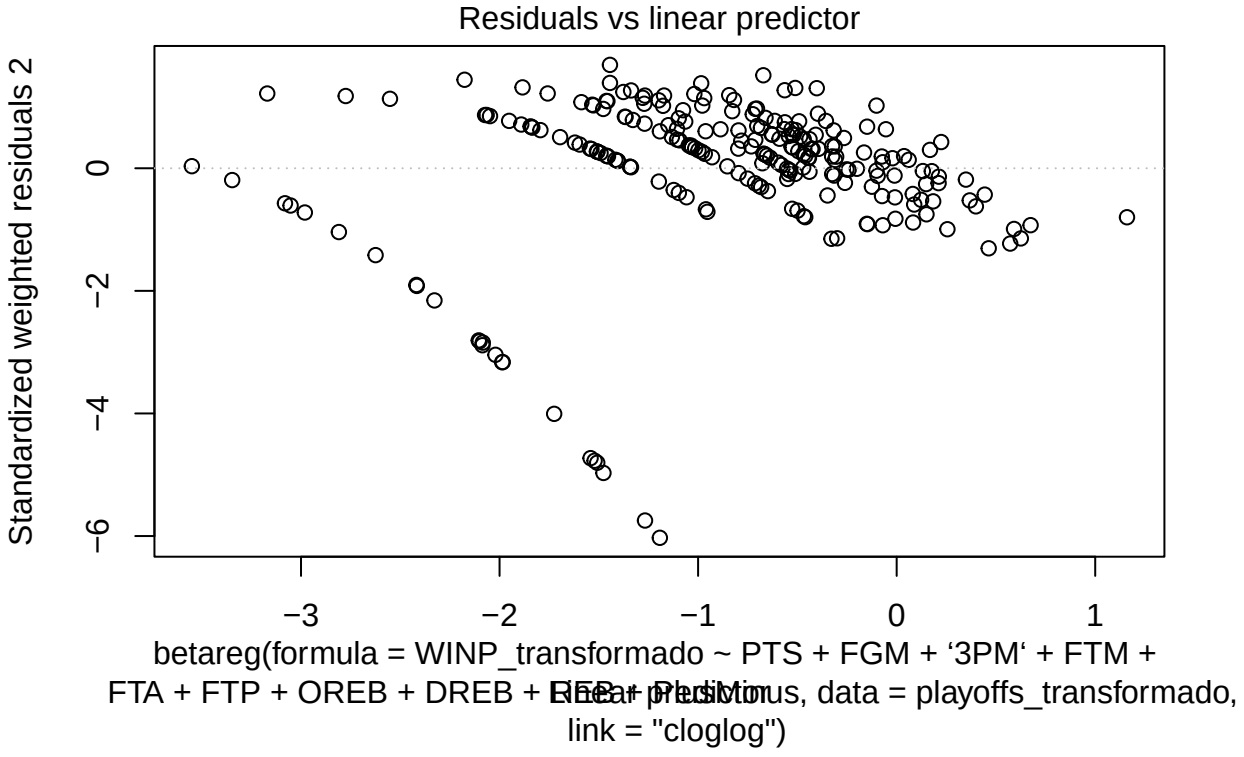

```
plot(modelo_betat_cloglog2, which = 2)
```



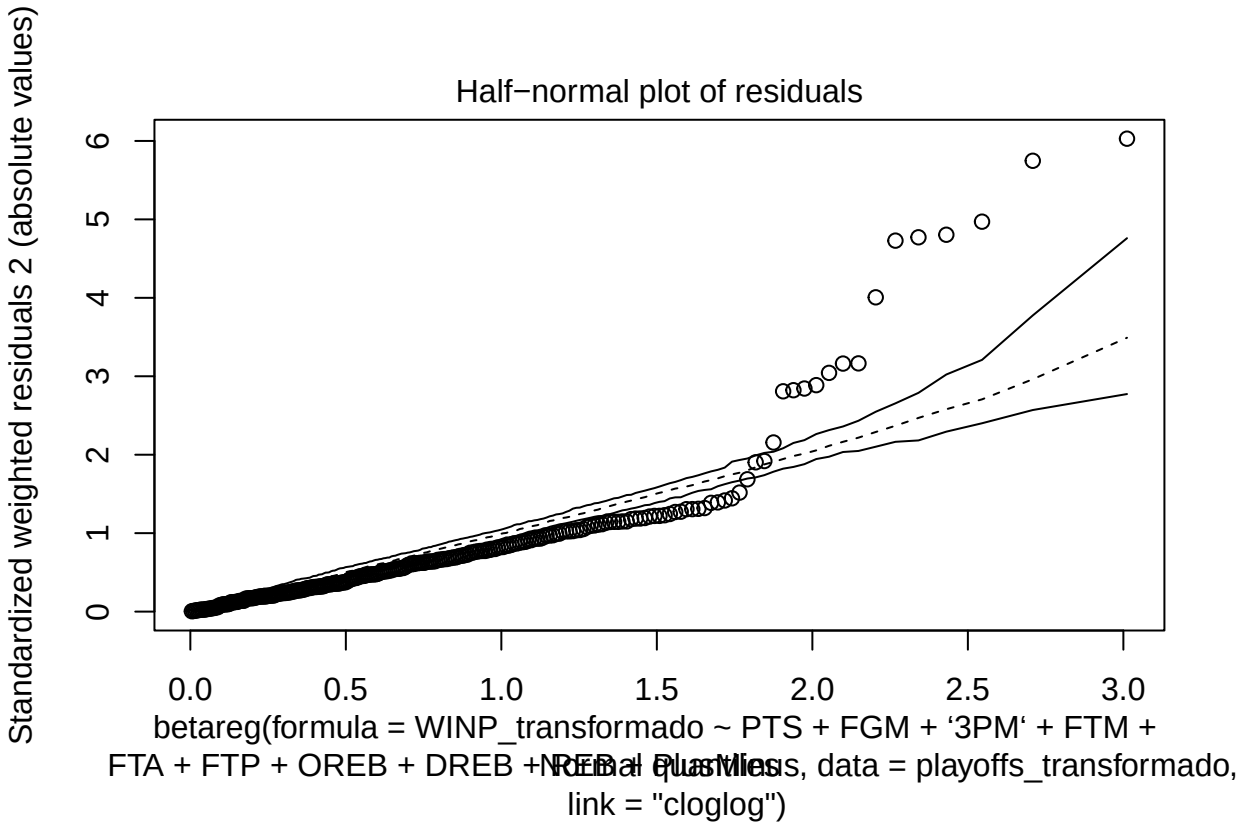

```
plot(modelo_betat_cloglog2, which = 3)
```



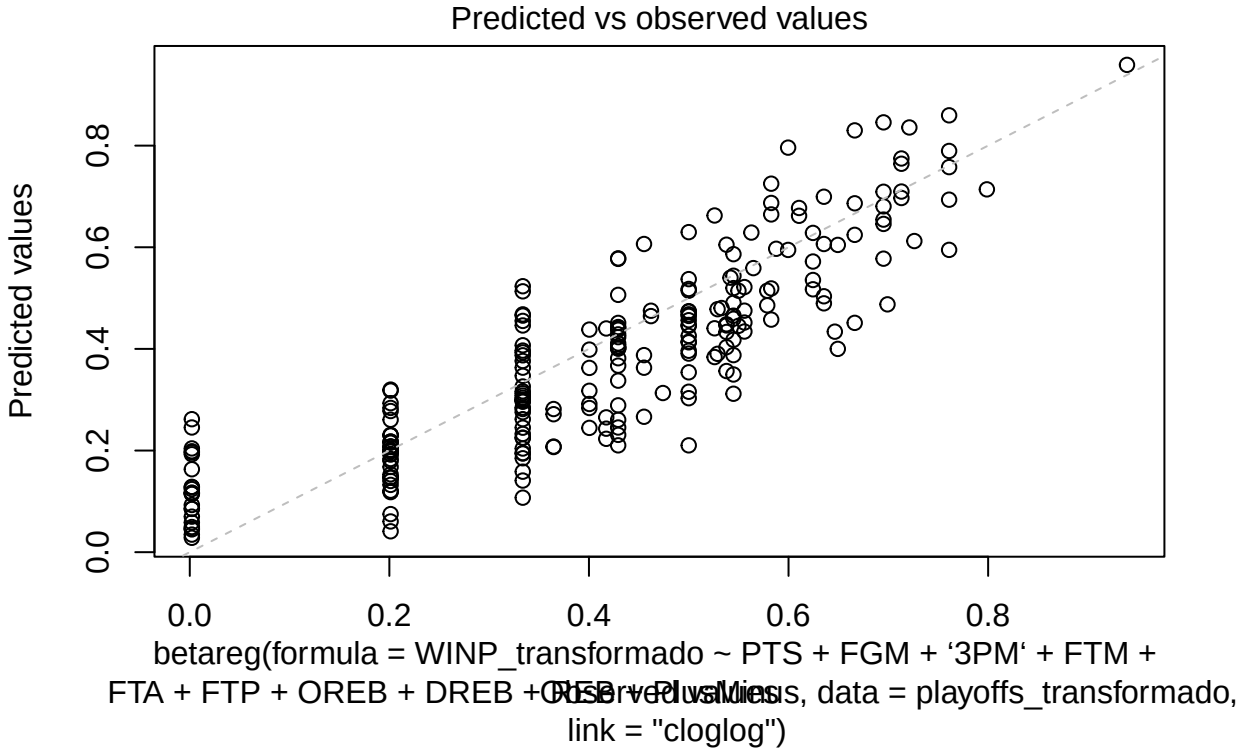

```
plot(modelo_betat_cloglog2, which = 4)
```




```
plot(modelo_betat_cloglog2, which = 5)
```




```
plot(modelo_betat_cloglog2, which = 6)
```



```r
shapiro.test(modelo_betat_cloglog2$residuals) #p-value =
```

```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_betat_cloglog2$residuals
## W = 0.99432, p-value = 0.505
```

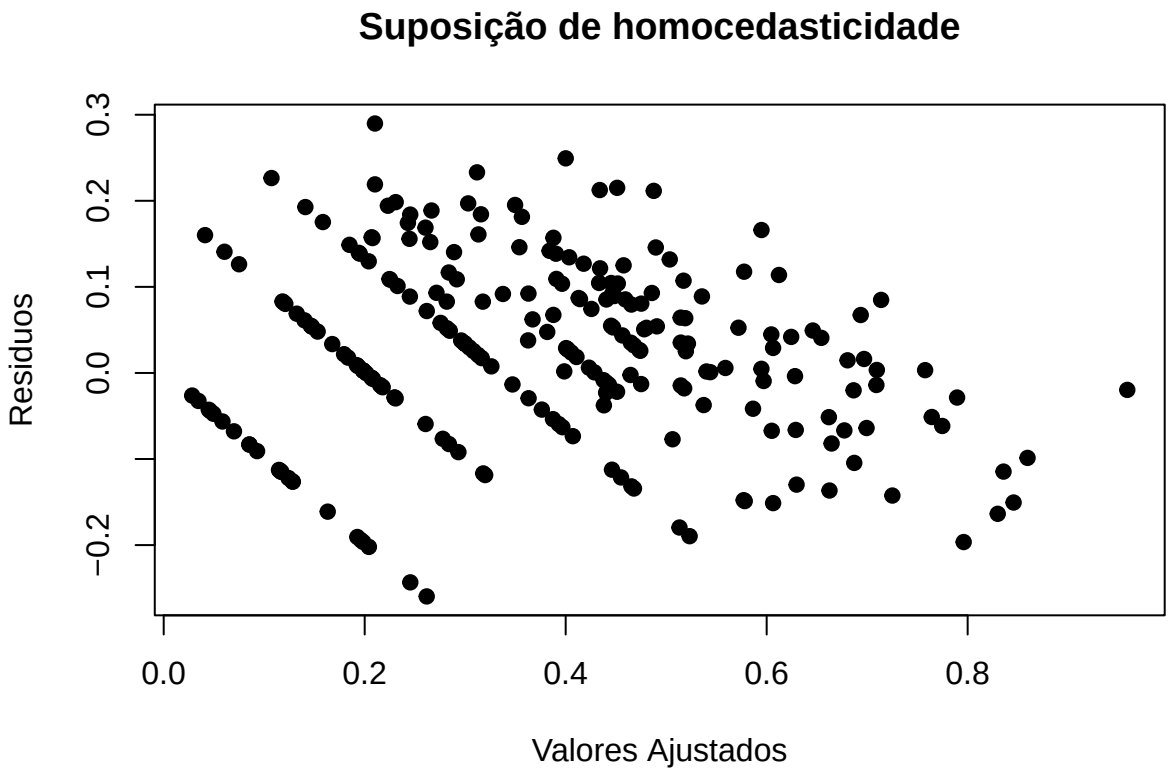
```r
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_betat_cloglog2) #p-value = 0.04034
```

```
##
##  Durbin-Watson test
##
## data:  modelo_betat_cloglog2
## DW = 1.7876, p-value = 0.03917
## alternative hypothesis: true autocorrelation is greater than 0
```

```r
#Independência
plot(modelo_betat_cloglog2$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```


```r
#Homocedasticidade
plot(modelo_betat_cloglog2$fitted.values, modelo_betat_cloglog2$residuals,
     xlab = "Valores Ajustados",
     ylab = "Residuos",
     pch = 19,
```

```
     main = "Suposição de homocedasticidade"
)
```




```
#Breusch_Pagan para homocedasticdade
bptest(modelo_betat_cloglog2) #p-value = 0.0007128, heterocedasticidade
```

```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_betat_cloglog2
## BP = 28.674, df = 10, p-value = 0.001407
```

```
######### cauchito ######
#### Modelo Completo ####
shapiro.test(modelo_betat_cauchit$residuals) #p-value =
```

```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_betat_cauchit$residuals
## W = 0.98671, p-value = 0.02508
```

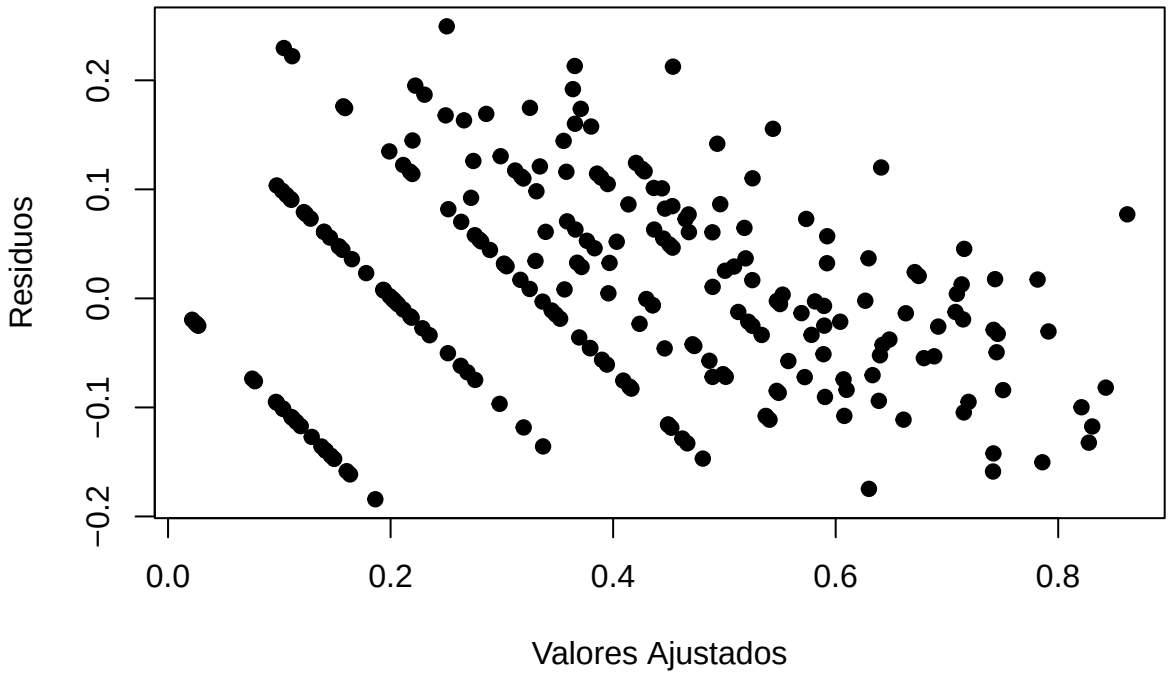
```
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_betat_cauchit) #p-value = 0.04034
```

```
##
##  Durbin-Watson test
##
## data:  modelo_betat_cauchit
## DW = 1.9021, p-value = 0.04183
```

```
## alternative hypothesis: true autocorrelation is greater than 0
```

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

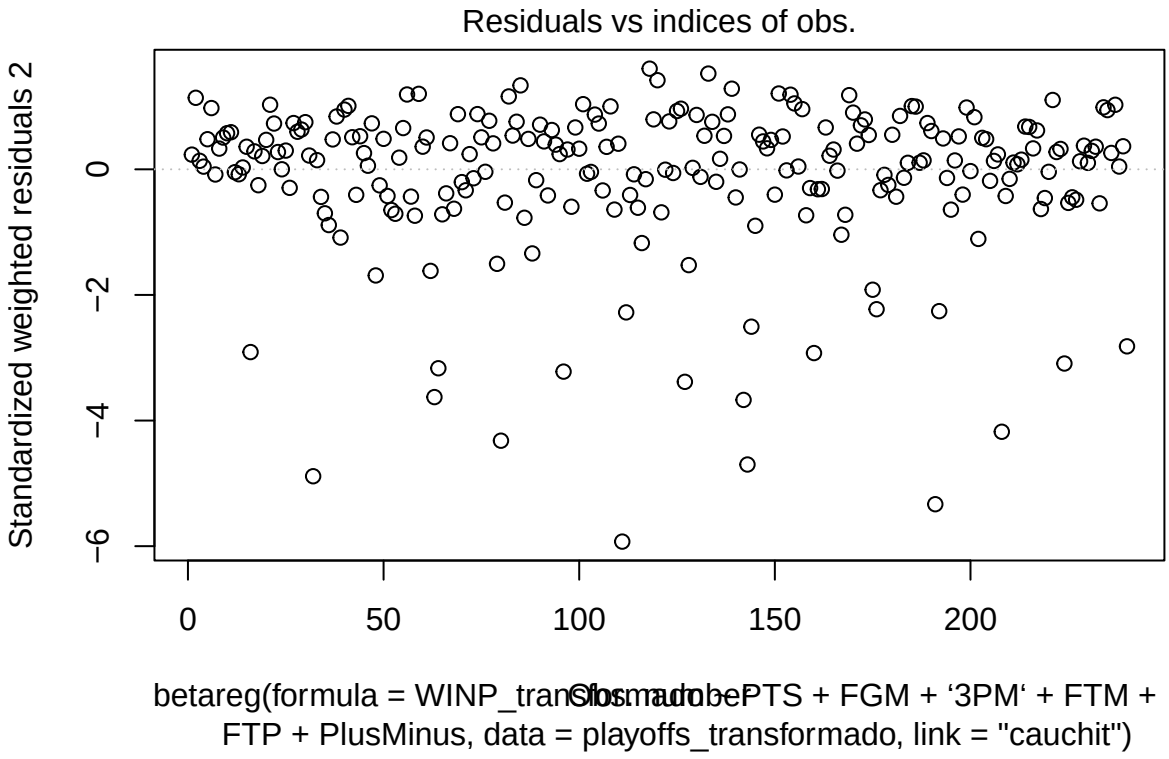

```
#Homocedasticidade
plot(modelo_betat_cauchit$fitted.values, modelo_betat_cauchit$residuals,
     xlab = "Valores Ajustados",
     ylab = "Residuos",
     pch = 19,
     main = "Suposição de homocedasticidade"
)
```



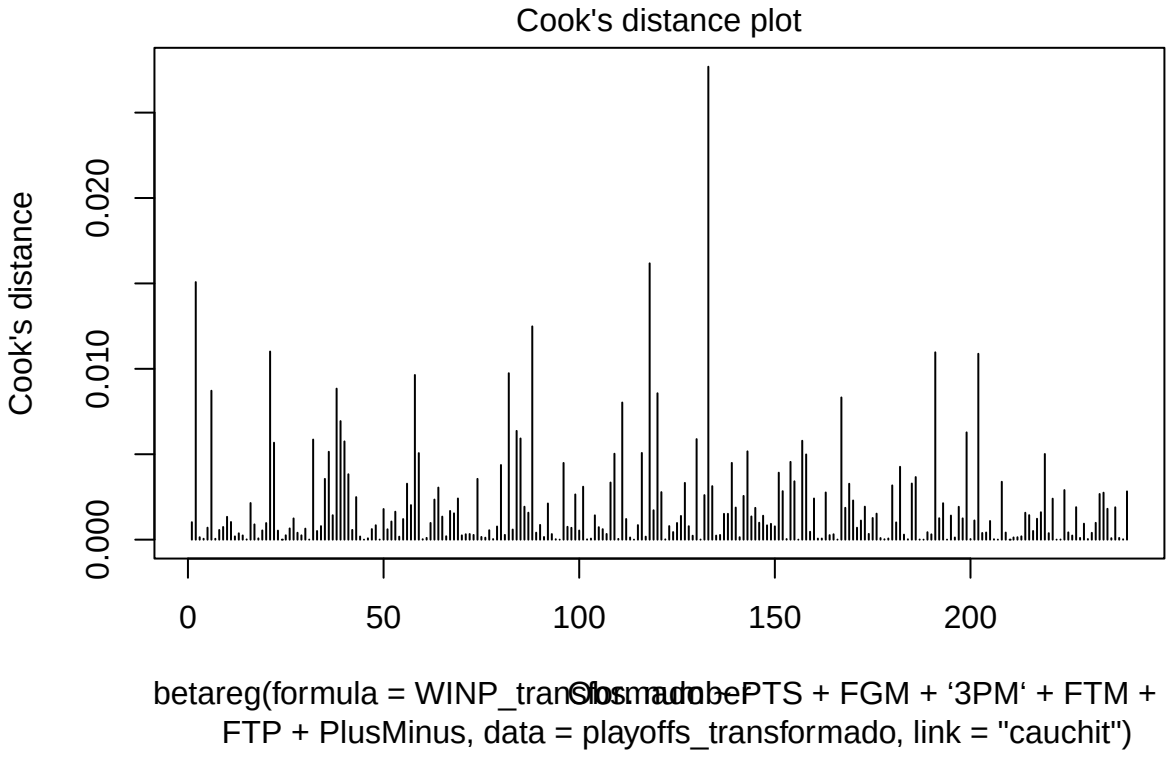

```
#Breusch_Pagan para homocedasticdade
bptest(modelo_betat_cauchit) #p-value = 0.0007128, heterocedasticidade
```

```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_betat_cauchit
## BP = 88.168, df = 67, p-value = 0.04258
```

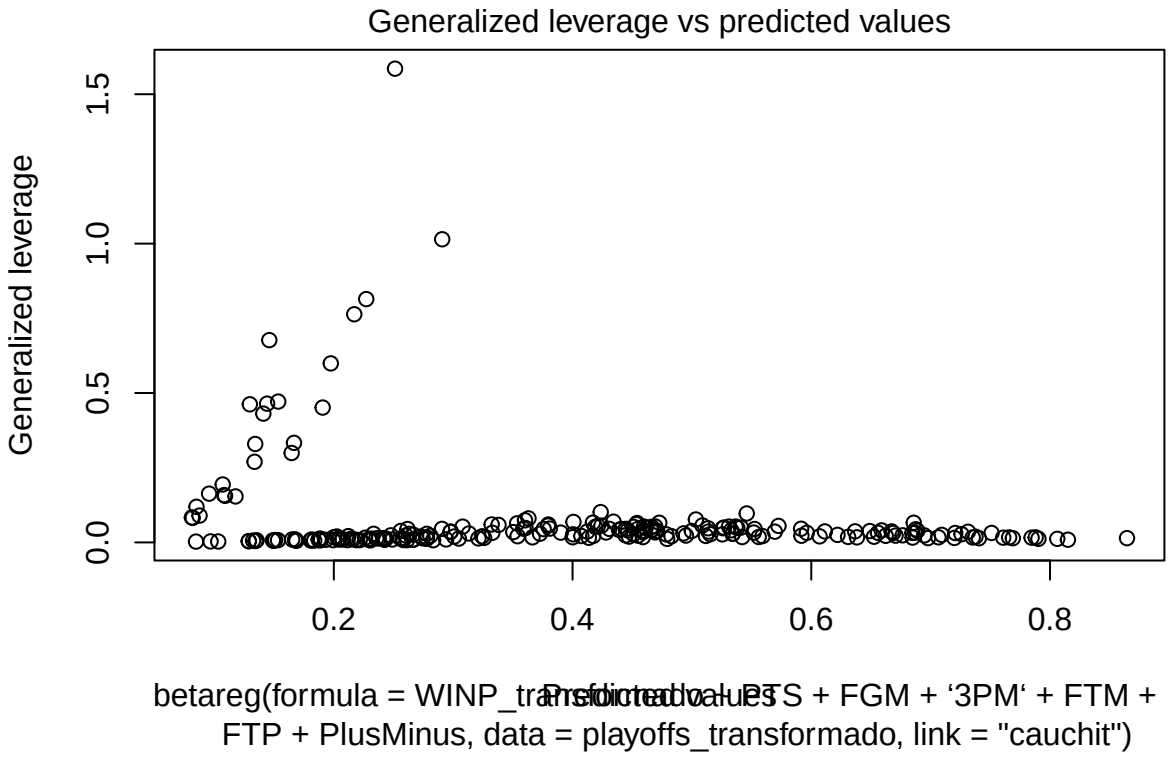
```
#### Modelo 5% ####
plot(modelo_betat_cauchit1, which = 1)
```



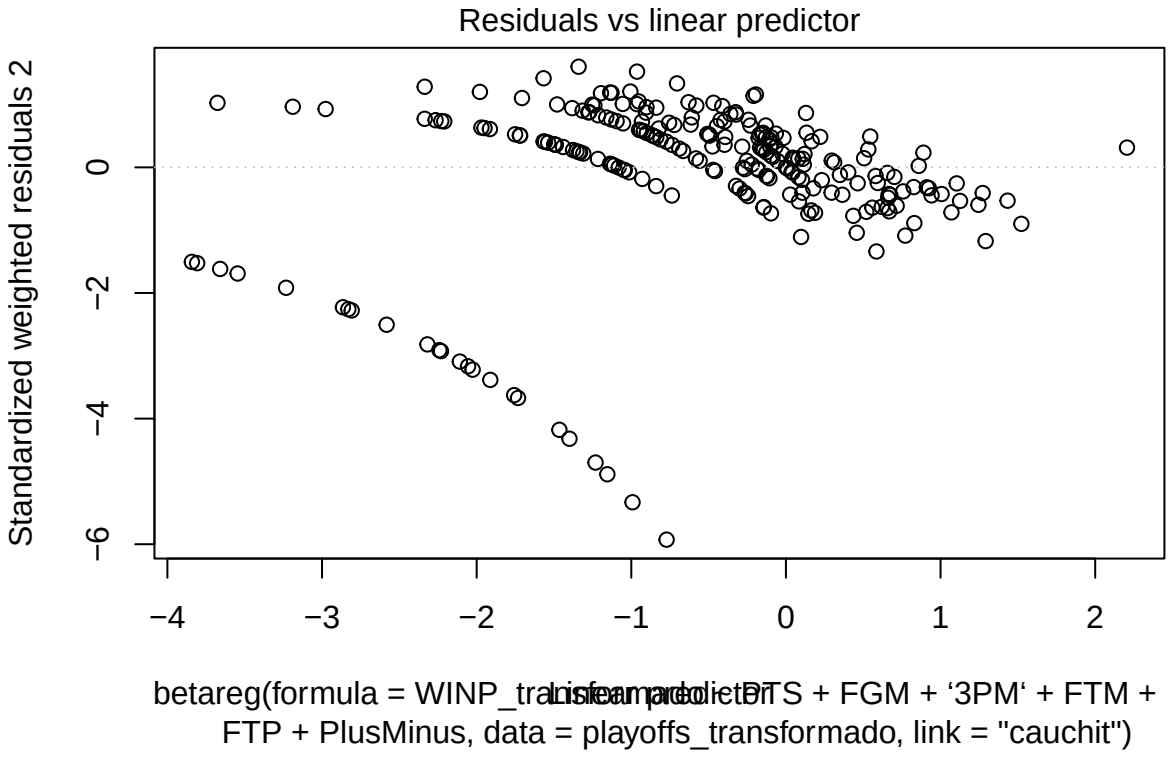

```
plot(modelo_betat_cauchit1, which = 2)
```



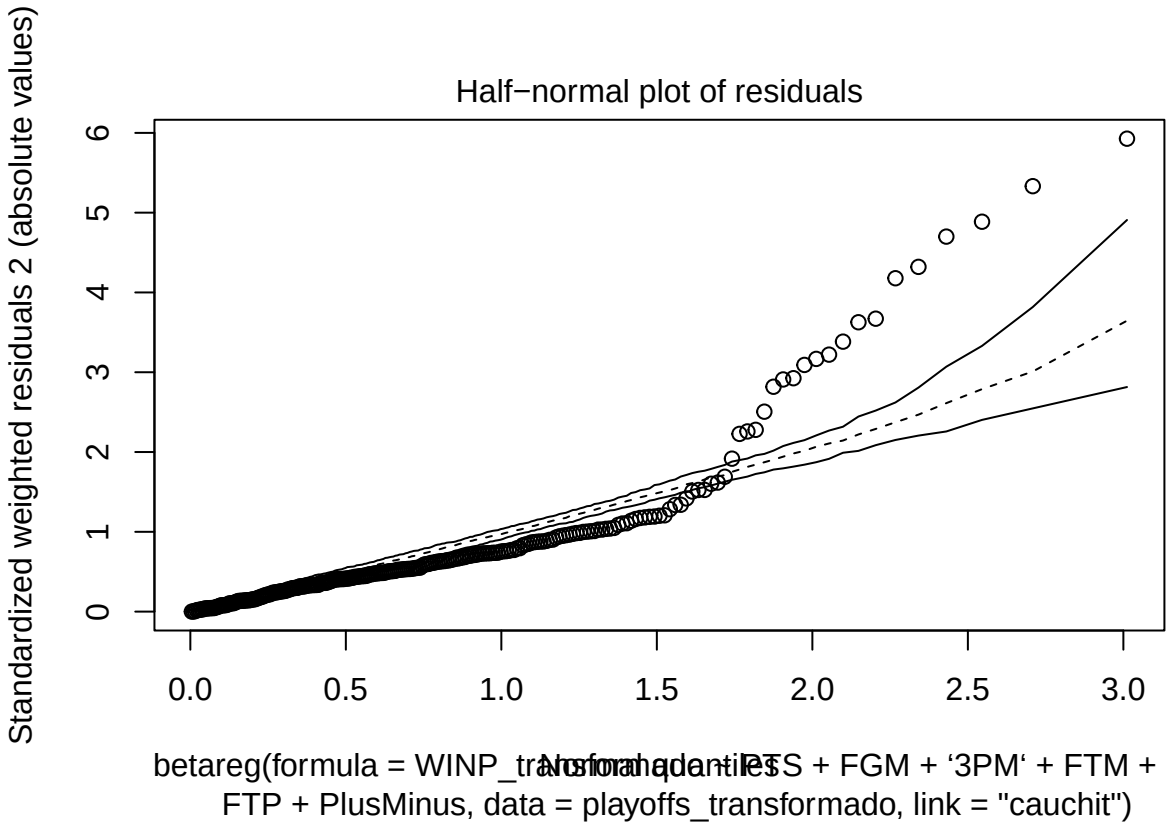

```
plot(modelo_betat_cauchit1, which = 3)
```



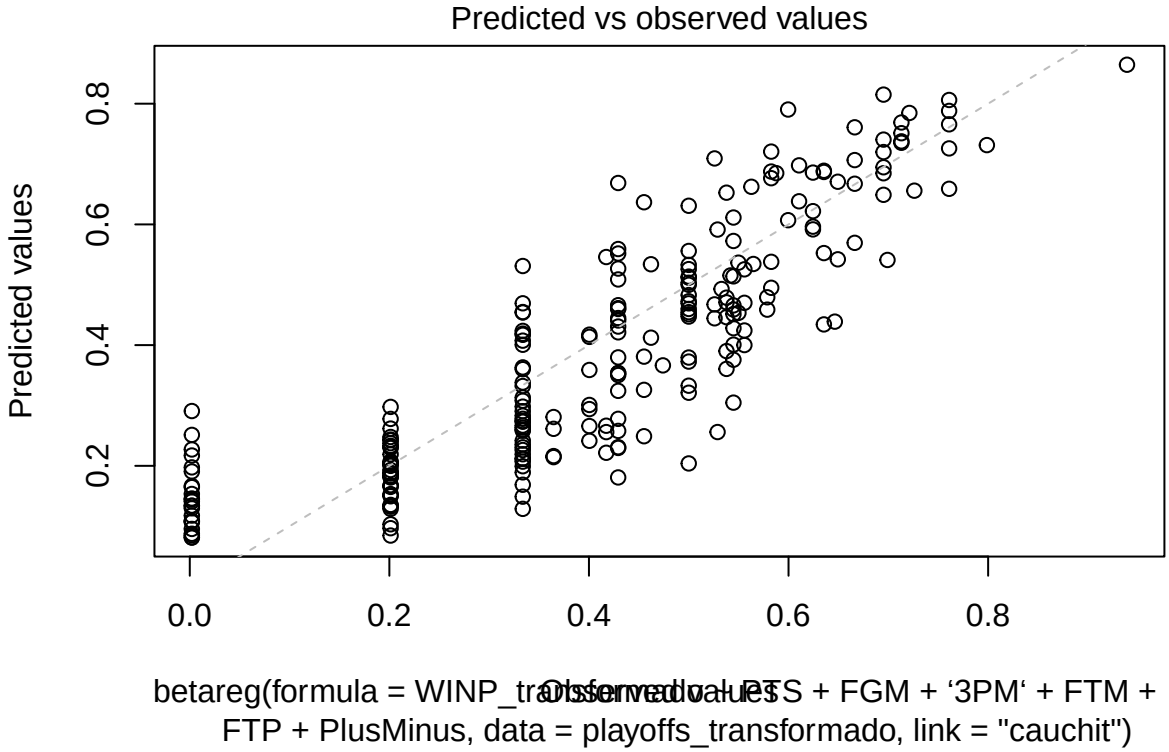

```
plot(modelo_betat_cauchit1, which = 4)
```




```
plot(modelo_betat_cauchit1, which = 5)
```




```
plot(modelo_betat_cauchit1, which = 6)
```



```r
shapiro.test(modelo_betat_cauchit1$residuals) #p-value =
```

```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_betat_cauchit1$residuals
## W = 0.99691, p-value = 0.9228
```

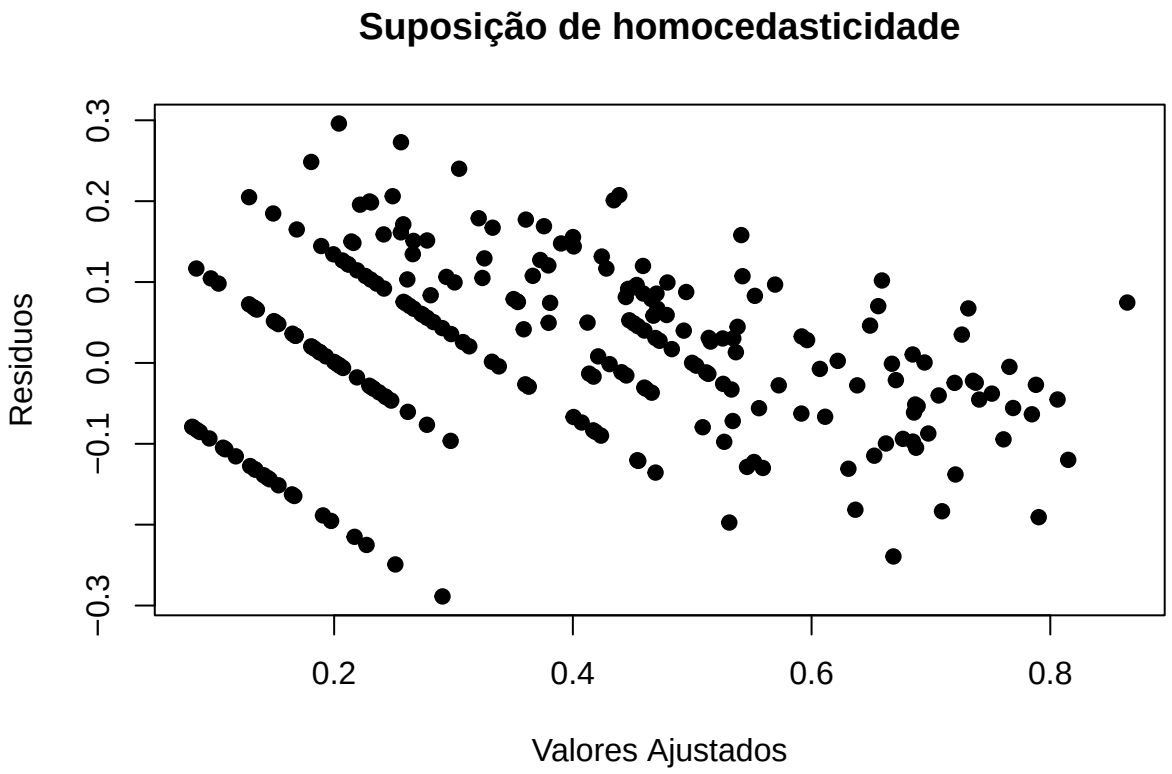
```r
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_betat_cauchit1) #p-value = 0.04034
```

```
##
##  Durbin-Watson test
##
## data:  modelo_betat_cauchit1
## DW = 1.7817, p-value = 0.03736
## alternative hypothesis: true autocorrelation is greater than 0
```

```r
#Independência
plot(modelo_betat_cauchit1$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```


```r
#Homocedasticidade
plot(modelo_betat_cauchit1$fitted.values, modelo_betat_cauchit1$residuals,
     xlab = "Valores Ajustados",
     ylab = "Residuos",
     pch = 19,
```

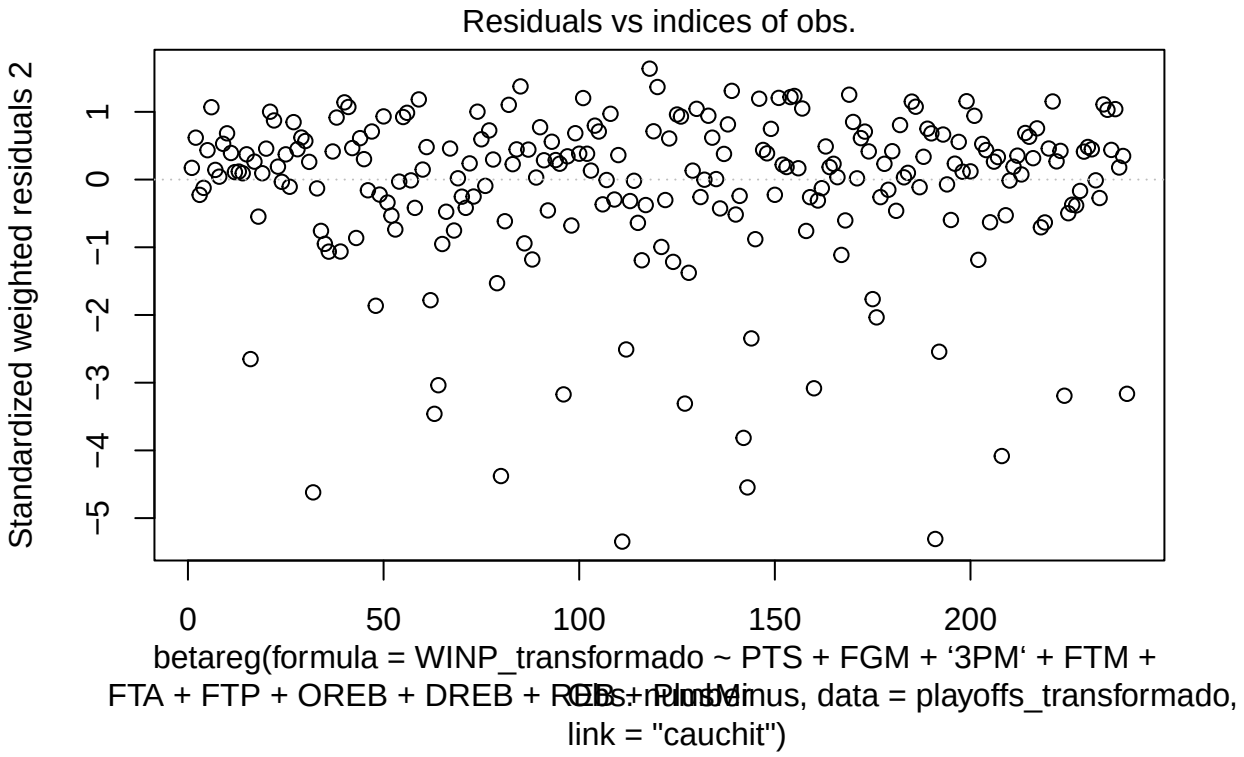
```
     main = "Suposição de homocedasticidade"
)
```



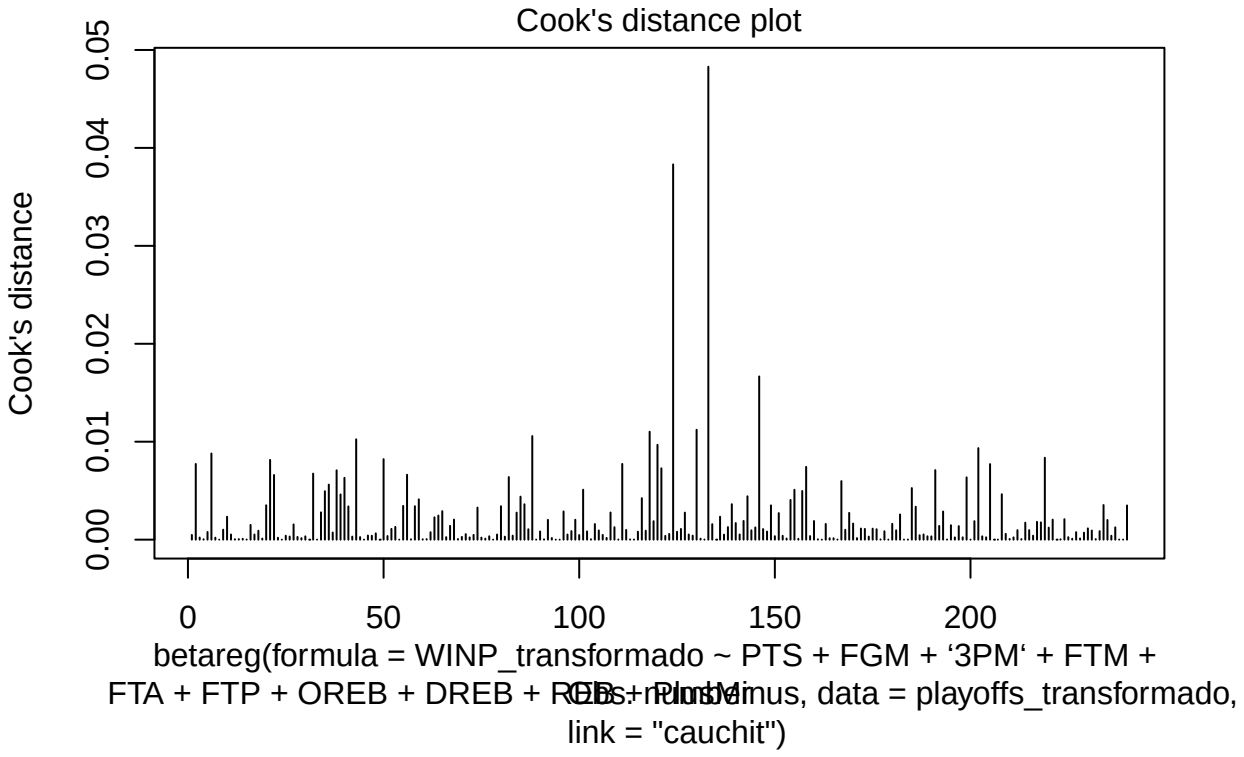

```
#Breusch_Pagan para homocedasticdade
bptest(modelo_betat_cauchit1) #p-value = 0.0007128, heterocedasticidade
```

```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_betat_cauchit1
## BP = 21.104, df = 6, p-value = 0.001757
```

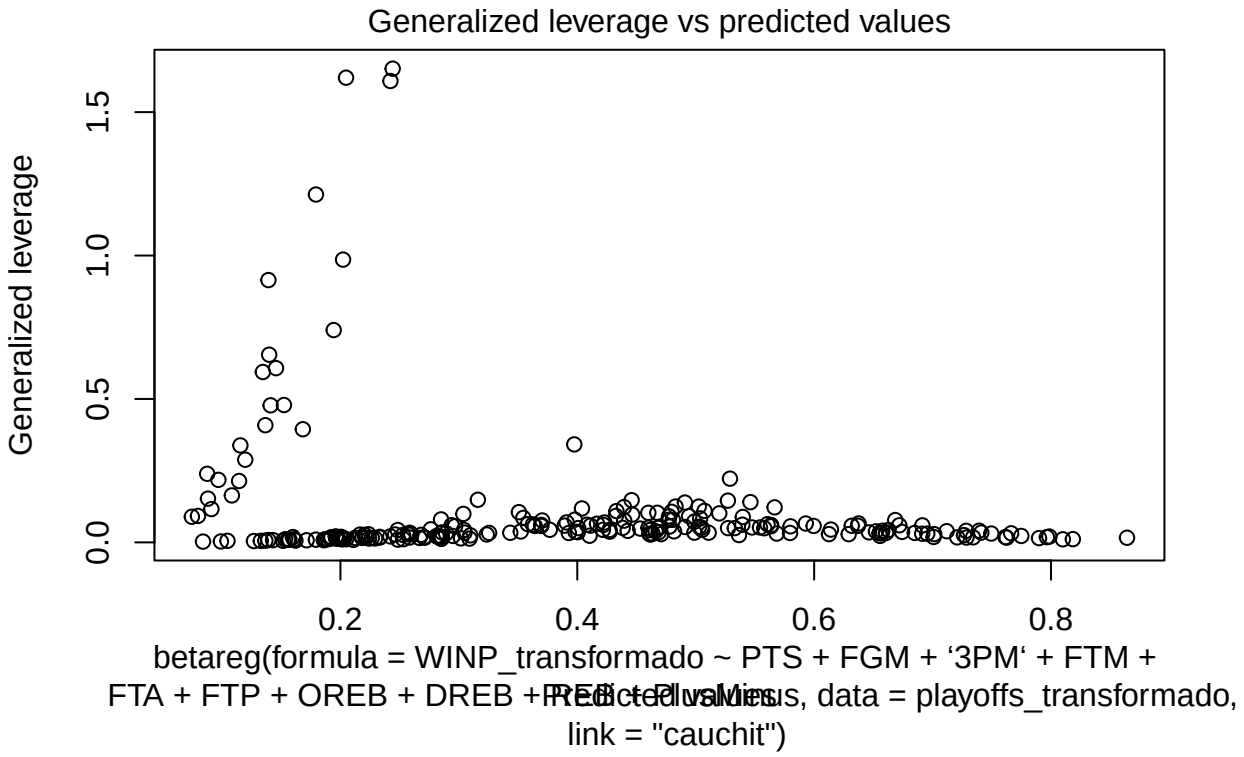
```
#### Modelo 10% ####
plot(modelo_betat_cauchit2, which = 1)
```



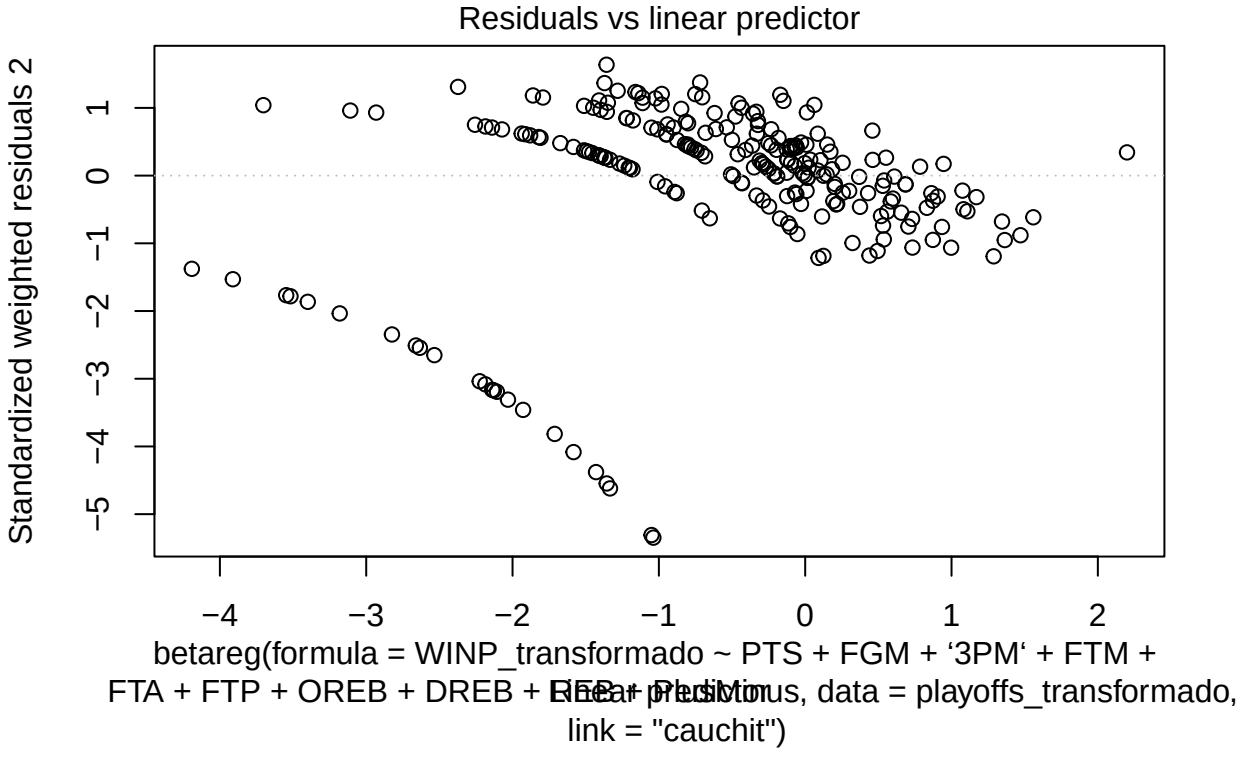

```
plot(modelo_betat_cauchit2, which = 2)
```



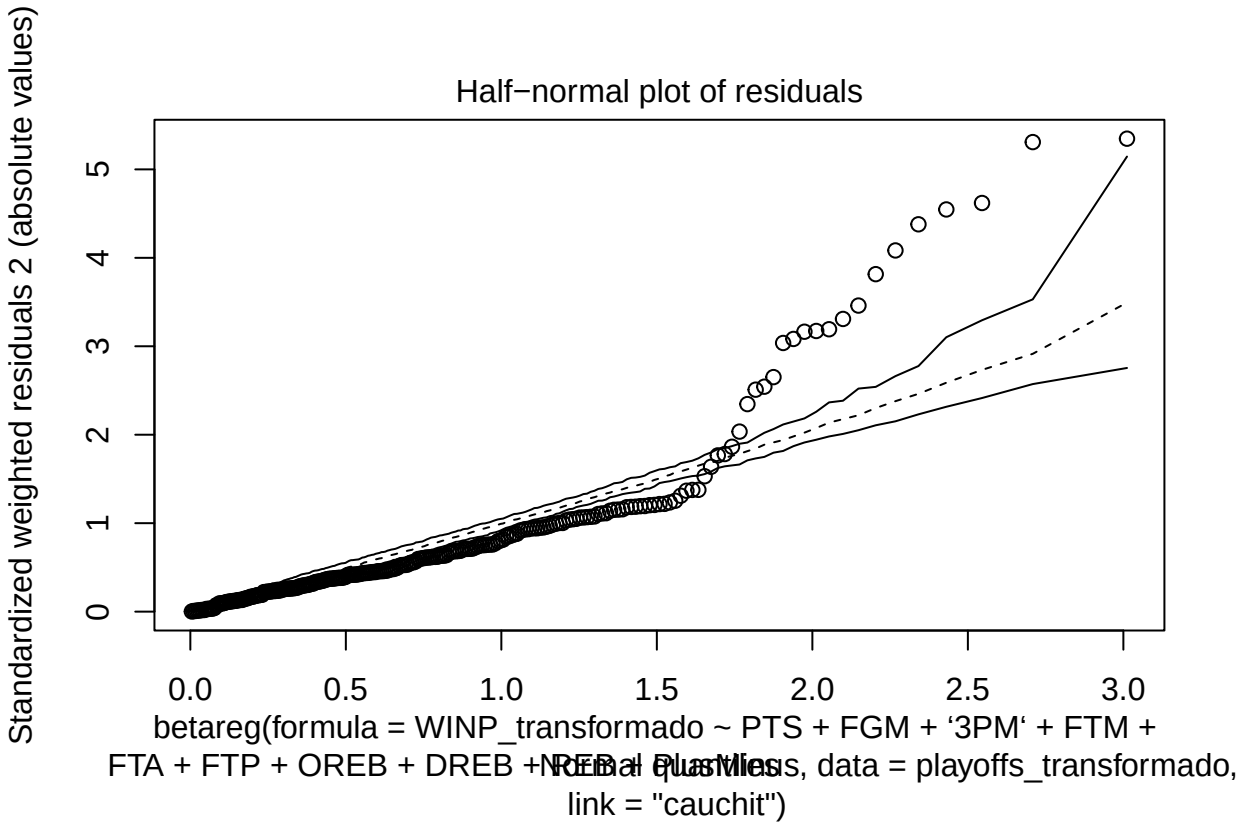

```
plot(modelo_betat_cauchit2, which = 3)
```



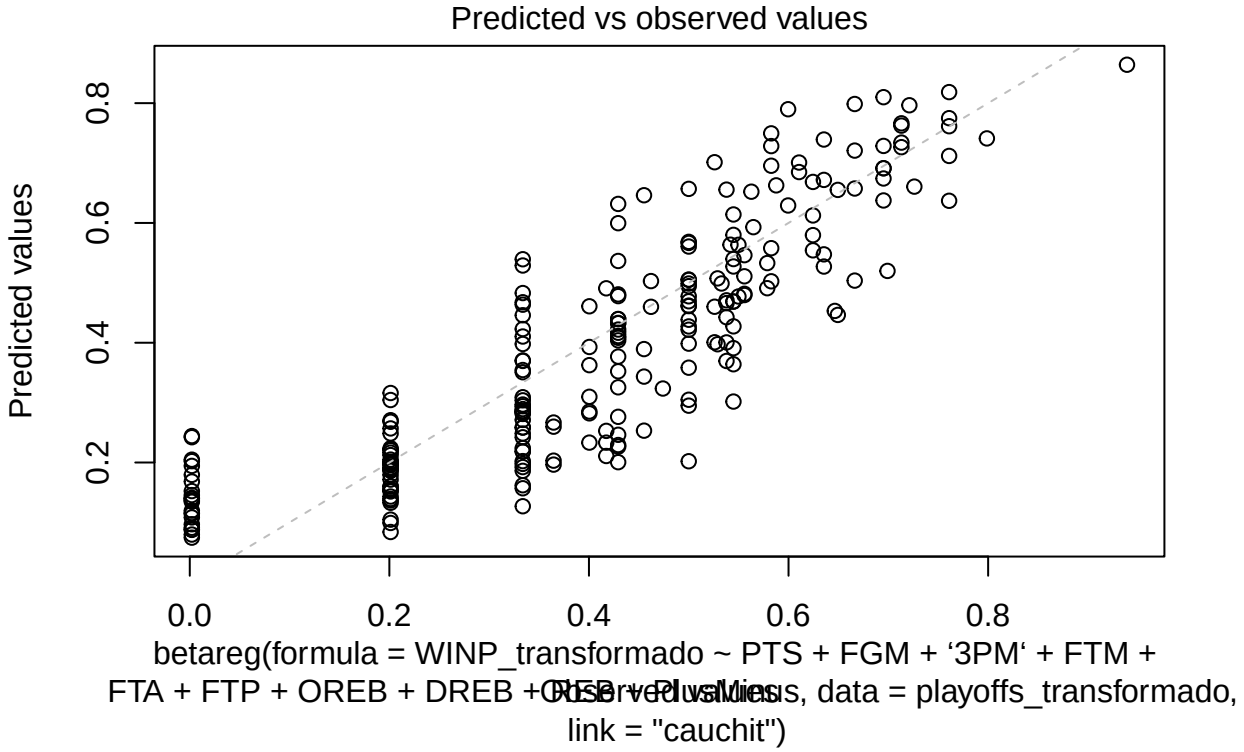

```
plot(modelo_betat_cauchit2, which = 4)
```




```
plot(modelo_betat_cauchit2, which = 5)
```




```
plot(modelo_betat_cauchit2, which = 6)
```



```r
shapiro.test(modelo_betat_cauchit2$residuals) #p-value =
```

```
##
##  Shapiro-Wilk normality test
##
## data:  modelo_betat_cauchit2$residuals
## W = 0.99269, p-value = 0.2836
```

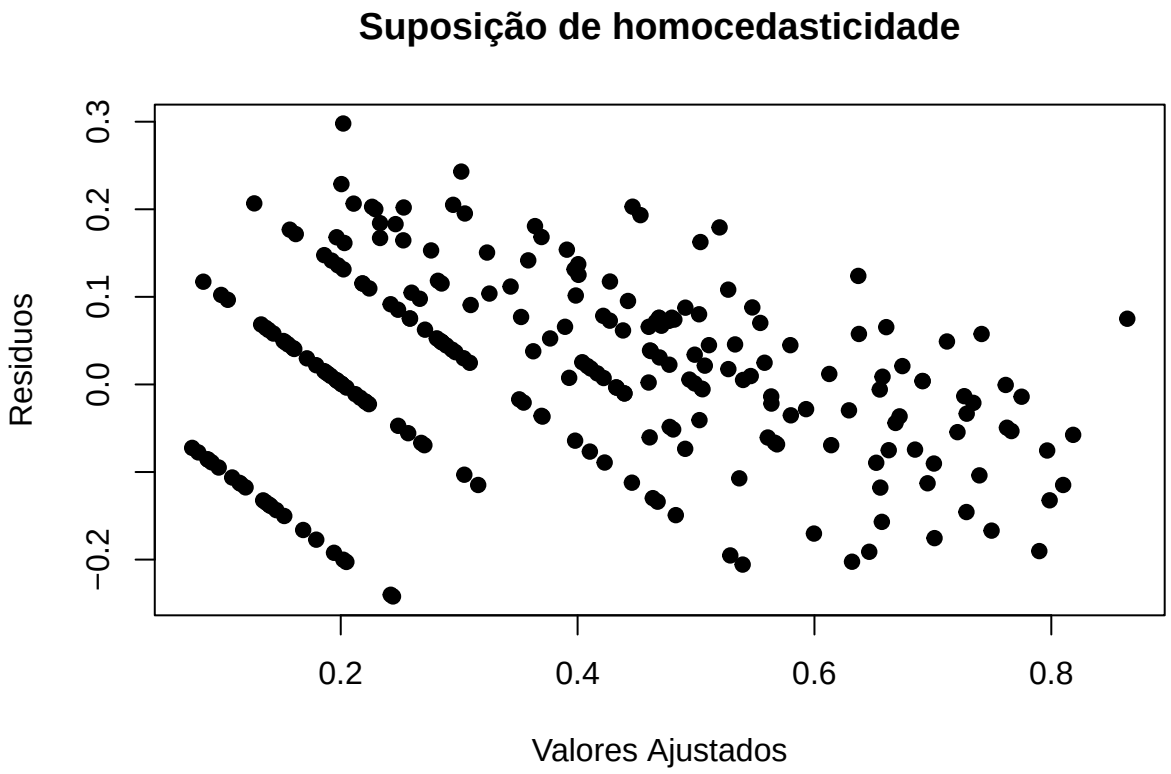
```r
#Teste de durbin watson para independencia
library(lmtest)
dwtest(modelo_betat_cauchit2) #p-value = 0.04034
```

```
##
##  Durbin-Watson test
##
## data:  modelo_betat_cauchit2
## DW = 1.7876, p-value = 0.03917
## alternative hypothesis: true autocorrelation is greater than 0
```

```r
#Independência
plot(modelo_betat_cauchit2$residuals,
     ylab = "Residuos",
     xlab = "Index dos Imovéis",
     main = "Suposição de independência",
     pch = 19)
```


```r
#Homocedasticidade
plot(modelo_betat_cauchit2$fitted.values, modelo_betat_cauchit2$residuals,
     xlab = "Valores Ajustados",
     ylab = "Residuos",
     pch = 19,
```

```
     main = "Suposição de homocedasticidade"
)
```




```
#Breusch_Pagan para homocedasticdade
bptest(modelo_betat_cauchit2) #p-value = 0.0007128, heterocedasticidade
```

```
##
##  studentized Breusch-Pagan test
##
## data:  modelo_betat_cauchit2
## BP = 28.674, df = 10, p-value = 0.001407
```

```
#### Não funcionou e não vai funcionar ####
# completo_regp = betareg(WINP_transformado ~ . ,data = playoffs_transformado)
# vazio_regp = betareg(WINP_transformado ~ 1 ,data = playoffs_transformado)
# step(completo_regp, scope=list(upper=completo_regp, lower=vazio_regp), direction='backward', trace=TR
```