Parameters 2015-2018 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	0.6077	1.0463
Athletico-PR	1.0186	0.8120
Atlético-GO	0.8673	1.1054

Team	α	β
Atlético-MG	1.3451	0.9833
Avaí	0.7708	1.0793
Bahia	1.0141	0.9023
Botafogo	0.9497	0.8521
Ceará	0.7313	0.7742
Chapecoense	0.9465	0.9978
Corinthians	1.1417	0.7049
Coritiba	0.8612	0.9006
Cruzeiro	0.9780	0.7951
Figueirense	0.7542	1.0022
Flamengo	1.1588	0.7924
Fluminense	0.9541	0.9762
Goiás	0.9020	1.0037
Grêmio	1.1025	0.7085
Internacional	0.9416	0.7329
Joinville	0.6000	0.9679
Palmeiras	1.3966	0.7972
Paraná	0.4205	1.1428
Ponte Preta	0.9554	0.9653
Santa Cruz	1.0394	1.3842
Santos	1.1620	0.7568
São Paulo	1.0829	0.8453
Sport	1.0505	1.0574
Vasco da Gama	0.8353	1.0031
Vitória	1.0522	1.1736

```
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	1.5618

```
mod_0$loglik
```

```
## [1] -2801.353
```