

Parameters 2015-2019 model 0

Rates for the home and away goals

$$\ln \lambda_k = \ln \alpha_i + \ln \beta_j + \ln \gamma_h$$

$$\ln \mu_k = \ln \alpha_i + \ln \beta_j$$

- i : home team index;
- j : away team index;
- α : attack strength parameter;
- $1/\beta$: defense strength parameter;
- γ_h : home advantage parameter.

Constraint

The constraint for identificability is

$$\sum_i^n \log(\alpha_i) = \sum_i^n \log(\beta_i).$$

```
options(knitr.kable.NA = "-")
options(scipen = 999)
```

```
library(dplyr)
library(knitr)
```

```
load("data/input.RData")
load("data/mod_0.RData")
```

```
alphas_betas = tibble(Team = times$Time,
                      alpha = exp(mod_0$alpha),
                      beta = exp(mod_0$beta))
kable(alphas_betas, digits = 4, caption = "Alphas and betas",
      col.names = c("Team", "$\\alpha$", "$\\beta$"))
```

Table 1: Alphas and betas

Team	α	β
América-MG	0.6185	1.0346
Athletico-PR	1.0625	0.7738
Atlético-GO	0.8821	1.1013

Team	α	β
Atlético-MG	1.3047	0.9770
Avaí	0.6653	1.1189
Bahia	1.0307	0.8856
Botafogo	0.9070	0.8570
Ceará	0.7918	0.7916
Chapecoense	0.9152	0.9972
Corinthians	1.1217	0.6953
Coritiba	0.8733	0.8932
Cruzeiro	0.9220	0.8123
Csa	0.5703	1.1426
Figueirense	0.7637	0.9918
Flamengo	1.3393	0.7850
Fluminense	0.9532	0.9579
Fortaleza	1.1777	0.9956
Goiás	1.0047	1.1437
Grêmio	1.1922	0.7222
Internacional	0.9721	0.7400
Joinville	0.6047	0.9569
Palmeiras	1.4158	0.7635
Paraná	0.4281	1.1281
Ponte Preta	0.9689	0.9574
Santa Cruz	1.0577	1.3712
Santos	1.2207	0.7355
São Paulo	1.0588	0.7898
Sport	1.0664	1.0475
Vasco da Gama	0.8638	0.9708
Vitória	1.0707	1.1635

```

Parameter = "$\\gamma_h$"
param = tibble(Parameter,
  Estimative = exp(mod_0$gamma))
kable(param, digits = 4, caption = "Other parameters")

```

Table 2: Other parameters

Parameter	Estimative
γ_h	1.5485

```
mod_0$loglik
```

```
## [1] -3491.928
```