

Parameters 2015-2020 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	0.6157	1.0442
Athletico-PR	1.0321	0.7677
Atlético-GO	0.9153	0.9946

Team	α	β
Atlético-MG	1.3370	0.9724
Avaí	0.6640	1.1335
Bahia	1.0584	0.9616
Botafogo	0.8789	0.9343
Ceará	0.9512	0.8677
Chapecoense	0.9123	1.0088
Corinthians	1.1105	0.7336
Coritiba	0.8415	0.9405
Cruzeiro	0.9193	0.8215
Csa	0.5669	1.1538
Figueirense	0.7631	1.0057
Flamengo	1.3818	0.8227
Fluminense	1.0079	0.9450
Fortaleza	0.9892	0.9243
Goiás	0.9991	1.1806
Grêmio	1.1990	0.7403
Internacional	1.0596	0.7370
Joinville	0.6045	0.9696
Palmeiras	1.3771	0.7642
Paraná	0.4246	1.1322
Ponte Preta	0.9685	0.9714
Red Bull Bragantino	1.1804	0.7855
Santa Cruz	1.0563	1.3915
Santos	1.2216	0.7888
São Paulo	1.1110	0.8012
Sport	1.0003	1.0392
Vasco da Gama	0.8664	1.0024
Vitória	1.0674	1.1766

```

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	1.5039

```
mod_0$loglik
```

```
## [1] -4212.657
```