Trabalho_Final_ML

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Pacotes necessários:

```
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --

## v ggplot2 3.4.4     v purrr   1.0.1
## v tibble  3.2.1     v dplyr   1.1.2
## v tidyr   1.2.0     v stringr 1.4.0
## v readr   2.1.2     v forcats 0.5.1

## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(sidrar)
library(readr)
library(rbcb)
```

1)

a) Baixando e modelando a base de dados

```
inf <- get_sidra(1737,variable = 63, period = "201201-202405")
```

```
## Considering all categories once 'classific' was set to 'all' (default)
```

```
inf <- inf %>% select("Mês (Código)", "Valor")

colnames(inf) <- c("date", "inf")

inf$date <- as.Date(paste0(str_sub(inf$date, end = 4),"-",
str_sub(inf$date, start = 5),"-01"))
```

```
dim(inf)
```

```
## [1] 149   2
```

```
head(inf)
```

```
##         date  inf
## 2 2012-01-01 0.56
## 3 2012-02-01 0.45
## 4 2012-03-01 0.21
## 5 2012-04-01 0.64
## 6 2012-05-01 0.36
## 7 2012-06-01 0.08
```

```
tail(inf)
```

```
##           date  inf
## 145 2023-12-01 0.56
## 146 2024-01-01 0.42
## 147 2024-02-01 0.83
## 148 2024-03-01 0.16
## 149 2024-04-01 0.38
## 150 2024-05-01 0.46
```

2) Gerando estatísticas descritivas:

```
mean(inf$inf)
```

```
## [1] 0.4787248
```

```
median(inf$inf)
```

```
## [1] 0.44
```

```
min(inf$inf)
```

```
## [1] -0.68
```

```
max(inf$inf)
```

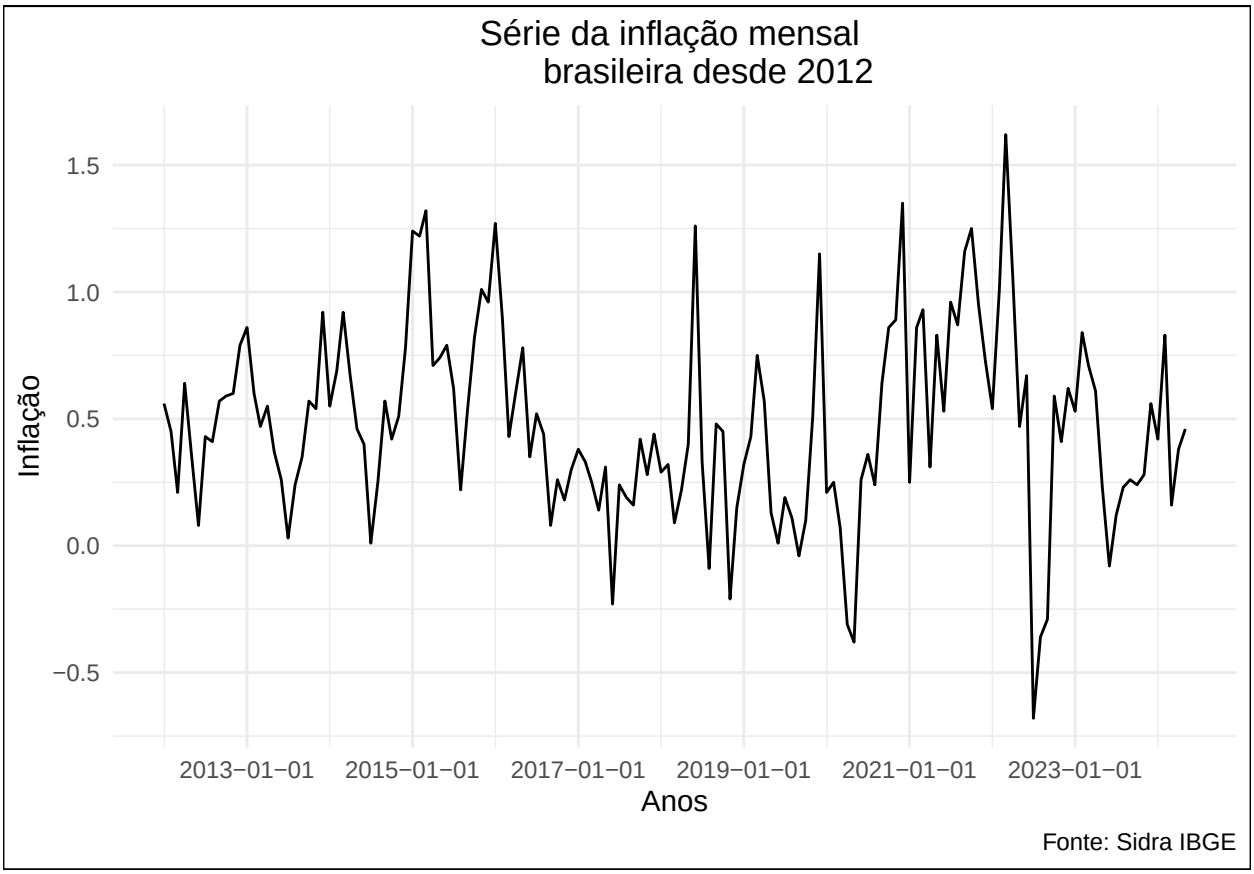
```
## [1] 1.62
```

```
sd(inf$inf)
```

```
## [1] 0.3780288
```

Gerando o gráfico da série histórica da inflação:

```r
ggplot(data = inf) +
  geom_line(aes(x = date, y = inf)) +
  labs(x = "Anos", y = "Inflação",title = "Série da inflação mensal
       brasileira desde 2012", caption = "Fonte: Sidra IBGE") +
  theme_minimal() +
  scale_y_continuous(breaks = seq(-1, 2, by = 0.5)) +
  scale_x_date(date_breaks = "2 years") +
  theme(plot.title = element_text(hjust = 0.5),
        plot.subtitle = element_text(hjust = 0.5),
        plot.background = element_rect(fill = "white"))
```



Observamos que a inflação brasileira variou em torno de sua média de aproximadamente 0.5% ao mês desde jan 2012 até maio 2024, tendo seu período de maior volatilidade ao longo de 2022.

3)

Baixando as variáveis:

3.1) ipca

```r
index <- list(433)
ipca <- get_series(index, start_date = "2011-12-01", end_date = "2024-04-30",
                   as = c("data.frame"))
colnames(ipca)[2] <- "ipca"
```

3.2) igpm

```
index <- list(189)
igpm <- get_series(index, start_date = "2011-12-01", end_date = "2024-04-30",
                   as = "data.frame")
colnames(igpm)[2] <- "igpm"
```

3.3) ipca15

```
index <- list(7478)
ipca15 <- get_series(index, start_date = "2011-12-01", end_date = "2024-04-30", as = "data.frame")
colnames(ipca15)[2] <- "ipca15"
```

3.4) bm_broad

```
index <- list(1833)
bm_broad <- get_series(index, start_date = "2011-10-01", end_date = "2024-03-31",
                       as = "data.frame")

colnames(bm_broad)[2] <- "bm_broad_old"
bm_broad$bm_broad <- rep(NA, nrow(bm_broad))

for (t in 2:nrow(bm_broad)) {
bm_broad$bm_broad[t] <- ((bm_broad$bm_broad_old[t] - bm_broad$bm_broad_old[t-1])/bm_broad$bm_broad_old[t
}

bm_broad <- bm_broad[-1, ]
bm_broad <- bm_broad %>% select(date, bm_broad)
```

3.5) m1

```
index <- list(27788)
m1 <- get_series(index, start_date = "2011-10-01", end_date = "2024-03-01", as = "data.frame")

# coluna a partir da qual computaremos a variação percentual
colnames(m1)[2] <- "m1_old"
# coluna que receberá o resultado da variação percentual
m1$m1 <- rep(NA, nrow(m1))
# calculamos a variação percentual a partir da segunda linha
for (t in 2:nrow(m1)) {
m1$m1[t] <- ((m1$m1_old[t] - m1$m1_old[t-1])/m1$m1_old[t-1])*100
}

m1 <- m1[-1, ]
m1 <- m1 %>% select(date, m1)
```

3.6) icbr

```
index <- list(27574)
icbr <- get_series(index, start_date = "2011-11-01", end_date = "2024-04-30", as = "data.frame")

# coluna a partir da qual computaremos a variação percentual
colnames(icbr)[2] <- "icbr_old"
# coluna que receberá o resultado da variação percentual
```

```
icbr$icbr <- rep(NA, nrow(icbr))
# calculamos a variação percentual a partir da segunda linha
for (t in 2:nrow(icbr)) {
icbr$icbr[t] <- ((icbr$icbr_old[t] - icbr$icbr_old[t-1])/icbr$icbr_old[t-1])*100
}

icbr <- icbr[-1, ]
icbr <- icbr %>% select(date, icbr)
```

3.7) ibcbr

```
index <- list(24363)
ibcbr <- get_series(index, start_date = "2011-09-01", end_date = "2024-02-29", as = "data.frame")

# coluna a partir da qual computaremos a variação percentual
colnames(ibcbr)[2] <- "ibcbr_old"
# coluna que receberá o resultado da variação percentual
ibcbr$ibcbr <- rep(NA, nrow(ibcbr))
# calculamos a variação percentual a partir da segunda linha
for (t in 2:nrow(ibcbr)) {
ibcbr$ibcbr[t] <- ((ibcbr$ibcbr_old[t] - ibcbr$ibcbr_old[t-1])/ibcbr$ibcbr_old[t-1])*100
}

ibcbr <- ibcbr[-1, ]
ibcbr <- ibcbr %>% select(date, ibcbr)
```

3.8) pimpf

```
index <- list(21859)
pimpf <- get_series(index, start_date = "2011-10-01", end_date = "2024-03-31", as = "data.frame")

# coluna a partir da qual computaremos a variação percentual
colnames(pimpf)[2] <- "pimpf_old"
pimpf$pimpf <- rep(NA, nrow(pimpf))

for (t in 2:nrow(pimpf)) {
pimpf$pimpf[t] <- ((pimpf$pimpf_old[t] - pimpf$pimpf_old[t-1])/pimpf$pimpf_old[t-1])*100
}

pimpf <- pimpf[-1, ]
pimpf <- pimpf %>% select(date, pimpf)
```

3.9) tcu

```
index <- list(24352)
tcu <- get_series(index, start_date = "2011-11-01", end_date = "2024-04-30", as = "data.frame")

# coluna a partir da qual computaremos a variação percentual
colnames(tcu)[2] <- "tcu_old"
tcu$tcu <- rep(NA, nrow(tcu))

for (t in 2:nrow(tcu)) {
```

```
tcu$tcu[t] <- (tcu$tcu_old[t] - tcu$tcu_old[t-1])
}

tcu <- tcu[-1, ]
tcu <- tcu %>% select(date, tcu)
```

3.10) aggreg_wage

```
index <- list(22078)
aggreg_wage <- get_series(index, start_date = "2011-10-01", end_date = "2024-03-01",
                          as = "data.frame")

# coluna a partir da qual computaremos a variação percentual
colnames(aggreg_wage)[2] <- "aggreg_wage_old"
# coluna que receberá o resultado da variação percentual
aggreg_wage$aggreg_wage <- rep(NA, nrow(aggreg_wage))
# calculamos a variação percentual a partir da segunda linha
for (t in 2:nrow(aggreg_wage)) {
aggreg_wage$aggreg_wage[t] <- ((aggreg_wage$aggreg_wage_old[t] -
                                  aggreg_wage$aggreg_wage_old[t-1])/ aggreg_wage$aggreg_wage_old[t-1])*
}

aggreg_wage <- aggreg_wage[-1, ]
aggreg_wage <- aggreg_wage %>% select(date, aggreg_wage)
```

3.11) elec

```
index <- list(1406)
elec <- get_series(index, start_date = "2011-10-01", end_date = "2024-03-31",
                   as = "data.frame")

colnames(elec)[2] <- "elec_old"

elec$elec <- rep(NA, nrow(elec))

for (t in 2:nrow(elec)) {
  elec$elec[t] <- ((elec$elec_old[t] - elec$elec_old[t-1]) / elec$elec_old[t-1]) * 100
}

elec <- elec[-1, ]

elec <- elec %>% select(date, elec)
```

3.12) confidence

```
index <- list(4393)
confidence <- get_series(index, start_date = "2011-11-01", end_date = "2024-04-30", as = "data.frame")

colnames(confidence)[2] <- "confidence_old"
confidence$confidence <- rep(NA, nrow(confidence))

for (t in 2:nrow(confidence)) {
```

```
  confidence$confidence[t] <-
    ((confidence$confidence_old[t] - confidence$confidence_old[t-1])/confidence$confidence_old[t-1]) * 1
}

confidence <- confidence[-1, ]
confidence <- confidence %>% select(date, confidence)
```

3.13) brl_usd

```
index <- list(3695)
brl_usd <- get_series(index, start_date = "2011-11-01", end_date = "2024-04-30", as = "data.frame")

colnames(brl_usd)[2] <- "brl_usd_old"
brl_usd$brl_usd <- rep(NA, nrow(brl_usd))

for (t in 2:nrow(brl_usd)) {
  brl_usd$brl_usd[t] <- ((brl_usd$brl_usd_old[t] - brl_usd$brl_usd_old[t-1])
                         / brl_usd$brl_usd_old[t-1]) * 100
}

brl_usd <- brl_usd[-1, ]
brl_usd <- brl_usd %>% select(date, brl_usd)
```

3.14) selic

```
index <- list(4390)
selic <- get_series(index, start_date = "2011-12-01", end_date = "2024-04-30", as = "data.frame")
colnames(selic)[2] <- "selic"
```

3.15) saving

```
index <- list(1835)
saving <- get_series(index, start_date = "2011-10-01", end_date = "2024-03-31", as = "data.frame")

colnames(saving)[2] <- "saving_old"
saving$saving <- rep(NA, nrow(saving))

for (t in 2:nrow(saving)) {
  saving$saving[t] <- ((saving$saving_old[t] - saving$saving_old[t-1])
                       / saving$saving_old[t-1]) * 100
}

saving <- saving[-1, ]
saving <- saving %>% select(date, saving)
```

3.16) cred

```
index <- list(20539)
cred <- get_series(index, start_date = "2011-10-01", end_date = "2024-03-31", as = "data.frame")

colnames(cred)[2] <- "cred_old"
cred$cred <- rep(NA, nrow(cred))
```

```
for (t in 2:nrow(cred)) {
  cred$cred[t] <- ((cred$cred_old[t] - cred$cred_old[t-1])
                   / cred$cred_old[t-1]) * 100
}

cred <- cred[-1, ]
cred <- cred %>% select(date, cred)
```

3.17) net_debt_gdp

```
index <- list(4513)
net_debt_gdp <- get_series(index, start_date = "2011-10-01", end_date = "2024-03-31", as = "data.frame")

colnames(net_debt_gdp)[2] <- "net_debt_gdp_old"
net_debt_gdp$net_debt_gdp <- rep(NA, nrow(net_debt_gdp))

for (t in 2:nrow(net_debt_gdp)) {
 net_debt_gdp$net_debt_gdp[t] <- (net_debt_gdp$net_debt_gdp_old[t]
                                  - net_debt_gdp$net_debt_gdp_old[t-1])
}

net_debt_gdp <- net_debt_gdp[-1, ]
net_debt_gdp <- net_debt_gdp %>% select(date, net_debt_gdp)
```

3.18) primary

```
index <- list(4649)

primary <- get_series(index, start_date = "2011-10-01", end_date = "2024-03-31", as = "data.frame")

colnames(primary)[2] <- "primary_old"
primary$primary <- rep(NA, nrow(primary))

for (t in 2:nrow(primary)) {
  primary$primary[t] <- (primary$primary_old[t] - primary$primary_old[t-1])
}

primary <- primary[-1, ]
primary <- primary %>% select(date, primary)
```

3.19) current_account

```
index <- list(22701)
current_account <- get_series(index, start_date = "2011-10-01", end_date = "2024-03-01", as = "data.fra

colnames(current_account)[2] <- "current_account_old"
current_account$current_account <- rep(NA, nrow(current_account))

for (t in 2:nrow(current_account)) {
  current_account$current_account[t] <-
    (current_account$current_account_old[t] - current_account$current_account_old[t-1])
}
```

```
current_account <- current_account[-1, ]
current_account <- current_account %>% select(date, current_account)
```

3.20) trade_balance

```
index <- list(22704)
trade_balance <- get_series(index, start_date = "2011-10-01", end_date = "2024-03-31", as = "data.frame

colnames(trade_balance)[2] <- "trade_balance_old"
trade_balance$trade_balance <- rep(NA, nrow(trade_balance))

for (t in 2:nrow(trade_balance)) {
  trade_balance$trade_balance[t] <-
    ((trade_balance$trade_balance_old[t] -
        trade_balance$trade_balance_old[t-1]) / trade_balance$trade_balance_old[t-1]) * 100
}

trade_balance <- trade_balance[-1, ]
trade_balance <- trade_balance %>% select(date, trade_balance)
```

3.21) imports

```
index <- list(22709)
imports <- get_series(index, start_date = "2011-10-01", end_date = "2024-03-31", as = "data.frame")

colnames(imports)[2] <- "imports_old"
imports$imports <- rep(NA, nrow(imports))

for (t in 2:nrow(imports)) {
  imports$imports[t] <- ((imports$imports_old[t] -
                            imports$imports_old[t-1]) / imports$imports_old[t-1]) * 100
}

imports <- imports[-1, ]
imports <- imports %>% select(date, imports)
```

4) Retiramos a variável de salário médio por conta de falta de dados recentes

```
X = cbind(ipca,
igpm,
ipca15,
bm_broad,
m1,
icbr,
ibcbr,
pimpf,
tcu,
#'aggreg_wage',
elec,
confidence,
brl_usd,
```

```
selic,
saving,
cred,
net_debt_gdp,
primary,
current_account,
trade_balance,
imports)

print(X)
```

```
##           date  ipca       date  igpm       date ipca15       date    bm_broad
## 2   2011-12-01  0.50 2011-12-01 -0.12 2011-12-01   0.56 2011-11-01  0.19196047
## 3   2012-01-01  0.56 2012-01-01  0.25 2012-01-01   0.65 2011-12-01  0.82774563
## 4   2012-02-01  0.45 2012-02-01 -0.06 2012-02-01   0.53 2012-01-01  1.46996853
## 5   2012-03-01  0.21 2012-03-01  0.43 2012-03-01   0.25 2012-02-01  0.12063843
## 6   2012-04-01  0.64 2012-04-01  0.85 2012-04-01   0.43 2012-03-01  1.19837492
## 7   2012-05-01  0.36 2012-05-01  1.02 2012-05-01   0.51 2012-04-01  0.85801558
## 8   2012-06-01  0.08 2012-06-01  0.66 2012-06-01   0.18 2012-05-01  0.37675927
## 9   2012-07-01  0.43 2012-07-01  1.34 2012-07-01   0.33 2012-06-01  1.02782992
## 10  2012-08-01  0.41 2012-08-01  1.43 2012-08-01   0.39 2012-07-01  0.60619146
## 11  2012-09-01  0.57 2012-09-01  0.97 2012-09-01   0.48 2012-08-01  0.37923260
## 12  2012-10-01  0.59 2012-10-01  0.02 2012-10-01   0.65 2012-09-01  1.28519844
## 13  2012-11-01  0.60 2012-11-01 -0.03 2012-11-01   0.54 2012-10-01  1.24713023
## 14  2012-12-01  0.79 2012-12-01  0.68 2012-12-01   0.69 2012-11-01  0.54858463
## 15  2013-01-01  0.86 2013-01-01  0.34 2013-01-01   0.88 2012-12-01 -0.60340224
## 16  2013-02-01  0.60 2013-02-01  0.29 2013-02-01   0.68 2013-01-01  1.08474727
## 17  2013-03-01  0.47 2013-03-01  0.21 2013-03-01   0.49 2013-02-01  0.18270082
## 18  2013-04-01  0.55 2013-04-01  0.15 2013-04-01   0.51 2013-03-01  0.76281025
## 19  2013-05-01  0.37 2013-05-01  0.00 2013-05-01   0.46 2013-04-01  0.71046044
## 20  2013-06-01  0.26 2013-06-01  0.75 2013-06-01   0.38 2013-05-01  0.23192304
## 21  2013-07-01  0.03 2013-07-01  0.26 2013-07-01   0.07 2013-06-01  0.71865314
## 22  2013-08-01  0.24 2013-08-01  0.15 2013-08-01   0.16 2013-07-01  0.72594713
## 23  2013-09-01  0.35 2013-09-01  1.50 2013-09-01   0.27 2013-08-01  0.50373721
## 24  2013-10-01  0.57 2013-10-01  0.86 2013-10-01   0.48 2013-09-01  0.63753624
## 25  2013-11-01  0.54 2013-11-01  0.29 2013-11-01   0.57 2013-10-01  0.48239420
## 26  2013-12-01  0.92 2013-12-01  0.60 2013-12-01   0.75 2013-11-01 -0.09243554
## 27  2014-01-01  0.55 2014-01-01  0.48 2014-01-01   0.67 2013-12-01  0.07352534
## 28  2014-02-01  0.69 2014-02-01  0.38 2014-02-01   0.70 2014-01-01  1.97055206
## 29  2014-03-01  0.92 2014-03-01  1.67 2014-03-01   0.73 2014-02-01 -0.13819716
## 30  2014-04-01  0.67 2014-04-01  0.78 2014-04-01   0.78 2014-03-01  0.82795816
## 31  2014-05-01  0.46 2014-05-01 -0.13 2014-05-01   0.58 2014-04-01  0.60673267
## 32  2014-06-01  0.40 2014-06-01 -0.74 2014-06-01   0.47 2014-05-01  0.75218729
## 33  2014-07-01  0.01 2014-07-01 -0.61 2014-07-01   0.17 2014-06-01  1.88342320
## 34  2014-08-01  0.25 2014-08-01 -0.27 2014-08-01   0.14 2014-07-01  1.48754566
## 35  2014-09-01  0.57 2014-09-01  0.20 2014-09-01   0.39 2014-08-01  0.22339327
## 36  2014-10-01  0.42 2014-10-01  0.28 2014-10-01   0.48 2014-09-01  1.96853406
## 37  2014-11-01  0.51 2014-11-01  0.98 2014-11-01   0.38 2014-10-01  0.77631142
## 38  2014-12-01  0.78 2014-12-01  0.62 2014-12-01   0.79 2014-11-01  1.06696373
## 39  2015-01-01  1.24 2015-01-01  0.76 2015-01-01   0.89 2014-12-01  1.02052197
## 40  2015-02-01  1.22 2015-02-01  0.27 2015-02-01   1.33 2015-01-01  1.15943946
## 41  2015-03-01  1.32 2015-03-01  0.98 2015-03-01   1.24 2015-02-01  1.47563490
## 42  2015-04-01  0.71 2015-04-01  1.17 2015-04-01   1.07 2015-03-01  2.02809125
```

```
## 43  2015-05-01  0.74 2015-05-01  0.41 2015-05-01   0.60 2015-04-01 -0.12196174
## 44  2015-06-01  0.79 2015-06-01  0.67 2015-06-01   0.99 2015-05-01  1.78740323
## 45  2015-07-01  0.62 2015-07-01  0.69 2015-07-01   0.59 2015-06-01  1.11827763
## 46  2015-08-01  0.22 2015-08-01  0.28 2015-08-01   0.43 2015-07-01  2.13109101
## 47  2015-09-01  0.54 2015-09-01  0.95 2015-09-01   0.39 2015-08-01  1.47729312
## 48  2015-10-01  0.82 2015-10-01  1.89 2015-10-01   0.66 2015-09-01  1.23806234
## 49  2015-11-01  1.01 2015-11-01  1.52 2015-11-01   0.85 2015-10-01  0.90687576
## 50  2015-12-01  0.96 2015-12-01  0.49 2015-12-01   1.18 2015-11-01  0.86847498
## 51  2016-01-01  1.27 2016-01-01  1.14 2016-01-01   0.92 2015-12-01  2.18426389
## 52  2016-02-01  0.90 2016-02-01  1.29 2016-02-01   1.42 2016-01-01  1.39592161
## 53  2016-03-01  0.43 2016-03-01  0.51 2016-03-01   0.43 2016-02-01  0.85337320
## 54  2016-04-01  0.61 2016-04-01  0.33 2016-04-01   0.51 2016-03-01 -0.17309551
## 55  2016-05-01  0.78 2016-05-01  0.82 2016-05-01   0.86 2016-04-01  0.84141354
## 56  2016-06-01  0.35 2016-06-01  1.69 2016-06-01   0.40 2016-05-01  1.56075161
## 57  2016-07-01  0.52 2016-07-01  0.18 2016-07-01   0.54 2016-06-01  0.85162277
## 58  2016-08-01  0.44 2016-08-01  0.15 2016-08-01   0.45 2016-07-01  2.27423367
## 59  2016-09-01  0.08 2016-09-01  0.20 2016-09-01   0.23 2016-08-01  1.22769960
## 60  2016-10-01  0.26 2016-10-01  0.16 2016-10-01   0.19 2016-09-01  1.54177609
## 61  2016-11-01  0.18 2016-11-01 -0.03 2016-11-01   0.26 2016-10-01  0.07789160
## 62  2016-12-01  0.30 2016-12-01  0.54 2016-12-01   0.19 2016-11-01  1.53695415
## 63  2017-01-01  0.38 2017-01-01  0.64 2017-01-01   0.31 2016-12-01 -0.19782394
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## 130   -6045.86 2022-07-01        -5928.9 2022-07-01   -70.1958522 2022-07-01
## 131   50719.65 2022-08-01        -1493.0 2022-08-01  -228.6190579 2022-08-01
## 132  -41024.97 2022-09-01           41.6 2022-09-01   -13.9058450 2022-09-01
## 133  -16348.82 2022-10-01         1909.9 2022-10-01    51.2043512 2022-10-01
## 134   47183.81 2022-11-01         4116.3 2022-11-01  -230.9031346 2022-11-01
## 135   -8275.80 2022-12-01        -6438.1 2022-12-01  -131.9937190 2022-12-01
## 136 -110826.09 2023-01-01        -1433.7 2023-01-01   131.8865031 2023-01-01
## 137  125465.73 2023-02-01         4608.6 2023-02-01  -106.5083670 2023-02-01
## 138  -12270.55 2023-03-01         5052.2 2023-03-01  6197.0528455 2023-03-01
## 139  -34506.97 2023-04-01         -944.8 2023-04-01   -31.6688992 2023-04-01
## 140   70496.76 2023-05-01         1340.4 2023-05-01    44.5347189 2023-05-01
## 141   -1273.68 2023-06-01        -1935.3 2023-06-01   -24.4051899 2023-06-01
## 142  -13089.23 2023-07-01        -4381.2 2023-07-01   -23.6116815 2023-07-01
## 143  -12979.28 2023-08-01         3229.0 2023-08-01    36.5414002 2023-08-01
## 144   -4759.03 2023-09-01         1818.3 2023-09-01   -13.1416965 2023-09-01
## 145  -32869.52 2023-10-01         -373.0 2023-10-01    -3.3929850 2023-10-01
## 146   52068.20 2023-11-01        -1906.9 2023-11-01   -22.5622407 2023-11-01
## 147   92303.07 2023-12-01        -5357.5 2023-12-01    11.3099225 2023-12-01
## 148 -231719.15 2024-01-01         2415.2 2024-01-01   -78.1770251 2024-01-01
## 149  150838.12 2024-02-01          808.4 2024-02-01  -158.1932773 2024-02-01
## 150  -49868.77 2024-03-01         -248.1 2024-03-01  -352.7527076 2024-03-01
##         imports
## 2     7.3425958
## 3   -13.4834566
## 4    -4.7859610
## 5    -6.4635734
## 6    15.7112372
```

```
## 7    -0.9447098
## 8     8.3049993
## 9    -8.3993692
## 10   -2.2135250
## 11    5.5010607
## 12   -8.8057714
## 13   15.8289858
## 14    2.1720678
## 15  -15.2500456
## 16   14.0765504
## 17  -15.8025709
## 18   13.6496906
## 19   12.9311553
## 20   -2.6167133
## 21  -10.5333459
## 22   20.4871461
## 23  -10.9467702
## 24   -6.5019225
## 25   21.8487395
## 26  -16.8193000
## 27   -5.2807438
## 28    8.7445223
## 29   -8.3954585
## 30   -2.8225474
## 31    9.4791879
## 32    4.5814468
## 33   -9.7973708
## 34   18.5934384
## 35  -10.0461072
## 36    6.2278192
## 37   -4.7531100
## 38   -7.3461183
## 39   -4.5959568
## 40   -5.3560046
## 41   -8.3306030
## 42   10.8396654
## 43  -11.7298953
## 44   -3.7688238
## 45    7.3716845
## 46    3.6449228
## 47  -17.9153506
## 48    3.0075419
## 49    6.2862351
## 50  -10.1074075
## 51  -16.8779275
## 52   -5.8213153
## 53    4.8306380
## 54   12.0651376
## 55   -8.7824911
## 56    5.7466443
## 57   14.5180484
## 58   -7.8020244
## 59    9.3230032
## 60   -6.6676340
```

```
## 61   -4.8913799
## 62    0.7261027
## 63    0.5005082
## 64    5.8325614
## 65  -10.6263551
## 66   22.9925335
## 67  -15.4843046
## 68   13.2136467
## 69    3.3372017
## 70   -0.9767342
## 71   11.5633417
## 72   -3.7665942
## 73    2.5616257
## 74   -4.0757831
## 75   -4.3301969
## 76   13.4655995
## 77    0.4880557
## 78   -3.3959112
## 79    1.8890312
## 80   -5.3041218
## 81    7.8550437
## 82   28.2351729
## 83    1.7189847
## 84  -24.3341745
## 85   14.1647848
## 86    4.3493920
## 87  -22.8615727
## 88   27.8948864
## 89  -21.9557298
## 90    3.6872327
## 91    5.1317243
## 92    9.6691232
## 93  -11.7705878
## 94   33.8392833
## 95   -7.1779957
## 96   -1.4645113
## 97    4.9636283
## 98  -16.1860060
## 99  -10.6566106
## 100  27.4178621
## 101 -18.0183898
## 102   9.4935095
## 103 -21.6545087
## 104  12.8907320
## 105 -18.7635154
## 106  10.9199031
## 107  -3.0629120
## 108  10.4653839
## 109   1.4409470
## 110  12.1505452
## 111  29.6819654
## 112 -13.7383209
## 113  -4.8591200
## 114  48.7657434
```

```
## 115 -30.5175384
## 116   9.2224958
## 117  14.6091032
## 118 -10.6571057
## 119  11.5762788
## 120   1.3779654
## 121  -2.5451642
## 122   7.3847343
## 123  -4.9941258
## 124  -2.7004212
## 125  -5.4470931
## 126  17.1943973
## 127  -5.1112005
## 128  18.6072754
## 129  -3.0290268
## 130   1.0222126
## 131   9.8595820
## 132  -1.5185557
## 133  -9.3515276
## 134  -7.2065443
## 135   1.8601473
## 136  -8.2587955
## 137 -14.1375979
## 138  25.2571981
## 139 -13.1284940
## 140  13.9897675
## 141  -8.1040416
## 142   1.6465043
## 143   8.1508941
## 144  -9.9346778
## 145   3.7386399
## 146  -3.5293642
## 147   1.3442374
## 148   5.6344756
## 149 -10.6683073
## 150  13.6886626
```

5)

```
preditores_adicionais <- read_csv2("preditores_adicionais.csv")
```

```
## i Using "','" as decimal and "'.'" as grouping mark. Use `read_delim()` for more control.
```

```
## Rows: 149 Columns: 3
## -- Column specification --------------------------------------------------------
## Delimiter: ";"
## chr (1): date
## dbl (2): expec, ibovespa
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
print(preditores_adicionais)
```

```
## # A tibble: 149 x 3
##    date       expec ibovespa
##    <chr>      <dbl>    <dbl>
##  1 01/01/2012  0.59    11.1
##  2 01/02/2012  0.55     4.34
##  3 01/03/2012  0.45    -1.98
##  4 01/04/2012  0.51    -4.17
##  5 01/05/2012  0.48   -11.9
##  6 01/06/2012  0.23    -0.25
##  7 01/07/2012  0.2      3.21
##  8 01/08/2012  0.33     1.72
##  9 01/09/2012  0.44     3.7
## 10 01/10/2012  0.51    -3.56
## # i 139 more rows
```

```
X = cbind(preditores_adicionais, X)

X = X %>%
  select(-date)
print(X)
```

```
##      expec ibovespa  ipca  igpm ipca15    bm_broad          m1        icbr
## 2    0.590    11.13  0.50 -0.12   0.56  0.19196047 -0.18216761 -1.18281440
## 3    0.550     4.34  0.56  0.25   0.65  0.82774563  9.34721613  0.75690899
## 4    0.450    -1.98  0.45 -0.06   0.53  1.46996853 -3.87886904 -2.42837177
## 5    0.510    -4.17  0.21  0.43   0.25  0.12063843 -2.89641693  2.14861235
## 6    0.480   -11.86  0.64  0.85   0.43  1.19837492 -1.18158140 -0.26292726
## 7    0.230    -0.25  0.36  1.02   0.51  0.85801558  0.31240341  1.58172232
## 8    0.200     3.21  0.08  0.66   0.18  0.37675927  0.27921314 -0.31141869
## 9    0.330     1.72  0.43  1.34   0.33  1.02782992  1.67179007  7.42797640
## 10   0.440     3.70  0.41  1.43   0.39  0.60619146  2.15639408  0.74313409
## 11   0.510    -3.56  0.57  0.97   0.48  0.37923260 -0.91303702  1.77998717
## 12   0.500     0.71  0.59  0.02   0.65  1.28519844  3.28540082 -1.04773909
## 13   0.540     6.05  0.60 -0.03   0.54  1.24713023  0.42944075  1.05883290
## 14   0.780    -1.95  0.79  0.68   0.69  0.54858463  0.83435871  1.42587049
## 15   0.410    -3.91  0.86  0.34   0.88 -0.60340224 12.06026614 -2.05048544
## 16   0.450    -1.87  0.60  0.29   0.68  1.08474727 -3.91509836 -3.25905955
## 17   0.420    -0.78  0.47  0.21   0.49  0.18270082 -3.22903292 -1.54918033
## 18   0.330    -4.30  0.55  0.15   0.51  0.76281025  0.10218389 -1.74839730
## 19   0.320   -11.31  0.37  0.00   0.46  0.71046044  0.06764038  0.15252945
## 20   0.200     1.64  0.26  0.75   0.38  0.23192304  0.13640080  4.94119638
## 21   0.290     3.68  0.03  0.26   0.07  0.71865314  2.09983940  2.08820447
## 22   0.450     4.65  0.24  0.15   0.16  0.72594713  1.53434479  4.01990207
## 23   0.570     3.66  0.35  1.50   0.27  0.50373721 -1.02958943 -2.14106750
## 24   0.670    -3.27  0.57  0.86   0.48  0.63753624  2.05176848 -2.80083792
## 25   0.710    -1.86  0.54  0.29   0.57  0.48239420 -0.28155618  3.15293742
## 26   0.740    -7.51  0.92  0.60   0.75 -0.09243554  1.24005756  2.80120715
## 27   0.650    -1.14  0.55  0.48   0.67  0.07352534 10.14107057  1.89687618
## 28   0.560     7.05  0.69  0.38   0.70  1.97055206 -4.51687630  3.78222649
## 29   0.690     2.40  0.92  1.67   0.73 -0.13819716 -3.40545128  0.12100505
```

```
## 30   0.470    -0.75  0.67  0.78   0.78  0.82795816 -0.16549601 -2.75131523
## 31   0.340     3.76  0.46 -0.13   0.58  0.60673267  0.61274111 -1.83492945
## 32   0.240     5.00  0.40 -0.74   0.47  0.75218729 -1.91133588 -0.54364015
## 33   0.250     9.78  0.01 -0.61   0.17  1.88342320  0.47348563 -1.68476226
## 34   0.400   -11.70  0.25 -0.27   0.14  1.48754566  0.49129666 -1.08910891
## 35   0.500     0.95  0.57  0.20   0.39  0.22339327 -0.75018729  1.94040194
## 36   0.590     0.18  0.42  0.28   0.48  1.96853406  3.14617570  5.20432057
## 37   0.750    -8.62  0.51  0.98   0.38  0.77631142  0.33813638  4.08529581
## 38   1.050    -6.20  0.78  0.62   0.79  1.06696373  0.67605796 -0.29661309
## 39   1.020     9.97  1.24  0.76   0.89  1.02052197  9.32630700 -4.77376505
## 40   1.140    -0.84  1.22  0.27   1.33  1.15943946 -5.06850538  4.59168846
## 41   0.650     9.93  1.32  0.98   1.24  1.47563490 -2.82325969  8.14809669
## 42   0.500    -6.17  0.71  1.17   1.07  2.02809125 -1.58293769 -2.39578650
## 43   0.550     0.61  0.74  0.41   0.60 -0.12196174 -1.48721450  1.14503817
## 44   0.450    -4.17  0.79  0.67   0.99  1.78740323 -1.54297209  0.89134678
## 45   0.300    -8.33  0.62  0.69   0.59  1.11827763 -0.62628881  3.39201651
## 46   0.410    -3.36  0.22  0.28   0.43  2.13109101  0.42629841  4.78388324
## 47   0.650     1.80  0.54  0.95   0.39  1.47729312 -1.84675621  9.29761905
## 48   0.620    -1.63  0.82  1.89   0.66  1.23806234 -0.49742826  0.76789021
## 49   0.900    -3.93  1.01  1.52   0.85  0.90687576  1.46314822 -4.79922175
## 50   0.860    -6.79  0.96  0.49   1.18  0.86847498 -0.08937879  1.13539597
## 51   0.910     5.91  1.27  1.14   0.92  2.18426389  9.53582379  2.94134157
## 52   0.540    16.97  0.90  1.29   1.42  1.39592161 -4.08529364 -1.55406511
## 53   0.600     7.70  0.43  0.51   0.43  0.85337320 -2.40626788 -5.61094494
## 54   0.520   -10.09  0.61  0.33   0.51 -0.17309551 -1.55929699 -3.33900593
## 55   0.330     6.30  0.78  0.82   0.86  0.84141354 -0.11843184  0.92884896
## 56   0.400    11.22  0.35  1.69   0.40  1.56075161 -0.10737951  0.43909774
## 57   0.320     1.03  0.52  0.18   0.54  0.85162277 -1.14788420 -4.91675650
## 58   0.350     0.80  0.44  0.15   0.45  2.27423367  1.47061738 -1.99030043
## 59   0.390    11.23  0.08  0.20   0.23  1.22769960 -0.64539381  1.74795964
## 60   0.390    -4.65  0.26  0.16   0.19  1.54177609  2.19652210 -0.16421398
## 61   0.520    -2.71  0.18 -0.03   0.26  0.07789160  0.84142417  5.49756437
## 62   0.580     7.38  0.30  0.54   0.19  1.53695415 -0.12071934  2.12880787
## 63   0.500     3.08  0.38  0.64   0.31 -0.19782394  9.39723505 -2.98279608
## 64   0.270    -2.52  0.33  0.08   0.54  1.05273965 -4.64658129 -3.40737154
## 65   0.310     0.64  0.25  0.01   0.15  1.20586526 -2.58996052 -2.21177945
## 66   0.500    -4.12  0.14 -1.10   0.21  1.03263251 -0.97611716  0.05125905
## 67   0.000     0.30  0.31 -0.93   0.24  0.84552756  1.02918402  2.49119436
## 68   0.190     4.80 -0.23 -0.67   0.16  1.22319232 -0.38284541 -0.18745314
## 69   0.470     7.46  0.24 -0.72  -0.18  1.31228568  0.81235775 -1.35845749
## 70   0.260     4.88  0.19  0.10   0.35  1.27465143  1.41032653 -2.11969283
## 71   0.380     0.02  0.16  0.47   0.11  1.01432364 -1.41202713  2.14614537
## 72   0.410    -3.15  0.42  0.20   0.34  0.56582783  1.58944154  3.16110194
## 73   0.370     6.16  0.28  0.52   0.32  0.45162549 -0.09141441  5.31011568
## 74   0.370    11.14  0.44  0.89   0.35  0.45772224  0.94023678 -0.87642419
## 75   0.420     0.52  0.29  0.76   0.39  0.37152025 10.79017408  0.91364574
## 76   0.220     0.01  0.32  0.07   0.38  0.68240513 -4.67303828  0.33878505
## 77   0.330     0.88  0.09  0.64   0.10  0.62266938 -1.98677574 -1.56595646
## 78   0.330   -10.87  0.22  0.57   0.21  0.55411112  0.20788541  3.98604294
## 79   0.530    -5.20  0.40  1.38   0.14  0.76113097  0.62671631  9.15088438
## 80   0.350     8.88  1.26  1.87   1.11  0.88951407 -0.05857130  3.13151313
## 81   0.050    -3.21  0.33  0.51   0.64  0.42032018  0.84195186 -0.44965392
## 82   0.240     3.48 -0.09  0.70   0.13  0.96489399  1.53192225  0.83231831
## 83   0.410    10.19  0.48  1.52   0.09 -0.06170365  0.14670141  5.99456412
```

```
## 84   0.150     2.38  0.45  0.89   0.58  0.78859072  2.50604526 -6.10665274
## 85   0.120    -1.81 -0.21 -0.49   0.19  0.31601615 -1.14352408 -2.43261012
## 86   0.370    10.82  0.15 -1.08  -0.16  0.58919697  0.08680447  0.41986316
## 87   0.350    -1.86  0.32  0.01   0.30  0.41659107  9.18591450 -3.52036339
## 88   0.380    -0.18  0.43  0.88   0.34  0.53779762 -4.99752137  0.25145792
## 89   0.450     0.98  0.75  1.26   0.54  0.50195679 -2.45193646  2.56697620
## 90   0.300     0.70  0.57  0.92   0.72  1.31556145  0.39623950  1.52973620
## 91   0.110     4.06  0.13  0.45   0.35  0.71028792  0.56059018 -1.97816840
## 92   0.200     0.84  0.01  0.80   0.06 -0.01218789 -1.56957553 -4.91974695
## 93   0.180    -0.67  0.19  0.40   0.09  0.47985497  0.66959161 -0.75332673
## 94   0.150     3.57  0.11 -0.67   0.08  0.63940824  0.80620751  0.27702366
## 95   0.150     2.36 -0.04 -0.01   0.09  0.86831138 -0.58280691  5.22680811
## 96   0.360     0.95  0.10  0.68   0.09 -0.63456596  2.33050705  2.20530323
## 97   0.700     6.85  0.51  0.30   0.14 -0.22265399  0.66682486  4.94220396
## 98   0.380    -1.63  1.15  2.09   1.05  0.55074309  1.51632722  0.62172615
## 99   0.210    -8.43  0.21  0.48   0.71 -1.07032062 10.63354630  0.98277708
## 100  0.140   -29.90  0.25 -0.04   0.22  0.72895760 -5.75980483 -0.45288109
## 101  0.060    10.25  0.07  1.24   0.02  0.45137694  0.11711548 -4.30742426
## 102 -0.350     8.57 -0.31  0.80  -0.01 -0.24642640  1.82817197  1.56281610
## 103  0.170     8.76 -0.38  0.28  -0.59  1.56539350  7.77970895 12.30516409
## 104  0.390     8.27  0.26  1.56   0.02  2.72275184  7.86898620 -4.85544519
## 105  0.080    -3.44  0.36  2.23   0.30  3.69230419  6.26515134  7.08393531
## 106  0.270    -4.80  0.24  2.74   0.23  1.86086177  3.60838674  9.38764852
## 107  0.450    -0.69  0.64  4.34   0.45  2.04700078  2.44804084  0.53712103
## 108  0.400    15.90  0.86  3.23   0.94  1.93363132  3.60471084  5.54038545
## 109  1.190     9.30  0.89  3.28   0.81  0.75594732  2.42301898  0.11623983
## 110  0.230    -3.32  1.35  0.96   1.06  0.14615341  0.79888939 -1.35580524
## 111  0.560    -4.37  0.25  2.58   0.78  1.01260155  6.11091527 10.55509150
## 112  0.850     6.00  0.86  2.53   0.48  0.78783149 -4.44266853  7.03001580
## 113  0.450     1.94  0.93  2.94   0.93  0.39491893 -1.88702771  5.31686186
## 114  0.455     6.16  0.31  1.51   0.60 -0.54858662 -0.36117133  1.21260130
## 115  0.550     0.46  0.83  4.10   0.44 -0.07124556  0.63188436  1.10475617
## 116  0.580    -3.94  0.53  0.60   0.83  0.42538994 -0.07272637 -3.55196951
## 117  0.450    -2.48  0.96  0.78   0.72  1.03568227  2.17129722  5.17071063
## 118  0.770    -6.57  0.87  0.66   0.89  1.03537163  5.55736831  3.39898441
## 119  0.560    -6.74  1.16 -0.64   1.14  0.44358930 -0.62514374  2.32775996
## 120  0.750    -1.53  1.25  0.64   1.20  0.90287551 -1.57579714 11.28526646
## 121  0.720     2.85  0.95  0.02   1.17  0.65494271 -1.58696176 -0.33403964
## 122  0.450     6.98  0.73  0.87   0.78  0.13906080 -0.78251988 -0.71283860
## 123  0.850     0.89  0.54  1.82   0.58 -0.06858192  3.62262287  2.99274486
## 124  0.900     6.06  1.01  1.83   0.99  0.64037333 -4.00296456 -0.78514822
## 125  0.900   -10.10  1.62  1.74   0.95  0.31019759 -0.94476518  4.37837438
## 126  0.310     3.22  1.06  1.41   1.73  0.37734934  0.34866423 -1.12425896
## 127  0.600   -11.50  0.47  0.52   0.59  1.15026429  1.15879113  3.22002723
## 128 -0.280     4.69  0.67  0.59   0.69  0.66661561 -0.41943515 -0.94651825
## 129 -0.194     0.19 -0.68  0.21   0.13  1.05905870  0.77133802 -2.42979300
## 130  0.170     0.47 -0.36 -0.70  -0.73  0.68123036 -0.58921178 -0.71596188
## 131  0.340     5.45 -0.29 -0.95  -0.37  0.62754522 -0.19777058 -1.37954321
## 132  0.400    -3.06  0.59 -0.97   0.16  0.40374834 -0.60099174 -3.51911178
## 133  0.640    -2.45  0.41 -0.56   0.53  0.51381180 -0.82373659  1.25975869
## 134  0.530     3.37  0.62  0.45   0.52 -0.04354646 -0.02911452 -2.18528624
## 135  0.800    -7.49  0.53  0.21   0.55 -0.55844107  5.62750093 -2.58214761
## 136  0.650    -2.91  0.84 -0.06   0.76  0.83802085 -3.56546502 -1.56303360
## 137  0.590     2.50  0.71  0.05   0.69  0.81508953 -1.19693925 -2.84479078
```

```
## 138  0.440     3.74  0.61 -0.95   0.57  1.11502991 -0.52824210 -0.44498160
## 139  0.300     9.00  0.23 -1.84   0.51  0.86748171  0.04564279 -4.68215429
## 140  0.260     3.26 -0.08 -1.93   0.04  1.32663871 -2.09171932 -0.77286016
## 141  0.300    -5.09  0.12 -0.72  -0.07  1.01154138  0.75492063  1.83780630
## 142  0.410     0.71  0.23 -0.14   0.28  1.32351877  6.18178159  2.85877972
## 143  0.380    -2.94  0.26  0.37   0.35  1.13871710 -0.49983753  3.72897404
## 144  0.300    12.54  0.24  0.50   0.21  0.85287260 -1.05837111  0.98531425
## 145  0.460     5.38  0.28  0.59   0.33  0.88304173 -0.22575951 -5.09118945
## 146  0.400    -4.79  0.56  0.74   0.40  0.65668677  0.39688771 -3.98330485
## 147  0.480     0.99  0.42  0.07   0.31  1.65050400  6.89789159  0.78770021
## 148  0.350    -0.71  0.83 -0.52   0.78  1.32774898 -4.33303935  4.26086201
## 149  0.350    -1.70  0.16 -0.47   0.36  1.01823747 -0.49963319  2.55143119
## 150  0.390    -3.04  0.38  0.31   0.21  0.45239355  1.30755313  5.85846554
##            ibcbr       pimpf   tcu        elec    confidence      brl_usd selic
## 2    -0.19676739  -1.9386107  -1.1 -1.02329632   1.808702369   3.58523920  0.91
## 3    -0.10561893  -8.1548600  -2.4  1.02837659   0.101156983  -7.28494480  0.89
## 4    -1.86085853  -7.2645740   1.3 -1.18937456   7.484368092  -1.71987345  0.75
## 5    -4.23041011   1.2572534  -1.0  1.64164716  -3.384651545   6.60774903  0.82
## 6     1.50742463  10.9837631  -0.1  4.66654020   0.346673154   3.82651661  0.71
## 7     8.12707795  -6.9707401   1.0 -1.62338503  -1.175828838   6.90038071  0.74
## 8    -4.44140758  10.4532840  -0.2 -3.12138120  -0.429316161  -0.04946332  0.64
## 9     3.36789417  -4.1038526   0.2 -0.76609617  -1.102556206   1.42029990  0.68
## 10   -1.57719978   6.3755459   1.2 -1.67268944  -2.653213752  -0.62457305  0.69
## 11    3.64070846   6.7323481   0.0  3.51644068   1.273192578  -0.32406953  0.54
## 12    1.66146752  -7.3076923   1.0  1.29639591   1.952113210   0.03940887  0.61
## 13   -5.54332600   8.1327801   0.0  0.35579629  -1.047217747   3.74236754  0.55
## 14    4.31497175  -6.2164236   0.1  2.24362366   1.327572171  -3.03303588  0.55
## 15   -2.41012795 -12.0294599  -3.6 -2.27460925  -0.778691057  -2.70204122  0.60
## 16   -3.21193202   2.4186047   1.3  1.59406858   3.301152289  -0.64396036  0.49
## 17   -0.14334862  -6.8119891  -0.6 -0.94091276  -3.551401869   1.93933870  0.55
## 18   -2.28251507  11.0136452  -0.2  1.14718729  -2.713178295  -0.60103318  0.61
## 19    8.71896577   4.2142230   0.9  0.55148015  -6.201002442   6.51141872  0.60
## 20    1.20262144   3.0328559   0.4 -0.79939980  -0.637117216   3.92230459  0.61
## 21   -1.84257961  -3.1071137   0.0 -1.86986569  -5.729453944   3.37246050  0.72
## 22   -1.46908794   6.2447257   0.7  0.18603168  -2.698749360   3.58998996  0.71
## 23    5.01138952   3.7331215   0.1  2.42718447   2.781118461  -6.00784181  0.71
## 24   -0.21034641  -4.2879020   1.1 -0.22790252   1.828287260  -1.22903023  0.81
## 25   -2.99058033   4.9600000   0.9  2.24269955  -0.883366849   5.55404178  0.72
## 26    3.14388538  -5.7164634  -1.1  1.34809211  -1.043402652   0.76151960  0.79
## 27   -2.70572745 -15.1172191  -3.0 -0.91182365  -3.536647873   3.57386849  0.85
## 28   -1.36680425   2.7619048   1.0  1.83031651   3.529679672  -3.83394484  0.79
## 29   -2.09233724  -0.3707136  -0.5  3.40863952  -7.779162695  -3.01367514  0.77
## 30    0.56754484   5.4883721  -0.7 -3.32268984  -4.396565432  -1.19342291  0.82
## 31    3.83195151  -1.3227513   0.5 -1.68119397  -8.956340956   0.13420417  0.87
## 32   -0.89914782   5.8981233  -0.2 -1.24267529  -1.927292656  -1.63062902  0.82
## 33   -0.37240165  -6.6666667  -1.0 -3.51406650   2.030362299   2.94745447  0.95
## 34   -4.25445154  10.0361664   0.7  0.37374755   0.903696942  -1.22639845  0.87
## 35    6.36712095   1.8077239   0.6  1.80632213   7.580966166   9.44171505  0.91
## 36   -1.05438772  -0.6456820   0.1  0.89232445  -2.606794484  -0.27750571  0.95
## 37   -0.10116679   3.4118603   1.1  3.09808459   0.146779485   4.74300213  0.84
## 38    1.06670267  -8.6410055  -2.2  2.12219451  -2.620915596   3.75463958  0.96
## 39   -3.19305277 -12.1238177  -2.8 -2.71788235  -0.230190350   0.22970327  0.94
## 40    0.38642009   0.4892368   1.0  2.30935288   0.177478037   8.11511440  0.82
## 41   -4.57107506  -4.9659202  -1.3 -0.09568674  -5.341482859  11.45706641  1.04
```

```
## 42   -1.58467190  12.6024590  -0.9 -2.35762175  -4.959760434  -6.68454200  0.95
## 43    9.47815268  -5.8234759  -0.4 -0.40745492  -9.639621898   6.18443034  0.99
## 44   -4.71988234   4.7342995  -0.7 -3.52299417  -1.296720061  -2.39765898  1.07
## 45   -1.82430536  -0.5535055  -0.8 -2.45536883  -6.657098697   9.39746607  1.18
## 46   -0.92195540   3.1539889   0.8 -1.20223272   0.130100532   7.44680851  1.11
## 47    3.33982543   2.2482014   0.4  2.83300739   1.027639972   8.94380297  1.11
## 48   -1.62641351  -3.3421284   0.8 -0.04490346   3.788144511  -2.86994613  1.11
## 49   -1.96551479   3.0937216   0.3  3.79208287  -3.627351583  -0.21512622  1.06
## 50    1.54892878  -9.9735216  -0.4 -0.13239300   1.893629456   1.41042624  1.16
## 51   -3.03635068 -11.7647059  -4.0 -1.41491396   2.145233452   3.53465499  1.06
## 52    0.21317260  -1.2222222   1.1 -0.69562969   6.951931716  -1.56350502  1.00
## 53   -5.94880070  -0.5624297  -0.9  0.84893623  -6.216528405 -10.57300829  1.16
## 54    1.98876930  10.2941176   0.6  1.85400367  -1.825103572  -3.03796757  1.06
## 55    7.24172211  -0.8205128  -0.1  2.08898466   3.615419708   4.18236624  1.11
## 56   -3.03051911   3.9296794   0.3 -4.02294569   7.925151348 -10.71915426  1.16
## 57   -1.80895654   1.5920398   0.1 -2.84354058  -0.387557369   0.90988408  1.11
## 58    1.28061110   2.2526934   0.4 -0.78561917   2.436776902   0.04014328  1.22
## 59    1.05737947   3.8314176   1.5  1.17836532   6.896551724   0.18211563  1.11
## 60    1.07558352  -2.4907749  -0.2  1.72706532  -0.906965872  -2.00579246  1.05
## 61   -3.10554510  -0.5676443   1.0 -0.38336159   4.076240800   6.77880836  1.04
## 62   -0.85917071  -4.0913416  -2.2  1.45557359   0.389845875  -4.05170637  1.12
## 63   -0.27128862 -10.7142857  -0.8  0.06967023  -7.658267859  -4.05401258  1.09
## 64    0.70273538   0.8888889   0.5  1.51620639  11.295843521  -0.88600307  0.87
## 65   -3.52667517  -2.6431718  -0.4 -1.35385710  -3.884007030   2.22996741  1.05
## 66    0.70000778  12.6696833   0.1  4.40313112  -0.338270251   0.94702948  0.79
## 67    9.66247007  -7.2289157   0.6 -2.75242934  -5.063755619   1.41659891  0.93
## 68   -5.73320186  13.6363636  -0.4 -3.23357849  -3.314329887   1.98883784  0.81
## 69    1.68858338  -1.8095238   0.4 -0.10745643   4.717169698  -5.36642883  0.80
## 70   -0.81557678   4.0737148   0.2 -1.92580154  -3.149456003   0.52394492  0.80
## 71    2.60760056   4.9394222   0.7  1.30016051  -1.783602680   0.66423010  0.64
## 72    1.24178760  -3.8188277   1.1  3.01853906   3.150396308   3.43815116  0.64
## 73   -3.78663624   2.4007387   0.6  0.83826809   1.118568233  -0.46699020  0.57
## 74    0.92647495  -4.7790803  -0.7  1.24822046   5.290496345   1.42287642  0.54
## 75   -0.71968862 -10.6060606  -2.6 -0.55489994   6.851818016  -4.40224950  0.58
## 76    0.51039278   1.5889831   1.9  1.13366662   3.086525308   2.60927320  0.47
## 77   -2.69355314  -6.1522419  -0.1 -2.21195856  -4.088911006   2.43195759  0.53
## 78   -1.64876721  11.6666667   0.4  4.94779034  -4.929090280   4.73338950  0.52
## 79    8.95109197   0.2985075   0.4 -1.00226239   3.238129889   7.35239190  0.52
## 80   -1.75748165  -2.3809524  -0.3 -3.51885981  -8.370044053   3.17953110  0.52
## 81   -4.88540843   7.8252033  -0.5 -2.69974276  -0.500000000  -2.61724424  0.54
## 82    3.53501020   5.1837889   0.9  0.79836662   0.869733282  10.13238154  0.57
## 83    3.00576348   2.5985663   1.7  1.40490288   2.308871431  -3.17798147  0.47
## 84    1.66442383  -7.6855895   0.2 -0.02560885   1.048787340  -7.14910199  0.54
## 85   -5.32255817   5.5818354  -0.6  3.47088809   6.106940969   3.91703209  0.49
## 86    3.00956586  -6.5412186  -1.6  0.03465861  11.615720524   0.29771921  0.49
## 87   -1.56439746 -12.9434324  -3.0 -1.31904573   0.657276995  -5.75344587  0.54
## 88   -0.98693759   3.5242291   1.4  4.44388715   8.356654229   2.37175800  0.49
## 89   -2.04485488  -1.9148936  -0.5 -1.15974740  -9.943324485   4.23232296  0.47
## 90    0.26187804   2.3861171  -0.1 -0.03886891  -3.043097268   1.24740125  0.52
## 91    3.82835821   2.8601695   1.3 -3.46310878  -3.861638321  -0.11661216  0.54
## 92    0.48156400   9.1658084  -0.3  1.90821438  -8.230065806  -2.75373721  0.47
## 93   -0.18597997  -5.6603774   0.4 -5.03940120   3.296703297  -1.75644639  0.57
## 94   -3.08155368   8.9000000   1.0 -0.24713197   3.299675442   9.92482002  0.50
## 95    5.93759243   2.9384757   0.6  0.77191884  -2.085878862   0.62592136  0.46
```

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## 96   -0.84455922  -4.6387154   1.0  1.60447182  -0.329797665  -3.84984870  0.48
## 97   -2.56229762   5.7998129  -0.2  4.59986756   6.099087820   5.49269389  0.38
## 98    3.35211675  -9.3722370  -1.3  1.76292978   2.208361430  -4.57688119  0.37
## 99   -2.83098001 -12.4878049  -2.0 -2.36887443   0.008246743   5.92541128  0.38
## 100  -1.05028415   4.0133779   1.6  1.29160335   8.674857755   5.36906463  0.29
## 101  -2.56633951  -1.5005359  -1.4 -0.88315711  -5.470824797  15.56212623  0.34
## 102   0.33577078  -1.1969532 -17.7  0.42720437 -10.122009953   4.39198938  0.28
## 103   1.22703949 -22.6872247   3.4 -9.41928584 -13.530409931  -0.01289990  0.24
## 104 -12.98853952  18.0911681   6.2 -3.05925290   3.728568478   0.91601084  0.21
## 105   0.95406957  10.1326900   5.7 -0.98272617   2.399681370  -4.98045805  0.19
## 106   5.31905996  16.1007667   3.7  5.87100562  -0.213924543   5.15117151  0.16
## 107   7.95680140   3.2075472   3.8  3.62565687   5.593451569   3.09649588  0.16
## 108  -0.15446855   1.5539305   2.4  2.82860201  -0.692137320   2.32442687  0.16
## 109   1.04611758   2.0702070   0.1  6.37390960   3.754297928  -7.62579706  0.15
## 110   1.96850394  -7.3192240  -1.6 -3.47824061   0.053739364  -2.53231040  0.16
## 111  -1.18690119  -7.6117983  -2.1  1.76196568   3.920866529   5.37326071  0.15
## 112   0.82489146  -1.6477858   0.4  2.21057375   0.120596089   0.99172648  0.13
## 113  -5.84182575  -3.4554974  -1.3 -3.68041213  -2.865009034   3.02191840  0.20
## 114   2.31707317   8.7852495  -1.6  5.18948611  -7.041629761  -5.15561641  0.21
## 115   7.82926103  -5.5832502   1.7 -2.29953505   0.905192949  -3.17231168  0.27
## 116  -3.76511226   8.7645195   1.5 -4.38849427   1.340887630  -4.39636058  0.31
## 117  -1.15577889  -0.5825243   0.7 -0.87286993   3.410361536   2.38723608  0.36
## 118   0.16704191   4.9804687   0.4 -0.58868634   0.910073887   0.42374536  0.43
## 119   3.73404872   1.2093023   1.4  1.78398149   2.384141441   5.75767593  0.44
## 120  -0.78982316  -2.0220588   1.9  2.55451256  -4.613640328   3.74347282  0.49
## 121  -2.26151895  -1.8761726  -0.4  1.53505113  -0.018286550  -0.40940026  0.59
## 122  -0.51899373  -3.8240918  -2.2 -1.70904054   2.423411065  -0.70115495  0.77
## 123   1.21730309  -8.2504970  -1.7  2.50065681  -3.258928571  -3.99827954  0.73
## 124   1.31004367  -2.3835320   0.4 -0.89244105  -3.968620212  -4.06959379  0.76
## 125  -7.05200678  -0.3329634  -0.3 -1.60816307   1.028351754  -7.81505410  0.93
## 126   3.89995439   9.5768374  -0.3  6.75045999  -0.732496195   3.82715528  0.83
## 127   9.46806175  -3.8617886   1.6 -3.27483547   1.456636320  -3.86703263  1.03
## 128  -4.19758038   8.5623679   0.5 -2.68681586  -2.144139038  10.76708331  1.02
## 129  -0.39070676  -0.8763389   0.9 -2.64209275   1.911196911  -0.94703479  1.03
## 130  -0.60236744   5.2062868   0.7  0.71814163   1.117635916  -0.18119434  1.17
## 131   4.84109647   3.3613445  -0.5  2.15361482   4.402397902   4.39517998  1.07
## 132   0.38983734  -4.6070461   0.7  0.44870730   2.485196483  -2.76729560  1.02
## 133  -3.35431173   0.2840909  -0.7  0.49397306   2.241092533   0.70580626  1.02
## 134  -1.14305507  -4.2492918  -1.4  0.55269409   5.180238034  -1.44327949  1.12
## 135  -1.21233357  -9.2702170  -3.5  1.11334612   2.067730381  -2.26946004  1.12
## 136   0.86543236  -1.7391304   1.1 -1.57529493   2.711756261   2.12799341  0.92
## 137  -4.38146142  -3.2079646  -0.2  1.24562269  -1.056064606  -2.44661238  1.17
## 138   3.64077670  13.6000000   1.7  6.11666937  -1.820750275  -1.56895941  0.92
## 139  12.41217799  -7.4446680   0.0 -1.81344883  -2.302158273   1.90396192  1.12
## 140  -6.09217172  13.8043478   0.2 -3.83201515   2.495499918  -5.43049477  1.07
## 141  -1.25042017  -2.5787966   0.6 -1.19309626  -0.646603337  -1.61250156  1.07
## 142  -0.85097692   3.6274510   0.6 -1.51699883   5.270769725   3.80518467  1.14
## 143   3.26146663   5.2980132   1.8  3.37118777   1.236452450   1.74140979  0.97
## 144   0.59179467  -4.4923630  -0.1  2.43672125   0.082931242   0.99660475  1.00
## 145  -4.27022739   0.6585136   0.3  3.53216269  -2.267419962  -2.41254524  0.92
## 146   0.07595636  -3.9252336  -0.9  1.35076442   2.867273008  -1.90885327  0.89
## 147  -0.47609191  -9.7276265  -2.9  1.16563103  -0.157350517   2.31784659  0.97
## 148  -0.06932890   0.9698276   0.8 -0.80272800   3.729831144   0.60166771  0.80
## 149  -2.31719162  -1.4941302   0.1 -1.12309170  -4.123860512   0.25889578  0.83
```

```
## 150   2.96164773   4.6587216   1.0  3.27798052  -2.210987021   3.51509328  0.89
##          saving         cred net_debt_gdp    primary current_account
## 2    0.54900930  1.945753689        -0.89    5731.26         -2486.8
## 3    1.41913825  2.280031359        -0.29    6270.66          1302.2
## 4    0.56767291 -0.037808131         0.53  -24082.32         -5204.4
## 5    0.42343625  0.386339659         0.15   16501.74          7018.3
## 6    1.13086318  1.855524635        -0.89    -927.65         -1481.2
## 7    0.98082740  1.331128975        -0.76   -3797.78            -6.7
## 8    1.94675003  1.684052625        -0.73   11586.72           -15.2
## 9    1.64377332  1.544026991         0.01    -141.24          -857.7
## 10   2.32110474  0.816179226        -0.27   -2775.31          -904.5
## 11   1.23631841  1.230249789         0.09    2572.92          3767.4
## 12   1.74285471  1.108535380         0.02    1406.02          -677.0
## 13   1.14300414  1.417347673        -0.18  -10807.82         -2405.5
## 14   1.30266949  1.518042988        -0.36   17913.77         -1909.1
## 15   2.35161351  2.488141763         0.11  -27767.67           291.7
## 16   0.91137113 -0.091752106        -0.02   -7999.10         -4199.5
## 17   0.94640049  0.736719544         0.42   33282.74          7185.9
## 18   1.62658387  1.823504561        -0.19   -6531.35          -550.1
## 19   0.95091358  0.909947912        -0.26   -6828.32          -352.9
## 20   1.59976551  1.557562694        -0.63    4647.38           440.8
## 21   2.17003961  1.780328341        -0.32     252.40          2801.2
## 22   2.19602806  0.535279209        -0.39    3141.77         -8111.6
## 23   1.32275210  1.286654851        -0.22    2718.66          6404.9
## 24   1.68910972  0.748446200         0.93    8616.00           974.1
## 25   1.31840374  0.272335097         0.11  -15236.28         -2607.3
## 26   1.63583331  1.637022073        -1.04  -23556.95          1491.6
## 27   2.57273947  2.436762172        -0.08   19338.02          1089.4
## 28   0.83334452  0.070075250        -0.49   -9513.96         -9109.3
## 29   0.83542732  0.456312694         0.35   17791.08          5220.4
## 30   0.81951854  0.977270759         0.42   -1449.35           606.3
## 31   0.31797931  0.692441818         0.00  -13316.23          -654.4
## 32   0.89311036  0.962275745         0.32   27942.16          1484.1
## 33   1.05838116  0.951067096         0.38   -8945.88          2047.9
## 34   1.19574466  0.220135338         0.12    2614.66         -5679.0
## 35   0.64691365  0.947773879         0.54    9744.88          4383.2
## 36   0.76652353  1.361106970        -0.07   11030.97         -2029.6
## 37   0.64698211  0.789796207         0.15  -29219.63         -1304.1
## 38   0.94759471  1.272569771        -0.04   11812.86          -475.2
## 39   1.37861509  2.058344740         0.41    4810.02           348.1
## 40  -0.20002398  0.132992826        -0.09  -33957.05         -2619.1
## 41  -0.49843241  0.398283087        -0.20   23362.46          4636.3
## 42  -1.16039881  1.223502993        -0.71   -2539.01          1600.1
## 43  -0.32249768  0.002898439         0.76  -13205.65           194.3
## 44   0.09755894  0.705570411         0.04   20345.42          2146.3
## 45  -0.33790446  0.568948183         0.84    2422.74           303.7
## 46   0.28276708  0.293733020        -0.32     695.50         -2667.3
## 47  -0.48784974  0.797825784        -0.45   -2708.67          3594.2
## 48  -0.17931444  0.957478514        -0.44       8.35           -12.5
## 49   0.12672313 -0.230491259         1.04    4211.86         -2027.0
## 50   0.43251183  0.625778789         0.84    8036.77          1165.1
## 51   1.38596735  1.348933704         1.74   52161.77          3944.7
## 52  -1.21528513 -0.664266764        -0.30  -99641.57         -6124.4
## 53  -0.41581346 -0.493621971         0.94   50952.80          4256.5
```

```
## 54  -0.19847822 -0.671399533        2.05  -12396.43         -207.8
## 55  -0.65378021 -0.631722558        0.54  -20825.24          869.1
## 56  -0.39306297  0.221275521        0.21   28307.04         1965.3
## 57   0.06770079 -0.556210900        2.27   -8063.92        -4020.3
## 58   0.48809996 -0.430828178        0.58    2754.66        -1228.9
## 59  -0.02303935 -0.037323672        0.88    9450.88         2930.9
## 60   0.27568625 -0.114380418        0.82    4375.69         -337.2
## 61   0.21185193 -0.526432113        0.25  -66231.55        -1841.9
## 62   0.90937361  0.291802513        0.11   78729.73         2779.4
## 63   2.54392446  0.103448708        2.15   31596.54        -4117.2
## 64  -1.05856328 -1.016515123        0.32 -107449.40        -1997.8
## 65   0.28758936 -0.099737016        0.80   60179.79         6454.3
## 66  -0.17864681  0.240574394        0.27  -12420.79          414.8
## 67   0.34119241 -0.260188225       -0.05  -23955.15         -931.1
## 68   0.57383045 -0.156565601        0.52   43644.62         2534.6
## 69   1.45681094  0.410223851        0.44  -11184.05        -2038.6
## 70   0.87860042 -0.813827396        1.24   -3414.53        -3843.8
## 71   0.83274759 -0.042348219        0.42   -6608.82         3098.1
## 72   1.01348254 -0.004112586        0.66   11730.42         -367.7
## 73   0.16839968  0.159385567       -0.22  -26017.03         -936.9
## 74   1.00300304  0.385820800        0.32    5666.76        -1331.4
## 75   3.17369683  0.808833507        0.51   31412.28          329.1
## 76  -0.30867618 -0.782635494        0.06  -79261.60        -4275.3
## 77   0.29133846 -0.216230322        0.15   64353.68         1905.5
## 78   0.95853397  0.652959101        0.25    7721.74         2648.1
## 79   0.54024299  0.307427709       -0.61  -28035.19          595.6
## 80   0.70985865  0.441187036       -0.55   11123.96          871.4
## 81   1.14037479  0.681583517        0.04    5267.15         -680.1
## 82   0.87718530 -0.140051650        0.59  -10090.55        -6014.7
## 83   1.16646053  1.016383756       -0.97   13474.90         3644.2
## 84   1.46702139  0.484571286        0.99    7745.63         2456.6
## 85   0.05765773 -0.141467611        1.11  -32419.28         -760.3
## 86   0.47280863  1.113861308       -0.23   23400.03         -941.9
## 87   2.23478931  1.635126154        0.57   25531.04        -2952.2
## 88  -1.03823296 -0.857196061        0.34  -88030.35        -2434.7
## 89  -0.14580916  0.318806231        0.00   61828.17         6591.4
## 90   0.62496389  0.788447113       -0.07    3698.45         -815.7
## 91   0.01730149 -0.013137794        0.01  -25266.32          665.1
## 92   0.29724010  0.569644041        0.19   19645.07         -503.4
## 93   0.67651839  0.315962630        0.58    -301.77          652.5
## 94   0.17960831 -0.164283436        0.44   -9943.24        -8908.4
## 95   0.53944978  1.117048274       -0.94   10684.67         5443.9
## 96   1.42584914  1.073925137        0.32    7093.04         2432.1
## 97   0.31845063  0.341605218        0.47  -29985.04        -5543.1
## 98   0.62061034  1.266511434       -0.33   24756.81         5065.7
## 99   2.39098926  1.541020607        0.92   -1799.81        -1296.9
## 100 -1.15878663 -0.305074525       -1.51  -69788.48        -5348.0
## 101 -0.15668592  0.559956690       -0.64   77176.83         5937.8
## 102  1.74406974  2.838947252       -1.92    2754.32         1551.8
## 103  3.85047331  0.002483536        0.96   70647.23         5762.9
## 104  4.44503188  0.342356717        2.13   37135.51        -1798.5
## 105  2.43836724  0.751065502        2.52   57243.45         2471.4
## 106  3.17594596  1.304373268        1.88 -107610.63        -3582.4
## 107  1.34278223  1.953014844        0.54    6522.77         1646.1
```

```
## 108  1.50130825  2.107537261         0.64  -23035.07         -1268.3
## 109  0.86088004  1.510666058        -0.14  -67511.09         -1079.0
## 110  0.30009189  2.025791521         1.43   21092.32         -1447.2
## 111  2.23608364  1.629495074         0.78   33697.40         -5974.4
## 112 -1.66888879 -0.067611016        -1.66 -110211.83           228.8
## 113 -0.35122181  0.680175624        -0.20   70144.40          4249.8
## 114 -0.17408273  1.521940610        -0.98  -16750.95         -4139.7
## 115  0.56015888  0.497987940        -0.83  -19274.26         11958.1
## 116  0.21874864  1.176327811        -0.17   39796.85         -1406.6
## 117  0.97309831  0.884085150         0.90   49966.67          -326.9
## 118  0.91924399  1.368497271        -0.67  -55224.95         -5345.4
## 119 -0.26060999  1.744020666        -0.58  -27011.74          1457.6
## 120 -0.44257119  2.184369844        -1.01    3795.13         -1411.9
## 121 -0.38466688  1.594749906        -0.97  -22465.89         -2381.6
## 122 -0.82359319  1.886523961        -0.23   20365.28         -2496.4
## 123  1.24231077  1.843565696         0.14   14910.89           767.5
## 124 -1.39755945 -0.004357640        -0.30 -101709.93           380.2
## 125 -0.02239488  0.946119064         0.63   98362.22          5479.2
## 126 -0.95495447  1.410617543         1.22    -841.35          -425.4
## 127 -0.40801654  0.803642936        -0.26  -34564.20          3382.6
## 128  0.45521511  1.136442206         0.51   71869.03         -5344.8
## 129  0.24842027  1.596020786        -0.88  -47387.20          4532.1
## 130 -0.61039193  0.714003227        -0.44   -6045.86         -5928.9
## 131 -1.52863835  1.459571038         0.46   50719.65         -1493.0
## 132  0.04686551  1.793288482        -0.02  -41024.97            41.6
## 133 -0.48814772  0.992364401        -0.05  -16348.82          1909.9
## 134 -0.11581830  1.282623442        -0.16   47183.81          4116.3
## 135  1.28513343  1.518887870         0.31   -8275.80         -6438.1
## 136 -2.64038848  0.166341867        -0.92 -110826.09         -1433.7
## 137 -0.51482396 -0.016591666         0.49  125465.73          4608.6
## 138 -0.01254788  0.959626765         0.27  -12270.55          5052.2
## 139 -0.03864151  0.041082497        -0.03  -34506.97          -944.8
## 140 -0.58877453  0.514048704         0.72   70496.76          1340.4
## 141  0.91812011  0.465243930         1.26   -1273.68         -1935.3
## 142  0.26109246  0.078301557         0.61  -13089.23         -4381.2
## 143 -0.38152084  1.338368836         0.39  -12979.28          3229.0
## 144  0.01622266  1.094113652         0.24   -4759.03          1818.3
## 145 -0.68149699  0.397387700         0.04  -32869.52          -373.0
## 146  0.21931563  1.158208828         0.29   52068.20         -1906.9
## 147  1.98210712  1.610341710         1.42   92303.07         -5357.5
## 148 -1.51965982 -0.195543945        -0.78 -231719.15          2415.2
## 149  0.10113107  0.345319297         0.88  150838.12           808.4
## 150  0.70368184  1.670781682         0.35  -49868.77          -248.1
##     trade_balance     imports
## 2      78.1149398   7.3425958
## 3     -82.8931954 -13.4834566
## 4     974.6429270  -4.7859610
## 5     -67.7014110  -6.4635734
## 6      18.4329200  15.7112372
## 7      45.7639219  -0.9447098
## 8     -47.9379592   8.3049993
## 9     108.4859508  -8.3993692
## 10    -56.4333203  -2.2135250
## 11    -52.8656263   5.5010607
```

```
## 12    151.7579842  -8.8057714
## 13     96.0430608  15.8289858
## 14     25.4645295   2.1720678
## 15    -32.6693321 -15.2500456
## 16    197.1644413  14.0765504
## 17    -38.4697244 -15.8025709
## 18    -16.7166302  13.6496906
## 19     31.1013175  12.9311553
## 20    -23.7530360  -2.6167133
## 21    -59.6902267 -10.5333459
## 22    288.8392602  20.4871461
## 23    -44.2322136 -10.9467702
## 24    -11.5374459  -6.5019225
## 25     77.8172483  21.8487395
## 26    -55.6801585 -16.8193000
## 27    -12.7159091  -5.2807438
## 28    243.3624094   8.7445223
## 29    -17.7424451  -8.3954585
## 30    -30.9758309  -2.8225474
## 31      6.2239833   9.4791879
## 32     -0.6202980   4.5814468
## 33    -53.2927061  -9.7973708
## 34     75.2099323  18.5934384
## 35     -6.9519957 -10.0461072
## 36     79.9036305   6.2278192
## 37     -0.5603017  -4.7531100
## 38      9.8822000  -7.3461183
## 39    -21.0734662  -4.5959568
## 40     29.7040660  -5.3560046
## 41     -8.4163593  -8.3306030
## 42    -33.5091357  10.8396654
## 43    -10.7590789 -11.7298953
## 44    -58.1995442  -3.7688238
## 45   -108.6145272   7.3716845
## 46  -1094.0225035   3.6449228
## 47    -34.1917227 -17.9153506
## 48      7.0629972   3.0075419
## 49     80.6807912   6.2862351
## 50     18.4061354 -10.1074075
## 51   -233.7369755 -16.8779275
## 52   -124.6683512  -5.8213153
## 53   -150.3343292   4.8306380
## 54     95.4776710  12.0651376
## 55    117.6402545  -8.7824911
## 56    108.3244752   5.7466443
## 57   -116.3504162  14.5180484
## 58   -378.6034718  -7.8020244
## 59    -26.2531504   9.3230032
## 60    -61.0499335  -6.6676340
## 61   -406.6780405  -4.8913799
## 62   -224.8430422   0.7261027
## 63    -86.4918200   0.5005082
## 64   -380.3958530   5.8325614
## 65   -324.9579832 -10.6263551
```

```
## 66    140.6425103  22.9925335
## 67     -6.9202111 -15.4843046
## 68     20.2061305  13.2136467
## 69    -32.6562890   3.3372017
## 70    -29.5550062  -0.9767342
## 71    -44.8441247  11.5633417
## 72    -21.5800636  -3.7665942
## 73      2.5963489   2.5616257
## 74   -256.5309081  -4.0757831
## 75    -78.1239475  -4.3301969
## 76    472.7097768  13.4655995
## 77    -36.6624101   0.4880557
## 78   -331.4728353  -3.3959112
## 79    -36.7012011   1.8890312
## 80     30.6199305  -5.3041218
## 81    -32.1412730   7.8550437
## 82   -171.0107035  28.2351729
## 83    153.3195259   1.7189847
## 84   -148.8008721 -24.3341745
## 85    -28.4810127  14.1647848
## 86   -154.7891723   4.3493920
## 87   -464.5130641 -22.8615727
## 88   -302.9453929  27.8948864
## 89    -69.1337015 -21.9557298
## 90   -122.7504421   3.6872327
## 91    118.0612711   5.1317243
## 92    -26.3577270   9.6691232
## 93   -128.6446469 -11.7705878
## 94   3237.8727634  33.8392833
## 95    -62.7743530  -7.1779957
## 96    -56.9120000  -1.4645113
## 97    519.2536205   4.9636283
## 98    -77.4323149 -16.1860060
## 99   -157.1011027 -10.6566106
## 100 -1505.6305258  27.4178621
## 101   -67.3022809 -18.0183898
## 102   -93.0950694   9.4935095
## 103 -2494.2815249 -21.6545087
## 104   -65.2336334  12.8907320
## 105   298.8814515 -18.7635154
## 106    -6.2023891  10.9199031
## 107   -23.1897363  -3.0629120
## 108   -26.9453554  10.4653839
## 109   -29.2234761   1.4409470
## 110  -132.2980262  12.1505452
## 111   652.6885667  29.6819654
## 112     3.9449944 -13.7383209
## 113   -46.1343592  -4.8591200
## 114    -4.7944609  48.7657434
## 115  -416.3746970 -30.5175384
## 116   -26.2675476   9.2224958
## 117     1.0745098  14.6091032
## 118   -21.2403973 -10.6571057
## 119   -20.5078943  11.5762788
```

```
## 120   -93.1087906   1.3779654
## 121  -599.2805755  -2.5451642
## 122   358.7896254   7.3847343
## 123   -93.6381124  -4.9941258
## 124  1118.9447701  -2.7004212
## 125  -116.7392295  -5.4470931
## 126   310.4491154  17.1943973
## 127    31.7061489  -5.1112005
## 128  -103.2868052  18.6072754
## 129 -2755.0638298  -3.0290268
## 130   -70.1958522   1.0222126
## 131  -228.6190579   9.8595820
## 132   -13.9058450  -1.5185557
## 133    51.2043512  -9.3515276
## 134  -230.9031346  -7.2065443
## 135  -131.9937190   1.8601473
## 136   131.8865031  -8.2587955
## 137  -106.5083670 -14.1375979
## 138  6197.0528455  25.2571981
## 139   -31.6688992 -13.1284940
## 140    44.5347189  13.9897675
## 141   -24.4051899  -8.1040416
## 142   -23.6116815   1.6465043
## 143    36.5414002   8.1508941
## 144   -13.1416965  -9.9346778
## 145    -3.3929850   3.7386399
## 146   -22.5622407  -3.5293642
## 147    11.3099225   1.3442374
## 148   -78.1770251   5.6344756
## 149  -158.1932773 -10.6683073
## 150  -352.7527076  13.6886626
```

6) Acrescentando defasagens aos preditores:

```
nomes <- colnames(X)

X <- as.matrix(X)
X <- embed(X, 2)
nomes <- paste0(rep(nomes, 2),"-",rep(1:2, each = ncol(X)/2))
colnames(X) <- nomes

X <- as.data.frame(X)
X <- X %>% select(-`expec-2`)
X <- X %>% rename(expec = `expec-1`)
print(colnames(X))
```

```
##  [1] "expec"             "ibovespa-1"        "ipca-1"
##  [4] "igpm-1"            "ipca15-1"          "bm_broad-1"
##  [7] "m1-1"              "icbr-1"            "ibcbr-1"
## [10] "pimpf-1"           "tcu-1"             "elec-1"
## [13] "confidence-1"      "brl_usd-1"         "selic-1"
## [16] "saving-1"          "cred-1"            "net_debt_gdp-1"
## [19] "primary-1"         "current_account-1" "trade_balance-1"
```

```
## [22] "imports-1"         "ibovespa-2"        "ipca-2"
## [25] "igpm-2"            "ipca15-2"          "bm_broad-2"
## [28] "m1-2"              "icbr-2"            "ibcbr-2"
## [31] "pimpf-2"           "tcu-2"             "elec-2"
## [34] "confidence-2"      "brl_usd-2"         "selic-2"
## [37] "saving-2"          "cred-2"            "net_debt_gdp-2"
## [40] "primary-2"         "current_account-2" "trade_balance-2"
## [43] "imports-2"
```

7)

```
dim(X)
```

```
## [1] 148  43
```

8)

```
y = inf$inf
y_lags = embed(y, 3)[, -1]
colnames(y_lags) = c("y(-1)", "y(-2)")
```

```
X <- X[-1, ]

X <- cbind(y_lags,X)

print(X)
```

```
##     y(-1) y(-2)  expec ibovespa-1 ipca-1 igpm-1 ipca15-1  bm_broad-1
## 2    0.45  0.56  0.450      -1.98   0.45  -0.06     0.53  1.46996853
## 3    0.21  0.45  0.510      -4.17   0.21   0.43     0.25  0.12063843
## 4    0.64  0.21  0.480     -11.86   0.64   0.85     0.43  1.19837492
## 5    0.36  0.64  0.230      -0.25   0.36   1.02     0.51  0.85801558
## 6    0.08  0.36  0.200       3.21   0.08   0.66     0.18  0.37675927
## 7    0.43  0.08  0.330       1.72   0.43   1.34     0.33  1.02782992
## 8    0.41  0.43  0.440       3.70   0.41   1.43     0.39  0.60619146
## 9    0.57  0.41  0.510      -3.56   0.57   0.97     0.48  0.37923260
## 10   0.59  0.57  0.500       0.71   0.59   0.02     0.65  1.28519844
## 11   0.60  0.59  0.540       6.05   0.60  -0.03     0.54  1.24713023
## 12   0.79  0.60  0.780      -1.95   0.79   0.68     0.69  0.54858463
## 13   0.86  0.79  0.410      -3.91   0.86   0.34     0.88 -0.60340224
## 14   0.60  0.86  0.450      -1.87   0.60   0.29     0.68  1.08474727
## 15   0.47  0.60  0.420      -0.78   0.47   0.21     0.49  0.18270082
## 16   0.55  0.47  0.330      -4.30   0.55   0.15     0.51  0.76281025
## 17   0.37  0.55  0.320     -11.31   0.37   0.00     0.46  0.71046044
## 18   0.26  0.37  0.200       1.64   0.26   0.75     0.38  0.23192304
## 19   0.03  0.26  0.290       3.68   0.03   0.26     0.07  0.71865314
## 20   0.24  0.03  0.450       4.65   0.24   0.15     0.16  0.72594713
## 21   0.35  0.24  0.570       3.66   0.35   1.50     0.27  0.50373721
## 22   0.57  0.35  0.670      -3.27   0.57   0.86     0.48  0.63753624
## 23   0.54  0.57  0.710      -1.86   0.54   0.29     0.57  0.48239420
## 24   0.92  0.54  0.740      -7.51   0.92   0.60     0.75 -0.09243554
## 25   0.55  0.92  0.650      -1.14   0.55   0.48     0.67  0.07352534
```

```
## 26   0.69  0.55  0.560       7.05   0.69   0.38     0.70  1.97055206
## 27   0.92  0.69  0.690       2.40   0.92   1.67     0.73 -0.13819716
## 28   0.67  0.92  0.470      -0.75   0.67   0.78     0.78  0.82795816
## 29   0.46  0.67  0.340       3.76   0.46  -0.13     0.58  0.60673267
## 30   0.40  0.46  0.240       5.00   0.40  -0.74     0.47  0.75218729
## 31   0.01  0.40  0.250       9.78   0.01  -0.61     0.17  1.88342320
## 32   0.25  0.01  0.400     -11.70   0.25  -0.27     0.14  1.48754566
## 33   0.57  0.25  0.500       0.95   0.57   0.20     0.39  0.22339327
## 34   0.42  0.57  0.590       0.18   0.42   0.28     0.48  1.96853406
## 35   0.51  0.42  0.750      -8.62   0.51   0.98     0.38  0.77631142
## 36   0.78  0.51  1.050      -6.20   0.78   0.62     0.79  1.06696373
## 37   1.24  0.78  1.020       9.97   1.24   0.76     0.89  1.02052197
## 38   1.22  1.24  1.140      -0.84   1.22   0.27     1.33  1.15943946
## 39   1.32  1.22  0.650       9.93   1.32   0.98     1.24  1.47563490
## 40   0.71  1.32  0.500      -6.17   0.71   1.17     1.07  2.02809125
## 41   0.74  0.71  0.550       0.61   0.74   0.41     0.60 -0.12196174
## 42   0.79  0.74  0.450      -4.17   0.79   0.67     0.99  1.78740323
## 43   0.62  0.79  0.300      -8.33   0.62   0.69     0.59  1.11827763
## 44   0.22  0.62  0.410      -3.36   0.22   0.28     0.43  2.13109101
## 45   0.54  0.22  0.650       1.80   0.54   0.95     0.39  1.47729312
## 46   0.82  0.54  0.620      -1.63   0.82   1.89     0.66  1.23806234
## 47   1.01  0.82  0.900      -3.93   1.01   1.52     0.85  0.90687576
## 48   0.96  1.01  0.860      -6.79   0.96   0.49     1.18  0.86847498
## 49   1.27  0.96  0.910       5.91   1.27   1.14     0.92  2.18426389
## 50   0.90  1.27  0.540      16.97   0.90   1.29     1.42  1.39592161
## 51   0.43  0.90  0.600       7.70   0.43   0.51     0.43  0.85337320
## 52   0.61  0.43  0.520     -10.09   0.61   0.33     0.51 -0.17309551
## 53   0.78  0.61  0.330       6.30   0.78   0.82     0.86  0.84141354
## 54   0.35  0.78  0.400      11.22   0.35   1.69     0.40  1.56075161
## 55   0.52  0.35  0.320       1.03   0.52   0.18     0.54  0.85162277
## 56   0.44  0.52  0.350       0.80   0.44   0.15     0.45  2.27423367
## 57   0.08  0.44  0.390      11.23   0.08   0.20     0.23  1.22769960
## 58   0.26  0.08  0.390      -4.65   0.26   0.16     0.19  1.54177609
## 59   0.18  0.26  0.520      -2.71   0.18  -0.03     0.26  0.07789160
## 60   0.30  0.18  0.580       7.38   0.30   0.54     0.19  1.53695415
## 61   0.38  0.30  0.500       3.08   0.38   0.64     0.31 -0.19782394
## 62   0.33  0.38  0.270      -2.52   0.33   0.08     0.54  1.05273965
## 63   0.25  0.33  0.310       0.64   0.25   0.01     0.15  1.20586526
## 64   0.14  0.25  0.500      -4.12   0.14  -1.10     0.21  1.03263251
## 65   0.31  0.14  0.000       0.30   0.31  -0.93     0.24  0.84552756
## 66  -0.23  0.31  0.190       4.80  -0.23  -0.67     0.16  1.22319232
## 67   0.24 -0.23  0.470       7.46   0.24  -0.72    -0.18  1.31228568
## 68   0.19  0.24  0.260       4.88   0.19   0.10     0.35  1.27465143
## 69   0.16  0.19  0.380       0.02   0.16   0.47     0.11  1.01432364
## 70   0.42  0.16  0.410      -3.15   0.42   0.20     0.34  0.56582783
## 71   0.28  0.42  0.370       6.16   0.28   0.52     0.32  0.45162549
## 72   0.44  0.28  0.370      11.14   0.44   0.89     0.35  0.45772224
## 73   0.29  0.44  0.420       0.52   0.29   0.76     0.39  0.37152025
## 74   0.32  0.29  0.220       0.01   0.32   0.07     0.38  0.68240513
## 75   0.09  0.32  0.330       0.88   0.09   0.64     0.10  0.62266938
## 76   0.22  0.09  0.330     -10.87   0.22   0.57     0.21  0.55411112
## 77   0.40  0.22  0.530      -5.20   0.40   1.38     0.14  0.76113097
## 78   1.26  0.40  0.350       8.88   1.26   1.87     1.11  0.88951407
## 79   0.33  1.26  0.050      -3.21   0.33   0.51     0.64  0.42032018
```

```
## 80  -0.09  0.33  0.240       3.48  -0.09   0.70     0.13  0.96489399
## 81   0.48 -0.09  0.410      10.19   0.48   1.52     0.09 -0.06170365
## 82   0.45  0.48  0.150       2.38   0.45   0.89     0.58  0.78859072
## 83  -0.21  0.45  0.120      -1.81  -0.21  -0.49     0.19  0.31601615
## 84   0.15 -0.21  0.370      10.82   0.15  -1.08    -0.16  0.58919697
## 85   0.32  0.15  0.350      -1.86   0.32   0.01     0.30  0.41659107
## 86   0.43  0.32  0.380      -0.18   0.43   0.88     0.34  0.53779762
## 87   0.75  0.43  0.450       0.98   0.75   1.26     0.54  0.50195679
## 88   0.57  0.75  0.300       0.70   0.57   0.92     0.72  1.31556145
## 89   0.13  0.57  0.110       4.06   0.13   0.45     0.35  0.71028792
## 90   0.01  0.13  0.200       0.84   0.01   0.80     0.06 -0.01218789
## 91   0.19  0.01  0.180      -0.67   0.19   0.40     0.09  0.47985497
## 92   0.11  0.19  0.150       3.57   0.11  -0.67     0.08  0.63940824
## 93  -0.04  0.11  0.150       2.36  -0.04  -0.01     0.09  0.86831138
## 94   0.10 -0.04  0.360       0.95   0.10   0.68     0.09 -0.63456596
## 95   0.51  0.10  0.700       6.85   0.51   0.30     0.14 -0.22265399
## 96   1.15  0.51  0.380      -1.63   1.15   2.09     1.05  0.55074309
## 97   0.21  1.15  0.210      -8.43   0.21   0.48     0.71 -1.07032062
## 98   0.25  0.21  0.140     -29.90   0.25  -0.04     0.22  0.72895760
## 99   0.07  0.25  0.060      10.25   0.07   1.24     0.02  0.45137694
## 100 -0.31  0.07 -0.350       8.57  -0.31   0.80    -0.01 -0.24642640
## 101 -0.38 -0.31  0.170       8.76  -0.38   0.28    -0.59  1.56539350
## 102  0.26 -0.38  0.390       8.27   0.26   1.56     0.02  2.72275184
## 103  0.36  0.26  0.080      -3.44   0.36   2.23     0.30  3.69230419
## 104  0.24  0.36  0.270      -4.80   0.24   2.74     0.23  1.86086177
## 105  0.64  0.24  0.450      -0.69   0.64   4.34     0.45  2.04700078
## 106  0.86  0.64  0.400      15.90   0.86   3.23     0.94  1.93363132
## 107  0.89  0.86  1.190       9.30   0.89   3.28     0.81  0.75594732
## 108  1.35  0.89  0.230      -3.32   1.35   0.96     1.06  0.14615341
## 109  0.25  1.35  0.560      -4.37   0.25   2.58     0.78  1.01260155
## 110  0.86  0.25  0.850       6.00   0.86   2.53     0.48  0.78783149
## 111  0.93  0.86  0.450       1.94   0.93   2.94     0.93  0.39491893
## 112  0.31  0.93  0.455       6.16   0.31   1.51     0.60 -0.54858662
## 113  0.83  0.31  0.550       0.46   0.83   4.10     0.44 -0.07124556
## 114  0.53  0.83  0.580      -3.94   0.53   0.60     0.83  0.42538994
## 115  0.96  0.53  0.450      -2.48   0.96   0.78     0.72  1.03568227
## 116  0.87  0.96  0.770      -6.57   0.87   0.66     0.89  1.03537163
## 117  1.16  0.87  0.560      -6.74   1.16  -0.64     1.14  0.44358930
## 118  1.25  1.16  0.750      -1.53   1.25   0.64     1.20  0.90287551
## 119  0.95  1.25  0.720       2.85   0.95   0.02     1.17  0.65494271
## 120  0.73  0.95  0.450       6.98   0.73   0.87     0.78  0.13906080
## 121  0.54  0.73  0.850       0.89   0.54   1.82     0.58 -0.06858192
## 122  1.01  0.54  0.900       6.06   1.01   1.83     0.99  0.64037333
## 123  1.62  1.01  0.900     -10.10   1.62   1.74     0.95  0.31019759
## 124  1.06  1.62  0.310       3.22   1.06   1.41     1.73  0.37734934
## 125  0.47  1.06  0.600     -11.50   0.47   0.52     0.59  1.15026429
## 126  0.67  0.47 -0.280       4.69   0.67   0.59     0.69  0.66661561
## 127 -0.68  0.67 -0.194       0.19  -0.68   0.21     0.13  1.05905870
## 128 -0.36 -0.68  0.170       0.47  -0.36  -0.70    -0.73  0.68123036
## 129 -0.29 -0.36  0.340       5.45  -0.29  -0.95    -0.37  0.62754522
## 130  0.59 -0.29  0.400      -3.06   0.59  -0.97     0.16  0.40374834
## 131  0.41  0.59  0.640      -2.45   0.41  -0.56     0.53  0.51381180
## 132  0.62  0.41  0.530       3.37   0.62   0.45     0.52 -0.04354646
## 133  0.53  0.62  0.800      -7.49   0.53   0.21     0.55 -0.55844107
```

```
## 134  0.84  0.53  0.650      -2.91   0.84  -0.06     0.76  0.83802085
## 135  0.71  0.84  0.590       2.50   0.71   0.05     0.69  0.81508953
## 136  0.61  0.71  0.440       3.74   0.61  -0.95     0.57  1.11502991
## 137  0.23  0.61  0.300       9.00   0.23  -1.84     0.51  0.86748171
## 138 -0.08  0.23  0.260       3.26  -0.08  -1.93     0.04  1.32663871
## 139  0.12 -0.08  0.300      -5.09   0.12  -0.72    -0.07  1.01154138
## 140  0.23  0.12  0.410       0.71   0.23  -0.14     0.28  1.32351877
## 141  0.26  0.23  0.380      -2.94   0.26   0.37     0.35  1.13871710
## 142  0.24  0.26  0.300      12.54   0.24   0.50     0.21  0.85287260
## 143  0.28  0.24  0.460       5.38   0.28   0.59     0.33  0.88304173
## 144  0.56  0.28  0.400      -4.79   0.56   0.74     0.40  0.65668677
## 145  0.42  0.56  0.480       0.99   0.42   0.07     0.31  1.65050400
## 146  0.83  0.42  0.350      -0.71   0.83  -0.52     0.78  1.32774898
## 147  0.16  0.83  0.350      -1.70   0.16  -0.47     0.36  1.01823747
## 148  0.38  0.16  0.390      -3.04   0.38   0.31     0.21  0.45239355
##            m1-1      icbr-1      ibcbr-1     pimpf-1 tcu-1      elec-1
## 2   -3.87886904 -2.42837177  -1.86085853  -7.2645740   1.3 -1.18937456
## 3   -2.89641693  2.14861235  -4.23041011   1.2572534  -1.0  1.64164716
## 4   -1.18158140 -0.26292726   1.50742463  10.9837631  -0.1  4.66654020
## 5    0.31240341  1.58172232   8.12707795  -6.9707401   1.0 -1.62338503
## 6    0.27921314 -0.31141869  -4.44140758  10.4532840  -0.2 -3.12138120
## 7    1.67179007  7.42797640   3.36789417  -4.1038526   0.2 -0.76609617
## 8    2.15639408  0.74313409  -1.57719978   6.3755459   1.2 -1.67268944
## 9   -0.91303702  1.77998717   3.64070846   6.7323481   0.0  3.51644068
## 10   3.28540082 -1.04773909   1.66146752  -7.3076923   1.0  1.29639591
## 11   0.42944075  1.05883290  -5.54332600   8.1327801   0.0  0.35579629
## 12   0.83435871  1.42587049   4.31497175  -6.2164236   0.1  2.24362366
## 13  12.06026614 -2.05048544  -2.41012795 -12.0294599  -3.6 -2.27460925
## 14  -3.91509836 -3.25905955  -3.21193202   2.4186047   1.3  1.59406858
## 15  -3.22903292 -1.54918033  -0.14334862  -6.8119891  -0.6 -0.94091276
## 16   0.10218389 -1.74839730  -2.28251507  11.0136452  -0.2  1.14718729
## 17   0.06764038  0.15252945   8.71896577   4.2142230   0.9  0.55148015
## 18   0.13640080  4.94119638   1.20262144   3.0328559   0.4 -0.79939980
## 19   2.09983940  2.08820447  -1.84257961  -3.1071137   0.0 -1.86986569
## 20   1.53434479  4.01990207  -1.46908794   6.2447257   0.7  0.18603168
## 21  -1.02958943 -2.14106750   5.01138952   3.7331215   0.1  2.42718447
## 22   2.05176848 -2.80083792  -0.21034641  -4.2879020   1.1 -0.22790252
## 23  -0.28155618  3.15293742  -2.99058033   4.9600000   0.9  2.24269955
## 24   1.24005756  2.80120715   3.14388538  -5.7164634  -1.1  1.34809211
## 25  10.14107057  1.89687618  -2.70572745 -15.1172191  -3.0 -0.91182365
## 26  -4.51687630  3.78222649  -1.36680425   2.7619048   1.0  1.83031651
## 27  -3.40545128  0.12100505  -2.09233724  -0.3707136  -0.5  3.40863952
## 28  -0.16549601 -2.75131523   0.56754484   5.4883721  -0.7 -3.32268984
## 29   0.61274111 -1.83492945   3.83195151  -1.3227513   0.5 -1.68119397
## 30  -1.91133588 -0.54364015  -0.89914782   5.8981233  -0.2 -1.24267529
## 31   0.47348563 -1.68476226  -0.37240165  -6.6666667  -1.0 -3.51406650
## 32   0.49129666 -1.08910891  -4.25445154  10.0361664   0.7  0.37374755
## 33  -0.75018729  1.94040194   6.36712095   1.8077239   0.6  1.80632213
## 34   3.14617570  5.20432057  -1.05438772  -0.6456820   0.1  0.89232445
## 35   0.33813638  4.08529581  -0.10116679   3.4118603   1.1  3.09808459
## 36   0.67605796 -0.29661309   1.06670267  -8.6410055  -2.2  2.12219451
## 37   9.32630700 -4.77376505  -3.19305277 -12.1238177  -2.8 -2.71788235
## 38  -5.06850538  4.59168846   0.38642009   0.4892368   1.0  2.30935288
## 39  -2.82325969  8.14809669  -4.57107506  -4.9659202  -1.3 -0.09568674
```

```
## 40  -1.58293769 -2.39578650  -1.58467190  12.6024590  -0.9 -2.35762175
## 41  -1.48721450  1.14503817   9.47815268  -5.8234759  -0.4 -0.40745492
## 42  -1.54297209  0.89134678  -4.71988234   4.7342995  -0.7 -3.52299417
## 43  -0.62628881  3.39201651  -1.82430536  -0.5535055  -0.8 -2.45536883
## 44   0.42629841  4.78388324  -0.92195540   3.1539889   0.8 -1.20223272
## 45  -1.84675621  9.29761905   3.33982543   2.2482014   0.4  2.83300739
## 46  -0.49742826  0.76789021  -1.62641351  -3.3421284   0.8 -0.04490346
## 47   1.46314822 -4.79922175  -1.96551479   3.0937216   0.3  3.79208287
## 48  -0.08937879  1.13539597   1.54892878  -9.9735216  -0.4 -0.13239300
## 49   9.53582379  2.94134157  -3.03635068 -11.7647059  -4.0 -1.41491396
## 50  -4.08529364 -1.55406511   0.21317260  -1.2222222   1.1 -0.69562969
## 51  -2.40626788 -5.61094494  -5.94880070  -0.5624297  -0.9  0.84893623
## 52  -1.55929699 -3.33900593   1.98876930  10.2941176   0.6  1.85400367
## 53  -0.11843184  0.92884896   7.24172211  -0.8205128  -0.1  2.08898466
## 54  -0.10737951  0.43909774  -3.03051911   3.9296794   0.3 -4.02294569
## 55  -1.14788420 -4.91675650  -1.80895654   1.5920398   0.1 -2.84354058
## 56   1.47061738 -1.99030043   1.28061110   2.2526934   0.4 -0.78561917
## 57  -0.64539381  1.74795964   1.05737947   3.8314176   1.5  1.17836532
## 58   2.19652210 -0.16421398   1.07558352  -2.4907749  -0.2  1.72706532
## 59   0.84142417  5.49756437  -3.10554510  -0.5676443   1.0 -0.38336159
## 60  -0.12071934  2.12880787  -0.85917071  -4.0913416  -2.2  1.45557359
## 61   9.39723505 -2.98279608  -0.27128862 -10.7142857  -0.8  0.06967023
## 62  -4.64658129 -3.40737154   0.70273538   0.8888889   0.5  1.51620639
## 63  -2.58996052 -2.21177945  -3.52667517  -2.6431718  -0.4 -1.35385710
## 64  -0.97611716  0.05125905   0.70000778  12.6696833   0.1  4.40313112
## 65   1.02918402  2.49119436   9.66247007  -7.2289157   0.6 -2.75242934
## 66  -0.38284541 -0.18745314  -5.73320186  13.6363636  -0.4 -3.23357849
## 67   0.81235775 -1.35845749   1.68858338  -1.8095238   0.4 -0.10745643
## 68   1.41032653 -2.11969283  -0.81557678   4.0737148   0.2 -1.92580154
## 69  -1.41202713  2.14614537   2.60760056   4.9394222   0.7  1.30016051
## 70   1.58944154  3.16110194   1.24178760  -3.8188277   1.1  3.01853906
## 71  -0.09141441  5.31011568  -3.78663624   2.4007387   0.6  0.83826809
## 72   0.94023678 -0.87642419   0.92647495  -4.7790803  -0.7  1.24822046
## 73  10.79017408  0.91364574  -0.71968862 -10.6060606  -2.6 -0.55489994
## 74  -4.67303828  0.33878505   0.51039278   1.5889831   1.9  1.13366662
## 75  -1.98677574 -1.56595646  -2.69355314  -6.1522419  -0.1 -2.21195856
## 76   0.20788541  3.98604294  -1.64876721  11.6666667   0.4  4.94779034
## 77   0.62671631  9.15088438   8.95109197   0.2985075   0.4 -1.00226239
## 78  -0.05857130  3.13151313  -1.75748165  -2.3809524  -0.3 -3.51885981
## 79   0.84195186 -0.44965392  -4.88540843   7.8252033  -0.5 -2.69974276
## 80   1.53192225  0.83231831   3.53501020   5.1837889   0.9  0.79836662
## 81   0.14670141  5.99456412   3.00576348   2.5985663   1.7  1.40490288
## 82   2.50604526 -6.10665274   1.66442383  -7.6855895   0.2 -0.02560885
## 83  -1.14352408 -2.43261012  -5.32255817   5.5818354  -0.6  3.47088809
## 84   0.08680447  0.41986316   3.00956586  -6.5412186  -1.6  0.03465861
## 85   9.18591450 -3.52036339  -1.56439746 -12.9434324  -3.0 -1.31904573
## 86  -4.99752137  0.25145792  -0.98693759   3.5242291   1.4  4.44388715
## 87  -2.45193646  2.56697620  -2.04485488  -1.9148936  -0.5 -1.15974740
## 88   0.39623950  1.52973620   0.26187804   2.3861171  -0.1 -0.03886891
## 89   0.56059018 -1.97816840   3.82835821   2.8601695   1.3 -3.46310878
## 90  -1.56957553 -4.91974695   0.48156400   9.1658084  -0.3  1.90821438
## 91   0.66959161 -0.75332673  -0.18597997  -5.6603774   0.4 -5.03940120
## 92   0.80620751  0.27702366  -3.08155368   8.9000000   1.0 -0.24713197
## 93  -0.58280691  5.22680811   5.93759243   2.9384757   0.6  0.77191884
```

```
## 94   2.33050705  2.20530323  -0.84455922  -4.6387154   1.0  1.60447182
## 95   0.66682486  4.94220396  -2.56229762   5.7998129  -0.2  4.59986756
## 96   1.51632722  0.62172615   3.35211675  -9.3722370  -1.3  1.76292978
## 97  10.63354630  0.98277708  -2.83098001 -12.4878049  -2.0 -2.36887443
## 98  -5.75980483 -0.45288109  -1.05028415   4.0133779   1.6  1.29160335
## 99   0.11711548 -4.30742426  -2.56633951  -1.5005359  -1.4 -0.88315711
## 100  1.82817197  1.56281610   0.33577078  -1.1969532 -17.7  0.42720437
## 101  7.77970895 12.30516409   1.22703949 -22.6872247   3.4 -9.41928584
## 102  7.86898620 -4.85544519 -12.98853952  18.0911681   6.2 -3.05925290
## 103  6.26515134  7.08393531   0.95406957  10.1326900   5.7 -0.98272617
## 104  3.60838674  9.38764852   5.31905996  16.1007667   3.7  5.87100562
## 105  2.44804084  0.53712103   7.95680140   3.2075472   3.8  3.62565687
## 106  3.60471084  5.54038545  -0.15446855   1.5539305   2.4  2.82860201
## 107  2.42301898  0.11623983   1.04611758   2.0702070   0.1  6.37390960
## 108  0.79888939 -1.35580524   1.96850394  -7.3192240  -1.6 -3.47824061
## 109  6.11091527 10.55509150  -1.18690119  -7.6117983  -2.1  1.76196568
## 110 -4.44266853  7.03001580   0.82489146  -1.6477858   0.4  2.21057375
## 111 -1.88702771  5.31686186  -5.84182575  -3.4554974  -1.3 -3.68041213
## 112 -0.36117133  1.21260130   2.31707317   8.7852495  -1.6  5.18948611
## 113  0.63188436  1.10475617   7.82926103  -5.5832502   1.7 -2.29953505
## 114 -0.07272637 -3.55196951  -3.76511226   8.7645195   1.5 -4.38849427
## 115  2.17129722  5.17071063  -1.15577889  -0.5825243   0.7 -0.87286993
## 116  5.55736831  3.39898441   0.16704191   4.9804687   0.4 -0.58868634
## 117 -0.62514374  2.32775996   3.73404872   1.2093023   1.4  1.78398149
## 118 -1.57579714 11.28526646  -0.78982316  -2.0220588   1.9  2.55451256
## 119 -1.58696176 -0.33403964  -2.26151895  -1.8761726  -0.4  1.53505113
## 120 -0.78251988 -0.71283860  -0.51899373  -3.8240918  -2.2 -1.70904054
## 121  3.62262287  2.99274486   1.21730309  -8.2504970  -1.7  2.50065681
## 122 -4.00296456 -0.78514822   1.31004367  -2.3835320   0.4 -0.89244105
## 123 -0.94476518  4.37837438  -7.05200678  -0.3329634  -0.3 -1.60816307
## 124  0.34866423 -1.12425896   3.89995439   9.5768374  -0.3  6.75045999
## 125  1.15879113  3.22002723   9.46806175  -3.8617886   1.6 -3.27483547
## 126 -0.41943515 -0.94651825  -4.19758038   8.5623679   0.5 -2.68681586
## 127  0.77133802 -2.42979300  -0.39070676  -0.8763389   0.9 -2.64209275
## 128 -0.58921178 -0.71596188  -0.60236744   5.2062868   0.7  0.71814163
## 129 -0.19777058 -1.37954321   4.84109647   3.3613445  -0.5  2.15361482
## 130 -0.60099174 -3.51911178   0.38983734  -4.6070461   0.7  0.44870730
## 131 -0.82373659  1.25975869  -3.35431173   0.2840909  -0.7  0.49397306
## 132 -0.02911452 -2.18528624  -1.14305507  -4.2492918  -1.4  0.55269409
## 133  5.62750093 -2.58214761  -1.21233357  -9.2702170  -3.5  1.11334612
## 134 -3.56546502 -1.56303360   0.86543236  -1.7391304   1.1 -1.57529493
## 135 -1.19693925 -2.84479078  -4.38146142  -3.2079646  -0.2  1.24562269
## 136 -0.52824210 -0.44498160   3.64077670  13.6000000   1.7  6.11666937
## 137  0.04564279 -4.68215429  12.41217799  -7.4446680   0.0 -1.81344883
## 138 -2.09171932 -0.77286016  -6.09217172  13.8043478   0.2 -3.83201515
## 139  0.75492063  1.83780630  -1.25042017  -2.5787966   0.6 -1.19309626
## 140  6.18178159  2.85877972  -0.85097692   3.6274510   0.6 -1.51699883
## 141 -0.49983753  3.72897404   3.26146663   5.2980132   1.8  3.37118777
## 142 -1.05837111  0.98531425   0.59179467  -4.4923630  -0.1  2.43672125
## 143 -0.22575951 -5.09118945  -4.27022739   0.6585136   0.3  3.53216269
## 144  0.39688771 -3.98330485   0.07595636  -3.9252336  -0.9  1.35076442
## 145  6.89789159  0.78770021  -0.47609191  -9.7276265  -2.9  1.16563103
## 146 -4.33303935  4.26086201  -0.06932890   0.9698276   0.8 -0.80272800
## 147 -0.49963319  2.55143119  -2.31719162  -1.4941302   0.1 -1.12309170
```

```
## 148  1.30755313  5.85846554   2.96164773   4.6587216   1.0  3.27798052
##      confidence-1    brl_usd-1 selic-1    saving-1       cred-1 net_debt_gdp-1
## 2     7.484368092  -1.71987345    0.75  0.56767291 -0.037808131           0.53
## 3    -3.384651545   6.60774903    0.82  0.42343625  0.386339659           0.15
## 4     0.346673154   3.82651661    0.71  1.13086318  1.855524635          -0.89
## 5    -1.175828838   6.90038071    0.74  0.98082740  1.331128975          -0.76
## 6    -0.429316161  -0.04946332    0.64  1.94675003  1.684052625          -0.73
## 7    -1.102556206   1.42029990    0.68  1.64377332  1.544026991           0.01
## 8    -2.653213752  -0.62457305    0.69  2.32110474  0.816179226          -0.27
## 9     1.273192578  -0.32406953    0.54  1.23631841  1.230249789           0.09
## 10    1.952113210   0.03940887    0.61  1.74285471  1.108535380           0.02
## 11   -1.047217747   3.74236754    0.55  1.14300414  1.417347673          -0.18
## 12    1.327572171  -3.03303588    0.55  1.30266949  1.518042988          -0.36
## 13   -0.778691057  -2.70204122    0.60  2.35161351  2.488141763           0.11
## 14    3.301152289  -0.64396036    0.49  0.91137113 -0.091752106          -0.02
## 15   -3.551401869   1.93933870    0.55  0.94640049  0.736719544           0.42
## 16   -2.713178295  -0.60103318    0.61  1.62658387  1.823504561          -0.19
## 17   -6.201002442   6.51141872    0.60  0.95091358  0.909947912          -0.26
## 18   -0.637117216   3.92230459    0.61  1.59976551  1.557562694          -0.63
## 19   -5.729453944   3.37246050    0.72  2.17003961  1.780328341          -0.32
## 20   -2.698749360   3.58998996    0.71  2.19602806  0.535279209          -0.39
## 21    2.781118461  -6.00784181    0.71  1.32275210  1.286654851          -0.22
## 22    1.828287260  -1.22903023    0.81  1.68910972  0.748446200           0.93
## 23   -0.883366849   5.55404178    0.72  1.31840374  0.272335097           0.11
## 24   -1.043402652   0.76151960    0.79  1.63583331  1.637022073          -1.04
## 25   -3.536647873   3.57386849    0.85  2.57273947  2.436762172          -0.08
## 26    3.529679672  -3.83394484    0.79  0.83334452  0.070075250          -0.49
## 27   -7.779162695  -3.01367514    0.77  0.83542732  0.456312694           0.35
## 28   -4.396565432  -1.19342291    0.82  0.81951854  0.977270759           0.42
## 29   -8.956340956   0.13420417    0.87  0.31797931  0.692441818           0.00
## 30   -1.927292656  -1.63062902    0.82  0.89311036  0.962275745           0.32
## 31    2.030362299   2.94745447    0.95  1.05838116  0.951067096           0.38
## 32    0.903696942  -1.22639845    0.87  1.19574466  0.220135338           0.12
## 33    7.580966166   9.44171505    0.91  0.64691365  0.947773879           0.54
## 34   -2.606794484  -0.27750571    0.95  0.76652353  1.361106970          -0.07
## 35    0.146779485   4.74300213    0.84  0.64698211  0.789796207           0.15
## 36   -2.620915596   3.75463958    0.96  0.94759471  1.272569771          -0.04
## 37   -0.230190350   0.22970327    0.94  1.37861509  2.058344740           0.41
## 38    0.177478037   8.11511440    0.82 -0.20002398  0.132992826          -0.09
## 39   -5.341482859  11.45706641    1.04 -0.49843241  0.398283087          -0.20
## 40   -4.959760434  -6.68454200    0.95 -1.16039881  1.223502993          -0.71
## 41   -9.639621898   6.18443034    0.99 -0.32249768  0.002898439           0.76
## 42   -1.296720061  -2.39765898    1.07  0.09755894  0.705570411           0.04
## 43   -6.657098697   9.39746607    1.18 -0.33790446  0.568948183           0.84
## 44    0.130100532   7.44680851    1.11  0.28276708  0.293733020          -0.32
## 45    1.027639972   8.94380297    1.11 -0.48784974  0.797825784          -0.45
## 46    3.788144511  -2.86994613    1.11 -0.17931444  0.957478514          -0.44
## 47   -3.627351583  -0.21512622    1.06  0.12672313 -0.230491259           1.04
## 48    1.893629456   1.41042624    1.16  0.43251183  0.625778789           0.84
## 49    2.145233452   3.53465499    1.06  1.38596735  1.348933704           1.74
## 50    6.951931716  -1.56350502    1.00 -1.21528513 -0.664266764          -0.30
## 51   -6.216528405 -10.57300829    1.16 -0.41581346 -0.493621971           0.94
## 52   -1.825103572  -3.03796757    1.06 -0.19847822 -0.671399533           2.05
## 53    3.615419708   4.18236624    1.11 -0.65378021 -0.631722558           0.54
```

```
## 54    7.925151348 -10.71915426    1.16 -0.39306297  0.221275521          0.21
## 55   -0.387557369   0.90988408    1.11  0.06770079 -0.556210900          2.27
## 56    2.436776902   0.04014328    1.22  0.48809996 -0.430828178          0.58
## 57    6.896551724   0.18211563    1.11 -0.02303935 -0.037323672          0.88
## 58   -0.906965872  -2.00579246    1.05  0.27568625 -0.114380418          0.82
## 59    4.076240800   6.77880836    1.04  0.21185193 -0.526432113          0.25
## 60    0.389845875  -4.05170637    1.12  0.90937361  0.291802513          0.11
## 61   -7.658267859  -4.05401258    1.09  2.54392446  0.103448708          2.15
## 62   11.295843521  -0.88600307    0.87 -1.05856328 -1.016515123          0.32
## 63   -3.884007030   2.22996741    1.05  0.28758936 -0.099737016          0.80
## 64   -0.338270251   0.94702948    0.79 -0.17864681  0.240574394          0.27
## 65   -5.063755619   1.41659891    0.93  0.34119241 -0.260188225         -0.05
## 66   -3.314329887   1.98883784    0.81  0.57383045 -0.156565601          0.52
## 67    4.717169698  -5.36642883    0.80  1.45681094  0.410223851          0.44
## 68   -3.149456003   0.52394492    0.80  0.87860042 -0.813827396          1.24
## 69   -1.783602680   0.66423010    0.64  0.83274759 -0.042348219          0.42
## 70    3.150396308   3.43815116    0.64  1.01348254 -0.004112586          0.66
## 71    1.118568233  -0.46699020    0.57  0.16839968  0.159385567         -0.22
## 72    5.290496345   1.42287642    0.54  1.00300304  0.385820800          0.32
## 73    6.851818016  -4.40224950    0.58  3.17369683  0.808833507          0.51
## 74    3.086525308   2.60927320    0.47 -0.30867618 -0.782635494          0.06
## 75   -4.088911006   2.43195759    0.53  0.29133846 -0.216230322          0.15
## 76   -4.929090280   4.73338950    0.52  0.95853397  0.652959101          0.25
## 77    3.238129889   7.35239190    0.52  0.54024299  0.307427709         -0.61
## 78   -8.370044053   3.17953110    0.52  0.70985865  0.441187036         -0.55
## 79   -0.500000000  -2.61724424    0.54  1.14037479  0.681583517          0.04
## 80    0.869733282  10.13238154    0.57  0.87718530 -0.140051650          0.59
## 81    2.308871431  -3.17798147    0.47  1.16646053  1.016383756         -0.97
## 82    1.048787340  -7.14910199    0.54  1.46702139  0.484571286          0.99
## 83    6.106940969   3.91703209    0.49  0.05765773 -0.141467611          1.11
## 84   11.615720524   0.29771921    0.49  0.47280863  1.113861308         -0.23
## 85    0.657276995  -5.75344587    0.54  2.23478931  1.635126154          0.57
## 86    8.356654229   2.37175800    0.49 -1.03823296 -0.857196061          0.34
## 87   -9.943324485   4.23232296    0.47 -0.14580916  0.318806231          0.00
## 88   -3.043097268   1.24740125    0.52  0.62496389  0.788447113         -0.07
## 89   -3.861638321  -0.11661216    0.54  0.01730149 -0.013137794          0.01
## 90   -8.230065806  -2.75373721    0.47  0.29724010  0.569644041          0.19
## 91    3.296703297  -1.75644639    0.57  0.67651839  0.315962630          0.58
## 92    3.299675442   9.92482002    0.50  0.17960831 -0.164283436          0.44
## 93   -2.085878862   0.62592136    0.46  0.53944978  1.117048274         -0.94
## 94   -0.329797665  -3.84984870    0.48  1.42584914  1.073925137          0.32
## 95    6.099087820   5.49269389    0.38  0.31845063  0.341605218          0.47
## 96    2.208361430  -4.57688119    0.37  0.62061034  1.266511434         -0.33
## 97    0.008246743   5.92541128    0.38  2.39098926  1.541020607          0.92
## 98    8.674857755   5.36906463    0.29 -1.15878663 -0.305074525         -1.51
## 99   -5.470824797  15.56212623    0.34 -0.15668592  0.559956690         -0.64
## 100 -10.122009953   4.39198938    0.28  1.74406974  2.838947252         -1.92
## 101 -13.530409931  -0.01289990    0.24  3.85047331  0.002483536          0.96
## 102   3.728568478   0.91601084    0.21  4.44503188  0.342356717          2.13
## 103   2.399681370  -4.98045805    0.19  2.43836724  0.751065502          2.52
## 104  -0.213924543   5.15117151    0.16  3.17594596  1.304373268          1.88
## 105   5.593451569   3.09649588    0.16  1.34278223  1.953014844          0.54
## 106  -0.692137320   2.32442687    0.16  1.50130825  2.107537261          0.64
## 107   3.754297928  -7.62579706    0.15  0.86088004  1.510666058         -0.14
```

```
## 108   0.053739364  -2.53231040    0.16  0.30009189  2.025791521           1.43
## 109   3.920866529   5.37326071    0.15  2.23608364  1.629495074           0.78
## 110   0.120596089   0.99172648    0.13 -1.66888879 -0.067611016          -1.66
## 111  -2.865009034   3.02191840    0.20 -0.35122181  0.680175624          -0.20
## 112  -7.041629761  -5.15561641    0.21 -0.17408273  1.521940610          -0.98
## 113   0.905192949  -3.17231168    0.27  0.56015888  0.497987940          -0.83
## 114   1.340887630  -4.39636058    0.31  0.21874864  1.176327811          -0.17
## 115   3.410361536   2.38723608    0.36  0.97309831  0.884085150           0.90
## 116   0.910073887   0.42374536    0.43  0.91924399  1.368497271          -0.67
## 117   2.384141441   5.75767593    0.44 -0.26060999  1.744020666          -0.58
## 118  -4.613640328   3.74347282    0.49 -0.44257119  2.184369844          -1.01
## 119  -0.018286550  -0.40940026    0.59 -0.38466688  1.594749906          -0.97
## 120   2.423411065  -0.70115495    0.77 -0.82359319  1.886523961          -0.23
## 121  -3.258928571  -3.99827954    0.73  1.24231077  1.843565696           0.14
## 122  -3.968620212  -4.06959379    0.76 -1.39755945 -0.004357640          -0.30
## 123   1.028351754  -7.81505410    0.93 -0.02239488  0.946119064           0.63
## 124  -0.732496195   3.82715528    0.83 -0.95495447  1.410617543           1.22
## 125   1.456636320  -3.86703263    1.03 -0.40801654  0.803642936          -0.26
## 126  -2.144139038  10.76708331    1.02  0.45521511  1.136442206           0.51
## 127   1.911196911  -0.94703479    1.03  0.24842027  1.596020786          -0.88
## 128   1.117635916  -0.18119434    1.17 -0.61039193  0.714003227          -0.44
## 129   4.402397902   4.39517998    1.07 -1.52863835  1.459571038           0.46
## 130   2.485196483  -2.76729560    1.02  0.04686551  1.793288482          -0.02
## 131   2.241092533   0.70580626    1.02 -0.48814772  0.992364401          -0.05
## 132   5.180238034  -1.44327949    1.12 -0.11581830  1.282623442          -0.16
## 133   2.067730381  -2.26946004    1.12  1.28513343  1.518887870           0.31
## 134   2.711756261   2.12799341    0.92 -2.64038848  0.166341867          -0.92
## 135  -1.056064606  -2.44661238    1.17 -0.51482396 -0.016591666           0.49
## 136  -1.820750275  -1.56895941    0.92 -0.01254788  0.959626765           0.27
## 137  -2.302158273   1.90396192    1.12 -0.03864151  0.041082497          -0.03
## 138   2.495499918  -5.43049477    1.07 -0.58877453  0.514048704           0.72
## 139  -0.646603337  -1.61250156    1.07  0.91812011  0.465243930           1.26
## 140   5.270769725   3.80518467    1.14  0.26109246  0.078301557           0.61
## 141   1.236452450   1.74140979    0.97 -0.38152084  1.338368836           0.39
## 142   0.082931242   0.99660475    1.00  0.01622266  1.094113652           0.24
## 143  -2.267419962  -2.41254524    0.92 -0.68149699  0.397387700           0.04
## 144   2.867273008  -1.90885327    0.89  0.21931563  1.158208828           0.29
## 145  -0.157350517   2.31784659    0.97  1.98210712  1.610341710           1.42
## 146   3.729831144   0.60166771    0.80 -1.51965982 -0.195543945          -0.78
## 147  -4.123860512   0.25889578    0.83  0.10113107  0.345319297           0.88
## 148  -2.210987021   3.51509328    0.89  0.70368184  1.670781682           0.35
##      primary-1 current_account-1 trade_balance-1   imports-1 ibovespa-2 ipca-2
## 2    -24082.32           -5204.4     974.6429270  -4.7859610       4.34   0.56
## 3     16501.74            7018.3     -67.7014110  -6.4635734      -1.98   0.45
## 4      -927.65           -1481.2      18.4329200  15.7112372      -4.17   0.21
## 5     -3797.78              -6.7      45.7639219  -0.9447098     -11.86   0.64
## 6     11586.72             -15.2     -47.9379592   8.3049993      -0.25   0.36
## 7      -141.24            -857.7     108.4859508  -8.3993692       3.21   0.08
## 8     -2775.31            -904.5     -56.4333203  -2.2135250       1.72   0.43
## 9      2572.92            3767.4     -52.8656263   5.5010607       3.70   0.41
## 10     1406.02            -677.0     151.7579842  -8.8057714      -3.56   0.57
## 11   -10807.82           -2405.5      96.0430608  15.8289858       0.71   0.59
## 12    17913.77           -1909.1      25.4645295   2.1720678       6.05   0.60
## 13   -27767.67             291.7     -32.6693321 -15.2500456      -1.95   0.79
```

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## 14    -7999.10          -4199.5     197.1644413  14.0765504      -3.91   0.86
## 15    33282.74           7185.9     -38.4697244 -15.8025709      -1.87   0.60
## 16    -6531.35           -550.1     -16.7166302  13.6496906      -0.78   0.47
## 17    -6828.32           -352.9      31.1013175  12.9311553      -4.30   0.55
## 18     4647.38            440.8     -23.7530360  -2.6167133     -11.31   0.37
## 19      252.40           2801.2     -59.6902267 -10.5333459       1.64   0.26
## 20     3141.77          -8111.6     288.8392602  20.4871461       3.68   0.03
## 21     2718.66           6404.9     -44.2322136 -10.9467702       4.65   0.24
## 22     8616.00            974.1     -11.5374459  -6.5019225       3.66   0.35
## 23   -15236.28          -2607.3      77.8172483  21.8487395      -3.27   0.57
## 24   -23556.95           1491.6     -55.6801585 -16.8193000      -1.86   0.54
## 25    19338.02           1089.4     -12.7159091  -5.2807438      -7.51   0.92
## 26    -9513.96          -9109.3     243.3624094   8.7445223      -1.14   0.55
## 27    17791.08           5220.4     -17.7424451  -8.3954585       7.05   0.69
## 28    -1449.35            606.3     -30.9758309  -2.8225474       2.40   0.92
## 29   -13316.23           -654.4       6.2239833   9.4791879      -0.75   0.67
## 30    27942.16           1484.1      -0.6202980   4.5814468       3.76   0.46
## 31    -8945.88           2047.9     -53.2927061  -9.7973708       5.00   0.40
## 32     2614.66          -5679.0      75.2099323  18.5934384       9.78   0.01
## 33     9744.88           4383.2      -6.9519957 -10.0461072     -11.70   0.25
## 34    11030.97          -2029.6      79.9036305   6.2278192       0.95   0.57
## 35   -29219.63          -1304.1      -0.5603017  -4.7531100       0.18   0.42
## 36    11812.86           -475.2       9.8822000  -7.3461183      -8.62   0.51
## 37     4810.02            348.1     -21.0734662  -4.5959568      -6.20   0.78
## 38   -33957.05          -2619.1      29.7040660  -5.3560046       9.97   1.24
## 39    23362.46           4636.3      -8.4163593  -8.3306030      -0.84   1.22
## 40    -2539.01           1600.1     -33.5091357  10.8396654       9.93   1.32
## 41   -13205.65            194.3     -10.7590789 -11.7298953      -6.17   0.71
## 42    20345.42           2146.3     -58.1995442  -3.7688238       0.61   0.74
## 43     2422.74            303.7    -108.6145272   7.3716845      -4.17   0.79
## 44      695.50          -2667.3   -1094.0225035   3.6449228      -8.33   0.62
## 45    -2708.67           3594.2     -34.1917227 -17.9153506      -3.36   0.22
## 46        8.35            -12.5       7.0629972   3.0075419       1.80   0.54
## 47     4211.86          -2027.0      80.6807912   6.2862351      -1.63   0.82
## 48     8036.77           1165.1      18.4061354 -10.1074075      -3.93   1.01
## 49    52161.77           3944.7    -233.7369755 -16.8779275      -6.79   0.96
## 50   -99641.57          -6124.4    -124.6683512  -5.8213153       5.91   1.27
## 51    50952.80           4256.5    -150.3343292   4.8306380      16.97   0.90
## 52   -12396.43           -207.8      95.4776710  12.0651376       7.70   0.43
## 53   -20825.24            869.1     117.6402545  -8.7824911     -10.09   0.61
## 54    28307.04           1965.3     108.3244752   5.7466443       6.30   0.78
## 55    -8063.92          -4020.3    -116.3504162  14.5180484      11.22   0.35
## 56     2754.66          -1228.9    -378.6034718  -7.8020244       1.03   0.52
## 57     9450.88           2930.9     -26.2531504   9.3230032       0.80   0.44
## 58     4375.69           -337.2     -61.0499335  -6.6676340      11.23   0.08
## 59   -66231.55          -1841.9    -406.6780405  -4.8913799      -4.65   0.26
## 60    78729.73           2779.4    -224.8430422   0.7261027      -2.71   0.18
## 61    31596.54          -4117.2     -86.4918200   0.5005082       7.38   0.30
## 62  -107449.40          -1997.8    -380.3958530   5.8325614       3.08   0.38
## 63    60179.79           6454.3    -324.9579832 -10.6263551      -2.52   0.33
## 64   -12420.79            414.8     140.6425103  22.9925335       0.64   0.25
## 65   -23955.15           -931.1      -6.9202111 -15.4843046      -4.12   0.14
## 66    43644.62           2534.6      20.2061305  13.2136467       0.30   0.31
## 67   -11184.05          -2038.6     -32.6562890   3.3372017       4.80  -0.23
```

```
## 68    -3414.53          -3843.8     -29.5550062  -0.9767342       7.46   0.24
## 69    -6608.82           3098.1     -44.8441247  11.5633417       4.88   0.19
## 70    11730.42           -367.7     -21.5800636  -3.7665942       0.02   0.16
## 71   -26017.03           -936.9       2.5963489   2.5616257      -3.15   0.42
## 72     5666.76          -1331.4    -256.5309081  -4.0757831       6.16   0.28
## 73    31412.28            329.1     -78.1239475  -4.3301969      11.14   0.44
## 74   -79261.60          -4275.3     472.7097768  13.4655995       0.52   0.29
## 75    64353.68           1905.5     -36.6624101   0.4880557       0.01   0.32
## 76     7721.74           2648.1    -331.4728353  -3.3959112       0.88   0.09
## 77   -28035.19            595.6     -36.7012011   1.8890312     -10.87   0.22
## 78    11123.96            871.4      30.6199305  -5.3041218      -5.20   0.40
## 79     5267.15           -680.1     -32.1412730   7.8550437       8.88   1.26
## 80   -10090.55          -6014.7    -171.0107035  28.2351729      -3.21   0.33
## 81    13474.90           3644.2     153.3195259   1.7189847       3.48  -0.09
## 82     7745.63           2456.6    -148.8008721 -24.3341745      10.19   0.48
## 83   -32419.28           -760.3     -28.4810127  14.1647848       2.38   0.45
## 84    23400.03           -941.9    -154.7891723   4.3493920      -1.81  -0.21
## 85    25531.04          -2952.2    -464.5130641 -22.8615727      10.82   0.15
## 86   -88030.35          -2434.7    -302.9453929  27.8948864      -1.86   0.32
## 87    61828.17           6591.4     -69.1337015 -21.9557298      -0.18   0.43
## 88     3698.45           -815.7    -122.7504421   3.6872327       0.98   0.75
## 89   -25266.32            665.1     118.0612711   5.1317243       0.70   0.57
## 90    19645.07           -503.4     -26.3577270   9.6691232       4.06   0.13
## 91     -301.77            652.5    -128.6446469 -11.7705878       0.84   0.01
## 92    -9943.24          -8908.4    3237.8727634  33.8392833      -0.67   0.19
## 93    10684.67           5443.9     -62.7743530  -7.1779957       3.57   0.11
## 94     7093.04           2432.1     -56.9120000  -1.4645113       2.36  -0.04
## 95   -29985.04          -5543.1     519.2536205   4.9636283       0.95   0.10
## 96    24756.81           5065.7     -77.4323149 -16.1860060       6.85   0.51
## 97    -1799.81          -1296.9    -157.1011027 -10.6566106      -1.63   1.15
## 98   -69788.48          -5348.0   -1505.6305258  27.4178621      -8.43   0.21
## 99    77176.83           5937.8     -67.3022809 -18.0183898     -29.90   0.25
## 100    2754.32           1551.8     -93.0950694   9.4935095      10.25   0.07
## 101   70647.23           5762.9   -2494.2815249 -21.6545087       8.57  -0.31
## 102   37135.51          -1798.5     -65.2336334  12.8907320       8.76  -0.38
## 103   57243.45           2471.4     298.8814515 -18.7635154       8.27   0.26
## 104 -107610.63          -3582.4      -6.2023891  10.9199031      -3.44   0.36
## 105    6522.77           1646.1     -23.1897363  -3.0629120      -4.80   0.24
## 106  -23035.07          -1268.3     -26.9453554  10.4653839      -0.69   0.64
## 107  -67511.09          -1079.0     -29.2234761   1.4409470      15.90   0.86
## 108   21092.32          -1447.2    -132.2980262  12.1505452       9.30   0.89
## 109   33697.40          -5974.4     652.6885667  29.6819654      -3.32   1.35
## 110 -110211.83            228.8       3.9449944 -13.7383209      -4.37   0.25
## 111   70144.40           4249.8     -46.1343592  -4.8591200       6.00   0.86
## 112  -16750.95          -4139.7      -4.7944609  48.7657434       1.94   0.93
## 113  -19274.26          11958.1    -416.3746970 -30.5175384       6.16   0.31
## 114   39796.85          -1406.6     -26.2675476   9.2224958       0.46   0.83
## 115   49966.67           -326.9       1.0745098  14.6091032      -3.94   0.53
## 116  -55224.95          -5345.4     -21.2403973 -10.6571057      -2.48   0.96
## 117  -27011.74           1457.6     -20.5078943  11.5762788      -6.57   0.87
## 118    3795.13          -1411.9     -93.1087906   1.3779654      -6.74   1.16
## 119  -22465.89          -2381.6    -599.2805755  -2.5451642      -1.53   1.25
## 120   20365.28          -2496.4     358.7896254   7.3847343       2.85   0.95
## 121   14910.89            767.5     -93.6381124  -4.9941258       6.98   0.73
```

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## 122 -101709.93            380.2    1118.9447701  -2.7004212       0.89   0.54
## 123   98362.22           5479.2    -116.7392295  -5.4470931       6.06   1.01
## 124    -841.35           -425.4     310.4491154  17.1943973     -10.10   1.62
## 125  -34564.20           3382.6      31.7061489  -5.1112005       3.22   1.06
## 126   71869.03          -5344.8    -103.2868052  18.6072754     -11.50   0.47
## 127  -47387.20           4532.1   -2755.0638298  -3.0290268       4.69   0.67
## 128   -6045.86          -5928.9     -70.1958522   1.0222126       0.19  -0.68
## 129   50719.65          -1493.0    -228.6190579   9.8595820       0.47  -0.36
## 130  -41024.97             41.6     -13.9058450  -1.5185557       5.45  -0.29
## 131  -16348.82           1909.9      51.2043512  -9.3515276      -3.06   0.59
## 132   47183.81           4116.3    -230.9031346  -7.2065443      -2.45   0.41
## 133   -8275.80          -6438.1    -131.9937190   1.8601473       3.37   0.62
## 134 -110826.09          -1433.7     131.8865031  -8.2587955      -7.49   0.53
## 135  125465.73           4608.6    -106.5083670 -14.1375979      -2.91   0.84
## 136  -12270.55           5052.2    6197.0528455  25.2571981       2.50   0.71
## 137  -34506.97           -944.8     -31.6688992 -13.1284940       3.74   0.61
## 138   70496.76           1340.4      44.5347189  13.9897675       9.00   0.23
## 139   -1273.68          -1935.3     -24.4051899  -8.1040416       3.26  -0.08
## 140  -13089.23          -4381.2     -23.6116815   1.6465043      -5.09   0.12
## 141  -12979.28           3229.0      36.5414002   8.1508941       0.71   0.23
## 142   -4759.03           1818.3     -13.1416965  -9.9346778      -2.94   0.26
## 143  -32869.52           -373.0      -3.3929850   3.7386399      12.54   0.24
## 144   52068.20          -1906.9     -22.5622407  -3.5293642       5.38   0.28
## 145   92303.07          -5357.5      11.3099225   1.3442374      -4.79   0.56
## 146 -231719.15           2415.2     -78.1770251   5.6344756       0.99   0.42
## 147  150838.12            808.4    -158.1932773 -10.6683073      -0.71   0.83
## 148  -49868.77           -248.1    -352.7527076  13.6886626      -1.70   0.16
##     igpm-2 ipca15-2  bm_broad-2        m1-2      icbr-2      ibcbr-2
## 2     0.25     0.65  0.82774563  9.34721613  0.75690899  -0.10561893
## 3    -0.06     0.53  1.46996853 -3.87886904 -2.42837177  -1.86085853
## 4     0.43     0.25  0.12063843 -2.89641693  2.14861235  -4.23041011
## 5     0.85     0.43  1.19837492 -1.18158140 -0.26292726   1.50742463
## 6     1.02     0.51  0.85801558  0.31240341  1.58172232   8.12707795
## 7     0.66     0.18  0.37675927  0.27921314 -0.31141869  -4.44140758
## 8     1.34     0.33  1.02782992  1.67179007  7.42797640   3.36789417
## 9     1.43     0.39  0.60619146  2.15639408  0.74313409  -1.57719978
## 10    0.97     0.48  0.37923260 -0.91303702  1.77998717   3.64070846
## 11    0.02     0.65  1.28519844  3.28540082 -1.04773909   1.66146752
## 12   -0.03     0.54  1.24713023  0.42944075  1.05883290  -5.54332600
## 13    0.68     0.69  0.54858463  0.83435871  1.42587049   4.31497175
## 14    0.34     0.88 -0.60340224 12.06026614 -2.05048544  -2.41012795
## 15    0.29     0.68  1.08474727 -3.91509836 -3.25905955  -3.21193202
## 16    0.21     0.49  0.18270082 -3.22903292 -1.54918033  -0.14334862
## 17    0.15     0.51  0.76281025  0.10218389 -1.74839730  -2.28251507
## 18    0.00     0.46  0.71046044  0.06764038  0.15252945   8.71896577
## 19    0.75     0.38  0.23192304  0.13640080  4.94119638   1.20262144
## 20    0.26     0.07  0.71865314  2.09983940  2.08820447  -1.84257961
## 21    0.15     0.16  0.72594713  1.53434479  4.01990207  -1.46908794
## 22    1.50     0.27  0.50373721 -1.02958943 -2.14106750   5.01138952
## 23    0.86     0.48  0.63753624  2.05176848 -2.80083792  -0.21034641
## 24    0.29     0.57  0.48239420 -0.28155618  3.15293742  -2.99058033
## 25    0.60     0.75 -0.09243554  1.24005756  2.80120715   3.14388538
## 26    0.48     0.67  0.07352534 10.14107057  1.89687618  -2.70572745
## 27    0.38     0.70  1.97055206 -4.51687630  3.78222649  -1.36680425
```

```
## 28    1.67     0.73 -0.13819716 -3.40545128  0.12100505  -2.09233724
## 29    0.78     0.78  0.82795816 -0.16549601 -2.75131523   0.56754484
## 30   -0.13     0.58  0.60673267  0.61274111 -1.83492945   3.83195151
## 31   -0.74     0.47  0.75218729 -1.91133588 -0.54364015  -0.89914782
## 32   -0.61     0.17  1.88342320  0.47348563 -1.68476226  -0.37240165
## 33   -0.27     0.14  1.48754566  0.49129666 -1.08910891  -4.25445154
## 34    0.20     0.39  0.22339327 -0.75018729  1.94040194   6.36712095
## 35    0.28     0.48  1.96853406  3.14617570  5.20432057  -1.05438772
## 36    0.98     0.38  0.77631142  0.33813638  4.08529581  -0.10116679
## 37    0.62     0.79  1.06696373  0.67605796 -0.29661309   1.06670267
## 38    0.76     0.89  1.02052197  9.32630700 -4.77376505  -3.19305277
## 39    0.27     1.33  1.15943946 -5.06850538  4.59168846   0.38642009
## 40    0.98     1.24  1.47563490 -2.82325969  8.14809669  -4.57107506
## 41    1.17     1.07  2.02809125 -1.58293769 -2.39578650  -1.58467190
## 42    0.41     0.60 -0.12196174 -1.48721450  1.14503817   9.47815268
## 43    0.67     0.99  1.78740323 -1.54297209  0.89134678  -4.71988234
## 44    0.69     0.59  1.11827763 -0.62628881  3.39201651  -1.82430536
## 45    0.28     0.43  2.13109101  0.42629841  4.78388324  -0.92195540
## 46    0.95     0.39  1.47729312 -1.84675621  9.29761905   3.33982543
## 47    1.89     0.66  1.23806234 -0.49742826  0.76789021  -1.62641351
## 48    1.52     0.85  0.90687576  1.46314822 -4.79922175  -1.96551479
## 49    0.49     1.18  0.86847498 -0.08937879  1.13539597   1.54892878
## 50    1.14     0.92  2.18426389  9.53582379  2.94134157  -3.03635068
## 51    1.29     1.42  1.39592161 -4.08529364 -1.55406511   0.21317260
## 52    0.51     0.43  0.85337320 -2.40626788 -5.61094494  -5.94880070
## 53    0.33     0.51 -0.17309551 -1.55929699 -3.33900593   1.98876930
## 54    0.82     0.86  0.84141354 -0.11843184  0.92884896   7.24172211
## 55    1.69     0.40  1.56075161 -0.10737951  0.43909774  -3.03051911
## 56    0.18     0.54  0.85162277 -1.14788420 -4.91675650  -1.80895654
## 57    0.15     0.45  2.27423367  1.47061738 -1.99030043   1.28061110
## 58    0.20     0.23  1.22769960 -0.64539381  1.74795964   1.05737947
## 59    0.16     0.19  1.54177609  2.19652210 -0.16421398   1.07558352
## 60   -0.03     0.26  0.07789160  0.84142417  5.49756437  -3.10554510
## 61    0.54     0.19  1.53695415 -0.12071934  2.12880787  -0.85917071
## 62    0.64     0.31 -0.19782394  9.39723505 -2.98279608  -0.27128862
## 63    0.08     0.54  1.05273965 -4.64658129 -3.40737154   0.70273538
## 64    0.01     0.15  1.20586526 -2.58996052 -2.21177945  -3.52667517
## 65   -1.10     0.21  1.03263251 -0.97611716  0.05125905   0.70000778
## 66   -0.93     0.24  0.84552756  1.02918402  2.49119436   9.66247007
## 67   -0.67     0.16  1.22319232 -0.38284541 -0.18745314  -5.73320186
## 68   -0.72    -0.18  1.31228568  0.81235775 -1.35845749   1.68858338
## 69    0.10     0.35  1.27465143  1.41032653 -2.11969283  -0.81557678
## 70    0.47     0.11  1.01432364 -1.41202713  2.14614537   2.60760056
## 71    0.20     0.34  0.56582783  1.58944154  3.16110194   1.24178760
## 72    0.52     0.32  0.45162549 -0.09141441  5.31011568  -3.78663624
## 73    0.89     0.35  0.45772224  0.94023678 -0.87642419   0.92647495
## 74    0.76     0.39  0.37152025 10.79017408  0.91364574  -0.71968862
## 75    0.07     0.38  0.68240513 -4.67303828  0.33878505   0.51039278
## 76    0.64     0.10  0.62266938 -1.98677574 -1.56595646  -2.69355314
## 77    0.57     0.21  0.55411112  0.20788541  3.98604294  -1.64876721
## 78    1.38     0.14  0.76113097  0.62671631  9.15088438   8.95109197
## 79    1.87     1.11  0.88951407 -0.05857130  3.13151313  -1.75748165
## 80    0.51     0.64  0.42032018  0.84195186 -0.44965392  -4.88540843
## 81    0.70     0.13  0.96489399  1.53192225  0.83231831   3.53501020
```

```
## 82    1.52     0.09 -0.06170365  0.14670141  5.99456412   3.00576348
## 83    0.89     0.58  0.78859072  2.50604526 -6.10665274   1.66442383
## 84   -0.49     0.19  0.31601615 -1.14352408 -2.43261012  -5.32255817
## 85   -1.08    -0.16  0.58919697  0.08680447  0.41986316   3.00956586
## 86    0.01     0.30  0.41659107  9.18591450 -3.52036339  -1.56439746
## 87    0.88     0.34  0.53779762 -4.99752137  0.25145792  -0.98693759
## 88    1.26     0.54  0.50195679 -2.45193646  2.56697620  -2.04485488
## 89    0.92     0.72  1.31556145  0.39623950  1.52973620   0.26187804
## 90    0.45     0.35  0.71028792  0.56059018 -1.97816840   3.82835821
## 91    0.80     0.06 -0.01218789 -1.56957553 -4.91974695   0.48156400
## 92    0.40     0.09  0.47985497  0.66959161 -0.75332673  -0.18597997
## 93   -0.67     0.08  0.63940824  0.80620751  0.27702366  -3.08155368
## 94   -0.01     0.09  0.86831138 -0.58280691  5.22680811   5.93759243
## 95    0.68     0.09 -0.63456596  2.33050705  2.20530323  -0.84455922
## 96    0.30     0.14 -0.22265399  0.66682486  4.94220396  -2.56229762
## 97    2.09     1.05  0.55074309  1.51632722  0.62172615   3.35211675
## 98    0.48     0.71 -1.07032062 10.63354630  0.98277708  -2.83098001
## 99   -0.04     0.22  0.72895760 -5.75980483 -0.45288109  -1.05028415
## 100   1.24     0.02  0.45137694  0.11711548 -4.30742426  -2.56633951
## 101   0.80    -0.01 -0.24642640  1.82817197  1.56281610   0.33577078
## 102   0.28    -0.59  1.56539350  7.77970895 12.30516409   1.22703949
## 103   1.56     0.02  2.72275184  7.86898620 -4.85544519 -12.98853952
## 104   2.23     0.30  3.69230419  6.26515134  7.08393531   0.95406957
## 105   2.74     0.23  1.86086177  3.60838674  9.38764852   5.31905996
## 106   4.34     0.45  2.04700078  2.44804084  0.53712103   7.95680140
## 107   3.23     0.94  1.93363132  3.60471084  5.54038545  -0.15446855
## 108   3.28     0.81  0.75594732  2.42301898  0.11623983   1.04611758
## 109   0.96     1.06  0.14615341  0.79888939 -1.35580524   1.96850394
## 110   2.58     0.78  1.01260155  6.11091527 10.55509150  -1.18690119
## 111   2.53     0.48  0.78783149 -4.44266853  7.03001580   0.82489146
## 112   2.94     0.93  0.39491893 -1.88702771  5.31686186  -5.84182575
## 113   1.51     0.60 -0.54858662 -0.36117133  1.21260130   2.31707317
## 114   4.10     0.44 -0.07124556  0.63188436  1.10475617   7.82926103
## 115   0.60     0.83  0.42538994 -0.07272637 -3.55196951  -3.76511226
## 116   0.78     0.72  1.03568227  2.17129722  5.17071063  -1.15577889
## 117   0.66     0.89  1.03537163  5.55736831  3.39898441   0.16704191
## 118  -0.64     1.14  0.44358930 -0.62514374  2.32775996   3.73404872
## 119   0.64     1.20  0.90287551 -1.57579714 11.28526646  -0.78982316
## 120   0.02     1.17  0.65494271 -1.58696176 -0.33403964  -2.26151895
## 121   0.87     0.78  0.13906080 -0.78251988 -0.71283860  -0.51899373
## 122   1.82     0.58 -0.06858192  3.62262287  2.99274486   1.21730309
## 123   1.83     0.99  0.64037333 -4.00296456 -0.78514822   1.31004367
## 124   1.74     0.95  0.31019759 -0.94476518  4.37837438  -7.05200678
## 125   1.41     1.73  0.37734934  0.34866423 -1.12425896   3.89995439
## 126   0.52     0.59  1.15026429  1.15879113  3.22002723   9.46806175
## 127   0.59     0.69  0.66661561 -0.41943515 -0.94651825  -4.19758038
## 128   0.21     0.13  1.05905870  0.77133802 -2.42979300  -0.39070676
## 129  -0.70    -0.73  0.68123036 -0.58921178 -0.71596188  -0.60236744
## 130  -0.95    -0.37  0.62754522 -0.19777058 -1.37954321   4.84109647
## 131  -0.97     0.16  0.40374834 -0.60099174 -3.51911178   0.38983734
## 132  -0.56     0.53  0.51381180 -0.82373659  1.25975869  -3.35431173
## 133   0.45     0.52 -0.04354646 -0.02911452 -2.18528624  -1.14305507
## 134   0.21     0.55 -0.55844107  5.62750093 -2.58214761  -1.21233357
## 135  -0.06     0.76  0.83802085 -3.56546502 -1.56303360   0.86543236
```

```
## 136   0.05     0.69  0.81508953 -1.19693925 -2.84479078  -4.38146142
## 137  -0.95     0.57  1.11502991 -0.52824210 -0.44498160   3.64077670
## 138  -1.84     0.51  0.86748171  0.04564279 -4.68215429  12.41217799
## 139  -1.93     0.04  1.32663871 -2.09171932 -0.77286016  -6.09217172
## 140  -0.72    -0.07  1.01154138  0.75492063  1.83780630  -1.25042017
## 141  -0.14     0.28  1.32351877  6.18178159  2.85877972  -0.85097692
## 142   0.37     0.35  1.13871710 -0.49983753  3.72897404   3.26146663
## 143   0.50     0.21  0.85287260 -1.05837111  0.98531425   0.59179467
## 144   0.59     0.33  0.88304173 -0.22575951 -5.09118945  -4.27022739
## 145   0.74     0.40  0.65668677  0.39688771 -3.98330485   0.07595636
## 146   0.07     0.31  1.65050400  6.89789159  0.78770021  -0.47609191
## 147  -0.52     0.78  1.32774898 -4.33303935  4.26086201  -0.06932890
## 148  -0.47     0.36  1.01823747 -0.49963319  2.55143119  -2.31719162
##         pimpf-2 tcu-2      elec-2  confidence-2    brl_usd-2 selic-2
## 2    -8.1548600  -2.4  1.02837659   0.101156983  -7.28494480    0.89
## 3    -7.2645740   1.3 -1.18937456   7.484368092  -1.71987345    0.75
## 4     1.2572534  -1.0  1.64164716  -3.384651545   6.60774903    0.82
## 5    10.9837631  -0.1  4.66654020   0.346673154   3.82651661    0.71
## 6    -6.9707401   1.0 -1.62338503  -1.175828838   6.90038071    0.74
## 7    10.4532840  -0.2 -3.12138120  -0.429316161  -0.04946332    0.64
## 8    -4.1038526   0.2 -0.76609617  -1.102556206   1.42029990    0.68
## 9     6.3755459   1.2 -1.67268944  -2.653213752  -0.62457305    0.69
## 10    6.7323481   0.0  3.51644068   1.273192578  -0.32406953    0.54
## 11   -7.3076923   1.0  1.29639591   1.952113210   0.03940887    0.61
## 12    8.1327801   0.0  0.35579629  -1.047217747   3.74236754    0.55
## 13   -6.2164236   0.1  2.24362366   1.327572171  -3.03303588    0.55
## 14  -12.0294599  -3.6 -2.27460925  -0.778691057  -2.70204122    0.60
## 15    2.4186047   1.3  1.59406858   3.301152289  -0.64396036    0.49
## 16   -6.8119891  -0.6 -0.94091276  -3.551401869   1.93933870    0.55
## 17   11.0136452  -0.2  1.14718729  -2.713178295  -0.60103318    0.61
## 18    4.2142230   0.9  0.55148015  -6.201002442   6.51141872    0.60
## 19    3.0328559   0.4 -0.79939980  -0.637117216   3.92230459    0.61
## 20   -3.1071137   0.0 -1.86986569  -5.729453944   3.37246050    0.72
## 21    6.2447257   0.7  0.18603168  -2.698749360   3.58998996    0.71
## 22    3.7331215   0.1  2.42718447   2.781118461  -6.00784181    0.71
## 23   -4.2879020   1.1 -0.22790252   1.828287260  -1.22903023    0.81
## 24    4.9600000   0.9  2.24269955  -0.883366849   5.55404178    0.72
## 25   -5.7164634  -1.1  1.34809211  -1.043402652   0.76151960    0.79
## 26  -15.1172191  -3.0 -0.91182365  -3.536647873   3.57386849    0.85
## 27    2.7619048   1.0  1.83031651   3.529679672  -3.83394484    0.79
## 28   -0.3707136  -0.5  3.40863952  -7.779162695  -3.01367514    0.77
## 29    5.4883721  -0.7 -3.32268984  -4.396565432  -1.19342291    0.82
## 30   -1.3227513   0.5 -1.68119397  -8.956340956   0.13420417    0.87
## 31    5.8981233  -0.2 -1.24267529  -1.927292656  -1.63062902    0.82
## 32   -6.6666667  -1.0 -3.51406650   2.030362299   2.94745447    0.95
## 33   10.0361664   0.7  0.37374755   0.903696942  -1.22639845    0.87
## 34    1.8077239   0.6  1.80632213   7.580966166   9.44171505    0.91
## 35   -0.6456820   0.1  0.89232445  -2.606794484  -0.27750571    0.95
## 36    3.4118603   1.1  3.09808459   0.146779485   4.74300213    0.84
## 37   -8.6410055  -2.2  2.12219451  -2.620915596   3.75463958    0.96
## 38  -12.1238177  -2.8 -2.71788235  -0.230190350   0.22970327    0.94
## 39    0.4892368   1.0  2.30935288   0.177478037   8.11511440    0.82
## 40   -4.9659202  -1.3 -0.09568674  -5.341482859  11.45706641    1.04
## 41   12.6024590  -0.9 -2.35762175  -4.959760434  -6.68454200    0.95
```

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## 42   -5.8234759  -0.4 -0.40745492  -9.639621898   6.18443034    0.99
## 43    4.7342995  -0.7 -3.52299417  -1.296720061  -2.39765898    1.07
## 44   -0.5535055  -0.8 -2.45536883  -6.657098697   9.39746607    1.18
## 45    3.1539889   0.8 -1.20223272   0.130100532   7.44680851    1.11
## 46    2.2482014   0.4  2.83300739   1.027639972   8.94380297    1.11
## 47   -3.3421284   0.8 -0.04490346   3.788144511  -2.86994613    1.11
## 48    3.0937216   0.3  3.79208287  -3.627351583  -0.21512622    1.06
## 49   -9.9735216  -0.4 -0.13239300   1.893629456   1.41042624    1.16
## 50  -11.7647059  -4.0 -1.41491396   2.145233452   3.53465499    1.06
## 51   -1.2222222   1.1 -0.69562969   6.951931716  -1.56350502    1.00
## 52   -0.5624297  -0.9  0.84893623  -6.216528405 -10.57300829    1.16
## 53   10.2941176   0.6  1.85400367  -1.825103572  -3.03796757    1.06
## 54   -0.8205128  -0.1  2.08898466   3.615419708   4.18236624    1.11
## 55    3.9296794   0.3 -4.02294569   7.925151348 -10.71915426    1.16
## 56    1.5920398   0.1 -2.84354058  -0.387557369   0.90988408    1.11
## 57    2.2526934   0.4 -0.78561917   2.436776902   0.04014328    1.22
## 58    3.8314176   1.5  1.17836532   6.896551724   0.18211563    1.11
## 59   -2.4907749  -0.2  1.72706532  -0.906965872  -2.00579246    1.05
## 60   -0.5676443   1.0 -0.38336159   4.076240800   6.77880836    1.04
## 61   -4.0913416  -2.2  1.45557359   0.389845875  -4.05170637    1.12
## 62  -10.7142857  -0.8  0.06967023  -7.658267859  -4.05401258    1.09
## 63    0.8888889   0.5  1.51620639  11.295843521  -0.88600307    0.87
## 64   -2.6431718  -0.4 -1.35385710  -3.884007030   2.22996741    1.05
## 65   12.6696833   0.1  4.40313112  -0.338270251   0.94702948    0.79
## 66   -7.2289157   0.6 -2.75242934  -5.063755619   1.41659891    0.93
## 67   13.6363636  -0.4 -3.23357849  -3.314329887   1.98883784    0.81
## 68   -1.8095238   0.4 -0.10745643   4.717169698  -5.36642883    0.80
## 69    4.0737148   0.2 -1.92580154  -3.149456003   0.52394492    0.80
## 70    4.9394222   0.7  1.30016051  -1.783602680   0.66423010    0.64
## 71   -3.8188277   1.1  3.01853906   3.150396308   3.43815116    0.64
## 72    2.4007387   0.6  0.83826809   1.118568233  -0.46699020    0.57
## 73   -4.7790803  -0.7  1.24822046   5.290496345   1.42287642    0.54
## 74  -10.6060606  -2.6 -0.55489994   6.851818016  -4.40224950    0.58
## 75    1.5889831   1.9  1.13366662   3.086525308   2.60927320    0.47
## 76   -6.1522419  -0.1 -2.21195856  -4.088911006   2.43195759    0.53
## 77   11.6666667   0.4  4.94779034  -4.929090280   4.73338950    0.52
## 78    0.2985075   0.4 -1.00226239   3.238129889   7.35239190    0.52
## 79   -2.3809524  -0.3 -3.51885981  -8.370044053   3.17953110    0.52
## 80    7.8252033  -0.5 -2.69974276  -0.500000000  -2.61724424    0.54
## 81    5.1837889   0.9  0.79836662   0.869733282  10.13238154    0.57
## 82    2.5985663   1.7  1.40490288   2.308871431  -3.17798147    0.47
## 83   -7.6855895   0.2 -0.02560885   1.048787340  -7.14910199    0.54
## 84    5.5818354  -0.6  3.47088809   6.106940969   3.91703209    0.49
## 85   -6.5412186  -1.6  0.03465861  11.615720524   0.29771921    0.49
## 86  -12.9434324  -3.0 -1.31904573   0.657276995  -5.75344587    0.54
## 87    3.5242291   1.4  4.44388715   8.356654229   2.37175800    0.49
## 88   -1.9148936  -0.5 -1.15974740  -9.943324485   4.23232296    0.47
## 89    2.3861171  -0.1 -0.03886891  -3.043097268   1.24740125    0.52
## 90    2.8601695   1.3 -3.46310878  -3.861638321  -0.11661216    0.54
## 91    9.1658084  -0.3  1.90821438  -8.230065806  -2.75373721    0.47
## 92   -5.6603774   0.4 -5.03940120   3.296703297  -1.75644639    0.57
## 93    8.9000000   1.0 -0.24713197   3.299675442   9.92482002    0.50
## 94    2.9384757   0.6  0.77191884  -2.085878862   0.62592136    0.46
## 95   -4.6387154   1.0  1.60447182  -0.329797665  -3.84984870    0.48
```

```
## 96    5.7998129  -0.2  4.59986756   6.099087820   5.49269389    0.38
## 97   -9.3722370  -1.3  1.76292978   2.208361430  -4.57688119    0.37
## 98  -12.4878049  -2.0 -2.36887443   0.008246743   5.92541128    0.38
## 99    4.0133779   1.6  1.29160335   8.674857755   5.36906463    0.29
## 100  -1.5005359  -1.4 -0.88315711  -5.470824797  15.56212623    0.34
## 101  -1.1969532 -17.7  0.42720437 -10.122009953   4.39198938    0.28
## 102 -22.6872247   3.4 -9.41928584 -13.530409931  -0.01289990    0.24
## 103  18.0911681   6.2 -3.05925290   3.728568478   0.91601084    0.21
## 104  10.1326900   5.7 -0.98272617   2.399681370  -4.98045805    0.19
## 105  16.1007667   3.7  5.87100562  -0.213924543   5.15117151    0.16
## 106   3.2075472   3.8  3.62565687   5.593451569   3.09649588    0.16
## 107   1.5539305   2.4  2.82860201  -0.692137320   2.32442687    0.16
## 108   2.0702070   0.1  6.37390960   3.754297928  -7.62579706    0.15
## 109  -7.3192240  -1.6 -3.47824061   0.053739364  -2.53231040    0.16
## 110  -7.6117983  -2.1  1.76196568   3.920866529   5.37326071    0.15
## 111  -1.6477858   0.4  2.21057375   0.120596089   0.99172648    0.13
## 112  -3.4554974  -1.3 -3.68041213  -2.865009034   3.02191840    0.20
## 113   8.7852495  -1.6  5.18948611  -7.041629761  -5.15561641    0.21
## 114  -5.5832502   1.7 -2.29953505   0.905192949  -3.17231168    0.27
## 115   8.7645195   1.5 -4.38849427   1.340887630  -4.39636058    0.31
## 116  -0.5825243   0.7 -0.87286993   3.410361536   2.38723608    0.36
## 117   4.9804687   0.4 -0.58868634   0.910073887   0.42374536    0.43
## 118   1.2093023   1.4  1.78398149   2.384141441   5.75767593    0.44
## 119  -2.0220588   1.9  2.55451256  -4.613640328   3.74347282    0.49
## 120  -1.8761726  -0.4  1.53505113  -0.018286550  -0.40940026    0.59
## 121  -3.8240918  -2.2 -1.70904054   2.423411065  -0.70115495    0.77
## 122  -8.2504970  -1.7  2.50065681  -3.258928571  -3.99827954    0.73
## 123  -2.3835320   0.4 -0.89244105  -3.968620212  -4.06959379    0.76
## 124  -0.3329634  -0.3 -1.60816307   1.028351754  -7.81505410    0.93
## 125   9.5768374  -0.3  6.75045999  -0.732496195   3.82715528    0.83
## 126  -3.8617886   1.6 -3.27483547   1.456636320  -3.86703263    1.03
## 127   8.5623679   0.5 -2.68681586  -2.144139038  10.76708331    1.02
## 128  -0.8763389   0.9 -2.64209275   1.911196911  -0.94703479    1.03
## 129   5.2062868   0.7  0.71814163   1.117635916  -0.18119434    1.17
## 130   3.3613445  -0.5  2.15361482   4.402397902   4.39517998    1.07
## 131  -4.6070461   0.7  0.44870730   2.485196483  -2.76729560    1.02
## 132   0.2840909  -0.7  0.49397306   2.241092533   0.70580626    1.02
## 133  -4.2492918  -1.4  0.55269409   5.180238034  -1.44327949    1.12
## 134  -9.2702170  -3.5  1.11334612   2.067730381  -2.26946004    1.12
## 135  -1.7391304   1.1 -1.57529493   2.711756261   2.12799341    0.92
## 136  -3.2079646  -0.2  1.24562269  -1.056064606  -2.44661238    1.17
## 137  13.6000000   1.7  6.11666937  -1.820750275  -1.56895941    0.92
## 138  -7.4446680   0.0 -1.81344883  -2.302158273   1.90396192    1.12
## 139  13.8043478   0.2 -3.83201515   2.495499918  -5.43049477    1.07
## 140  -2.5787966   0.6 -1.19309626  -0.646603337  -1.61250156    1.07
## 141   3.6274510   0.6 -1.51699883   5.270769725   3.80518467    1.14
## 142   5.2980132   1.8  3.37118777   1.236452450   1.74140979    0.97
## 143  -4.4923630  -0.1  2.43672125   0.082931242   0.99660475    1.00
## 144   0.6585136   0.3  3.53216269  -2.267419962  -2.41254524    0.92
## 145  -3.9252336  -0.9  1.35076442   2.867273008  -1.90885327    0.89
## 146  -9.7276265  -2.9  1.16563103  -0.157350517   2.31784659    0.97
## 147   0.9698276   0.8 -0.80272800   3.729831144   0.60166771    0.80
## 148  -1.4941302   0.1 -1.12309170  -4.123860512   0.25889578    0.83
##        saving-2       cred-2 net_debt_gdp-2  primary-2 current_account-2
```

```
## 2    1.41913825  2.280031359         -0.29    6270.66           1302.2
## 3    0.56767291 -0.037808131          0.53  -24082.32          -5204.4
## 4    0.42343625  0.386339659          0.15   16501.74           7018.3
## 5    1.13086318  1.855524635         -0.89    -927.65          -1481.2
## 6    0.98082740  1.331128975         -0.76   -3797.78             -6.7
## 7    1.94675003  1.684052625         -0.73   11586.72            -15.2
## 8    1.64377332  1.544026991          0.01    -141.24           -857.7
## 9    2.32110474  0.816179226         -0.27   -2775.31           -904.5
## 10   1.23631841  1.230249789          0.09    2572.92           3767.4
## 11   1.74285471  1.108535380          0.02    1406.02           -677.0
## 12   1.14300414  1.417347673         -0.18  -10807.82          -2405.5
## 13   1.30266949  1.518042988         -0.36   17913.77          -1909.1
## 14   2.35161351  2.488141763          0.11  -27767.67            291.7
## 15   0.91137113 -0.091752106         -0.02   -7999.10          -4199.5
## 16   0.94640049  0.736719544          0.42   33282.74           7185.9
## 17   1.62658387  1.823504561         -0.19   -6531.35           -550.1
## 18   0.95091358  0.909947912         -0.26   -6828.32           -352.9
## 19   1.59976551  1.557562694         -0.63    4647.38            440.8
## 20   2.17003961  1.780328341         -0.32     252.40           2801.2
## 21   2.19602806  0.535279209         -0.39    3141.77          -8111.6
## 22   1.32275210  1.286654851         -0.22    2718.66           6404.9
## 23   1.68910972  0.748446200          0.93    8616.00            974.1
## 24   1.31840374  0.272335097          0.11  -15236.28          -2607.3
## 25   1.63583331  1.637022073         -1.04  -23556.95           1491.6
## 26   2.57273947  2.436762172         -0.08   19338.02           1089.4
## 27   0.83334452  0.070075250         -0.49   -9513.96          -9109.3
## 28   0.83542732  0.456312694          0.35   17791.08           5220.4
## 29   0.81951854  0.977270759          0.42   -1449.35            606.3
## 30   0.31797931  0.692441818          0.00  -13316.23           -654.4
## 31   0.89311036  0.962275745          0.32   27942.16           1484.1
## 32   1.05838116  0.951067096          0.38   -8945.88           2047.9
## 33   1.19574466  0.220135338          0.12    2614.66          -5679.0
## 34   0.64691365  0.947773879          0.54    9744.88           4383.2
## 35   0.76652353  1.361106970         -0.07   11030.97          -2029.6
## 36   0.64698211  0.789796207          0.15  -29219.63          -1304.1
## 37   0.94759471  1.272569771         -0.04   11812.86           -475.2
## 38   1.37861509  2.058344740          0.41    4810.02            348.1
## 39  -0.20002398  0.132992826         -0.09  -33957.05          -2619.1
## 40  -0.49843241  0.398283087         -0.20   23362.46           4636.3
## 41  -1.16039881  1.223502993         -0.71   -2539.01           1600.1
## 42  -0.32249768  0.002898439          0.76  -13205.65            194.3
## 43   0.09755894  0.705570411          0.04   20345.42           2146.3
## 44  -0.33790446  0.568948183          0.84    2422.74            303.7
## 45   0.28276708  0.293733020         -0.32     695.50          -2667.3
## 46  -0.48784974  0.797825784         -0.45   -2708.67           3594.2
## 47  -0.17931444  0.957478514         -0.44       8.35            -12.5
## 48   0.12672313 -0.230491259          1.04    4211.86          -2027.0
## 49   0.43251183  0.625778789          0.84    8036.77           1165.1
## 50   1.38596735  1.348933704          1.74   52161.77           3944.7
## 51  -1.21528513 -0.664266764         -0.30  -99641.57          -6124.4
## 52  -0.41581346 -0.493621971          0.94   50952.80           4256.5
## 53  -0.19847822 -0.671399533          2.05  -12396.43           -207.8
## 54  -0.65378021 -0.631722558          0.54  -20825.24            869.1
## 55  -0.39306297  0.221275521          0.21   28307.04           1965.3
```

```
## 56   0.06770079 -0.556210900          2.27   -8063.92          -4020.3
## 57   0.48809996 -0.430828178          0.58    2754.66          -1228.9
## 58  -0.02303935 -0.037323672          0.88    9450.88           2930.9
## 59   0.27568625 -0.114380418          0.82    4375.69           -337.2
## 60   0.21185193 -0.526432113          0.25  -66231.55          -1841.9
## 61   0.90937361  0.291802513          0.11   78729.73           2779.4
## 62   2.54392446  0.103448708          2.15   31596.54          -4117.2
## 63  -1.05856328 -1.016515123          0.32 -107449.40          -1997.8
## 64   0.28758936 -0.099737016          0.80   60179.79           6454.3
## 65  -0.17864681  0.240574394          0.27  -12420.79            414.8
## 66   0.34119241 -0.260188225         -0.05  -23955.15           -931.1
## 67   0.57383045 -0.156565601          0.52   43644.62           2534.6
## 68   1.45681094  0.410223851          0.44  -11184.05          -2038.6
## 69   0.87860042 -0.813827396          1.24   -3414.53          -3843.8
## 70   0.83274759 -0.042348219          0.42   -6608.82           3098.1
## 71   1.01348254 -0.004112586          0.66   11730.42           -367.7
## 72   0.16839968  0.159385567         -0.22  -26017.03           -936.9
## 73   1.00300304  0.385820800          0.32    5666.76          -1331.4
## 74   3.17369683  0.808833507          0.51   31412.28            329.1
## 75  -0.30867618 -0.782635494          0.06  -79261.60          -4275.3
## 76   0.29133846 -0.216230322          0.15   64353.68           1905.5
## 77   0.95853397  0.652959101          0.25    7721.74           2648.1
## 78   0.54024299  0.307427709         -0.61  -28035.19            595.6
## 79   0.70985865  0.441187036         -0.55   11123.96            871.4
## 80   1.14037479  0.681583517          0.04    5267.15           -680.1
## 81   0.87718530 -0.140051650          0.59  -10090.55          -6014.7
## 82   1.16646053  1.016383756         -0.97   13474.90           3644.2
## 83   1.46702139  0.484571286          0.99    7745.63           2456.6
## 84   0.05765773 -0.141467611          1.11  -32419.28           -760.3
## 85   0.47280863  1.113861308         -0.23   23400.03           -941.9
## 86   2.23478931  1.635126154          0.57   25531.04          -2952.2
## 87  -1.03823296 -0.857196061          0.34  -88030.35          -2434.7
## 88  -0.14580916  0.318806231          0.00   61828.17           6591.4
## 89   0.62496389  0.788447113         -0.07    3698.45           -815.7
## 90   0.01730149 -0.013137794          0.01  -25266.32            665.1
## 91   0.29724010  0.569644041          0.19   19645.07           -503.4
## 92   0.67651839  0.315962630          0.58    -301.77            652.5
## 93   0.17960831 -0.164283436          0.44   -9943.24          -8908.4
## 94   0.53944978  1.117048274         -0.94   10684.67           5443.9
## 95   1.42584914  1.073925137          0.32    7093.04           2432.1
## 96   0.31845063  0.341605218          0.47  -29985.04          -5543.1
## 97   0.62061034  1.266511434         -0.33   24756.81           5065.7
## 98   2.39098926  1.541020607          0.92   -1799.81          -1296.9
## 99  -1.15878663 -0.305074525         -1.51  -69788.48          -5348.0
## 100 -0.15668592  0.559956690         -0.64   77176.83           5937.8
## 101  1.74406974  2.838947252         -1.92    2754.32           1551.8
## 102  3.85047331  0.002483536          0.96   70647.23           5762.9
## 103  4.44503188  0.342356717          2.13   37135.51          -1798.5
## 104  2.43836724  0.751065502          2.52   57243.45           2471.4
## 105  3.17594596  1.304373268          1.88 -107610.63          -3582.4
## 106  1.34278223  1.953014844          0.54    6522.77           1646.1
## 107  1.50130825  2.107537261          0.64  -23035.07          -1268.3
## 108  0.86088004  1.510666058         -0.14  -67511.09          -1079.0
## 109  0.30009189  2.025791521          1.43   21092.32          -1447.2
```

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## 110  2.23608364  1.629495074          0.78   33697.40          -5974.4
## 111 -1.66888879 -0.067611016         -1.66 -110211.83            228.8
## 112 -0.35122181  0.680175624         -0.20   70144.40           4249.8
## 113 -0.17408273  1.521940610         -0.98  -16750.95          -4139.7
## 114  0.56015888  0.497987940         -0.83  -19274.26          11958.1
## 115  0.21874864  1.176327811         -0.17   39796.85          -1406.6
## 116  0.97309831  0.884085150          0.90   49966.67           -326.9
## 117  0.91924399  1.368497271         -0.67  -55224.95          -5345.4
## 118 -0.26060999  1.744020666         -0.58  -27011.74           1457.6
## 119 -0.44257119  2.184369844         -1.01    3795.13          -1411.9
## 120 -0.38466688  1.594749906         -0.97  -22465.89          -2381.6
## 121 -0.82359319  1.886523961         -0.23   20365.28          -2496.4
## 122  1.24231077  1.843565696          0.14   14910.89            767.5
## 123 -1.39755945 -0.004357640         -0.30 -101709.93            380.2
## 124 -0.02239488  0.946119064          0.63   98362.22           5479.2
## 125 -0.95495447  1.410617543          1.22    -841.35           -425.4
## 126 -0.40801654  0.803642936         -0.26  -34564.20           3382.6
## 127  0.45521511  1.136442206          0.51   71869.03          -5344.8
## 128  0.24842027  1.596020786         -0.88  -47387.20           4532.1
## 129 -0.61039193  0.714003227         -0.44   -6045.86          -5928.9
## 130 -1.52863835  1.459571038          0.46   50719.65          -1493.0
## 131  0.04686551  1.793288482         -0.02  -41024.97             41.6
## 132 -0.48814772  0.992364401         -0.05  -16348.82           1909.9
## 133 -0.11581830  1.282623442         -0.16   47183.81           4116.3
## 134  1.28513343  1.518887870          0.31   -8275.80          -6438.1
## 135 -2.64038848  0.166341867         -0.92 -110826.09          -1433.7
## 136 -0.51482396 -0.016591666          0.49  125465.73           4608.6
## 137 -0.01254788  0.959626765          0.27  -12270.55           5052.2
## 138 -0.03864151  0.041082497         -0.03  -34506.97           -944.8
## 139 -0.58877453  0.514048704          0.72   70496.76           1340.4
## 140  0.91812011  0.465243930          1.26   -1273.68          -1935.3
## 141  0.26109246  0.078301557          0.61  -13089.23          -4381.2
## 142 -0.38152084  1.338368836          0.39  -12979.28           3229.0
## 143  0.01622266  1.094113652          0.24   -4759.03           1818.3
## 144 -0.68149699  0.397387700          0.04  -32869.52           -373.0
## 145  0.21931563  1.158208828          0.29   52068.20          -1906.9
## 146  1.98210712  1.610341710          1.42   92303.07          -5357.5
## 147 -1.51965982 -0.195543945         -0.78 -231719.15           2415.2
## 148  0.10113107  0.345319297          0.88  150838.12            808.4
##     trade_balance-2   imports-2
## 2       -82.8931954 -13.4834566
## 3       974.6429270  -4.7859610
## 4       -67.7014110  -6.4635734
## 5        18.4329200  15.7112372
## 6        45.7639219  -0.9447098
## 7       -47.9379592   8.3049993
## 8       108.4859508  -8.3993692
## 9       -56.4333203  -2.2135250
## 10      -52.8656263   5.5010607
## 11      151.7579842  -8.8057714
## 12       96.0430608  15.8289858
## 13       25.4645295   2.1720678
## 14      -32.6693321 -15.2500456
## 15      197.1644413  14.0765504
```

```
## 16      -38.4697244 -15.8025709
## 17      -16.7166302  13.6496906
## 18       31.1013175  12.9311553
## 19      -23.7530360  -2.6167133
## 20      -59.6902267 -10.5333459
## 21      288.8392602  20.4871461
## 22      -44.2322136 -10.9467702
## 23      -11.5374459  -6.5019225
## 24       77.8172483  21.8487395
## 25      -55.6801585 -16.8193000
## 26      -12.7159091  -5.2807438
## 27      243.3624094   8.7445223
## 28      -17.7424451  -8.3954585
## 29      -30.9758309  -2.8225474
## 30        6.2239833   9.4791879
## 31       -0.6202980   4.5814468
## 32      -53.2927061  -9.7973708
## 33       75.2099323  18.5934384
## 34       -6.9519957 -10.0461072
## 35       79.9036305   6.2278192
## 36       -0.5603017  -4.7531100
## 37        9.8822000  -7.3461183
## 38      -21.0734662  -4.5959568
## 39       29.7040660  -5.3560046
## 40       -8.4163593  -8.3306030
## 41      -33.5091357  10.8396654
## 42      -10.7590789 -11.7298953
## 43      -58.1995442  -3.7688238
## 44     -108.6145272   7.3716845
## 45    -1094.0225035   3.6449228
## 46      -34.1917227 -17.9153506
## 47        7.0629972   3.0075419
## 48       80.6807912   6.2862351
## 49       18.4061354 -10.1074075
## 50     -233.7369755 -16.8779275
## 51     -124.6683512  -5.8213153
## 52     -150.3343292   4.8306380
## 53       95.4776710  12.0651376
## 54      117.6402545  -8.7824911
## 55      108.3244752   5.7466443
## 56     -116.3504162  14.5180484
## 57     -378.6034718  -7.8020244
## 58      -26.2531504   9.3230032
## 59      -61.0499335  -6.6676340
## 60     -406.6780405  -4.8913799
## 61     -224.8430422   0.7261027
## 62      -86.4918200   0.5005082
## 63     -380.3958530   5.8325614
## 64     -324.9579832 -10.6263551
## 65      140.6425103  22.9925335
## 66       -6.9202111 -15.4843046
## 67       20.2061305  13.2136467
## 68      -32.6562890   3.3372017
## 69      -29.5550062  -0.9767342
```

```
## 70      -44.8441247  11.5633417
## 71      -21.5800636  -3.7665942
## 72        2.5963489   2.5616257
## 73     -256.5309081  -4.0757831
## 74      -78.1239475  -4.3301969
## 75      472.7097768  13.4655995
## 76      -36.6624101   0.4880557
## 77     -331.4728353  -3.3959112
## 78      -36.7012011   1.8890312
## 79       30.6199305  -5.3041218
## 80      -32.1412730   7.8550437
## 81     -171.0107035  28.2351729
## 82      153.3195259   1.7189847
## 83     -148.8008721 -24.3341745
## 84      -28.4810127  14.1647848
## 85     -154.7891723   4.3493920
## 86     -464.5130641 -22.8615727
## 87     -302.9453929  27.8948864
## 88      -69.1337015 -21.9557298
## 89     -122.7504421   3.6872327
## 90      118.0612711   5.1317243
## 91      -26.3577270   9.6691232
## 92     -128.6446469 -11.7705878
## 93     3237.8727634  33.8392833
## 94      -62.7743530  -7.1779957
## 95      -56.9120000  -1.4645113
## 96      519.2536205   4.9636283
## 97      -77.4323149 -16.1860060
## 98     -157.1011027 -10.6566106
## 99    -1505.6305258  27.4178621
## 100     -67.3022809 -18.0183898
## 101     -93.0950694   9.4935095
## 102   -2494.2815249 -21.6545087
## 103     -65.2336334  12.8907320
## 104     298.8814515 -18.7635154
## 105      -6.2023891  10.9199031
## 106     -23.1897363  -3.0629120
## 107     -26.9453554  10.4653839
## 108     -29.2234761   1.4409470
## 109    -132.2980262  12.1505452
## 110     652.6885667  29.6819654
## 111       3.9449944 -13.7383209
## 112     -46.1343592  -4.8591200
## 113      -4.7944609  48.7657434
## 114    -416.3746970 -30.5175384
## 115     -26.2675476   9.2224958
## 116       1.0745098  14.6091032
## 117     -21.2403973 -10.6571057
## 118     -20.5078943  11.5762788
## 119     -93.1087906   1.3779654
## 120    -599.2805755  -2.5451642
## 121     358.7896254   7.3847343
## 122     -93.6381124  -4.9941258
## 123    1118.9447701  -2.7004212
```

```
## 124    -116.7392295  -5.4470931
## 125     310.4491154  17.1943973
## 126      31.7061489  -5.1112005
## 127    -103.2868052  18.6072754
## 128   -2755.0638298  -3.0290268
## 129     -70.1958522   1.0222126
## 130    -228.6190579   9.8595820
## 131     -13.9058450  -1.5185557
## 132      51.2043512  -9.3515276
## 133    -230.9031346  -7.2065443
## 134    -131.9937190   1.8601473
## 135     131.8865031  -8.2587955
## 136    -106.5083670 -14.1375979
## 137    6197.0528455  25.2571981
## 138     -31.6688992 -13.1284940
## 139      44.5347189  13.9897675
## 140     -24.4051899  -8.1040416
## 141     -23.6116815   1.6465043
## 142      36.5414002   8.1508941
## 143     -13.1416965  -9.9346778
## 144      -3.3929850   3.7386399
## 145     -22.5622407  -3.5293642
## 146      11.3099225   1.3442374
## 147     -78.1770251   5.6344756
## 148    -158.1932773 -10.6683073
```

9)

```
y <- y[-c(1,2)]
y = as.matrix(y)
dim(y)
```

```
## [1] 147   1
```

```
print(y)
```

```
##         [,1]
##   [1,]  0.21
##   [2,]  0.64
##   [3,]  0.36
##   [4,]  0.08
##   [5,]  0.43
##   [6,]  0.41
##   [7,]  0.57
##   [8,]  0.59
##   [9,]  0.60
##  [10,]  0.79
##  [11,]  0.86
##  [12,]  0.60
##  [13,]  0.47
##  [14,]  0.55
##  [15,]  0.37
```

```
##  [16,]  0.26
##  [17,]  0.03
##  [18,]  0.24
##  [19,]  0.35
##  [20,]  0.57
##  [21,]  0.54
##  [22,]  0.92
##  [23,]  0.55
##  [24,]  0.69
##  [25,]  0.92
##  [26,]  0.67
##  [27,]  0.46
##  [28,]  0.40
##  [29,]  0.01
##  [30,]  0.25
##  [31,]  0.57
##  [32,]  0.42
##  [33,]  0.51
##  [34,]  0.78
##  [35,]  1.24
##  [36,]  1.22
##  [37,]  1.32
##  [38,]  0.71
##  [39,]  0.74
##  [40,]  0.79
##  [41,]  0.62
##  [42,]  0.22
##  [43,]  0.54
##  [44,]  0.82
##  [45,]  1.01
##  [46,]  0.96
##  [47,]  1.27
##  [48,]  0.90
##  [49,]  0.43
##  [50,]  0.61
##  [51,]  0.78
##  [52,]  0.35
##  [53,]  0.52
##  [54,]  0.44
##  [55,]  0.08
##  [56,]  0.26
##  [57,]  0.18
##  [58,]  0.30
##  [59,]  0.38
##  [60,]  0.33
##  [61,]  0.25
##  [62,]  0.14
##  [63,]  0.31
##  [64,] -0.23
##  [65,]  0.24
##  [66,]  0.19
##  [67,]  0.16
##  [68,]  0.42
##  [69,]  0.28
```

```
##  [70,]  0.44
##  [71,]  0.29
##  [72,]  0.32
##  [73,]  0.09
##  [74,]  0.22
##  [75,]  0.40
##  [76,]  1.26
##  [77,]  0.33
##  [78,] -0.09
##  [79,]  0.48
##  [80,]  0.45
##  [81,] -0.21
##  [82,]  0.15
##  [83,]  0.32
##  [84,]  0.43
##  [85,]  0.75
##  [86,]  0.57
##  [87,]  0.13
##  [88,]  0.01
##  [89,]  0.19
##  [90,]  0.11
##  [91,] -0.04
##  [92,]  0.10
##  [93,]  0.51
##  [94,]  1.15
##  [95,]  0.21
##  [96,]  0.25
##  [97,]  0.07
##  [98,] -0.31
##  [99,] -0.38
## [100,]  0.26
## [101,]  0.36
## [102,]  0.24
## [103,]  0.64
## [104,]  0.86
## [105,]  0.89
## [106,]  1.35
## [107,]  0.25
## [108,]  0.86
## [109,]  0.93
## [110,]  0.31
## [111,]  0.83
## [112,]  0.53
## [113,]  0.96
## [114,]  0.87
## [115,]  1.16
## [116,]  1.25
## [117,]  0.95
## [118,]  0.73
## [119,]  0.54
## [120,]  1.01
## [121,]  1.62
## [122,]  1.06
## [123,]  0.47
```

```
## [124,]  0.67
## [125,] -0.68
## [126,] -0.36
## [127,] -0.29
## [128,]  0.59
## [129,]  0.41
## [130,]  0.62
## [131,]  0.53
## [132,]  0.84
## [133,]  0.71
## [134,]  0.61
## [135,]  0.23
## [136,] -0.08
## [137,]  0.12
## [138,]  0.23
## [139,]  0.26
## [140,]  0.24
## [141,]  0.28
## [142,]  0.56
## [143,]  0.42
## [144,]  0.83
## [145,]  0.16
## [146,]  0.38
## [147,]  0.46
```