Dictionary Analysis

Riccardo Ruta

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Contents

Dictionary analysis

Create the dictionary

I imported the excel file with the words for the dictionaries, excluding NA's.

```
# import dictionaries file
dict <-  read_excel("data/populism_dictionaries.xlsx")
variable.names(dict)
```

```
## [1] "Rooduijn_Pauwels_Italian"
## [2] "Grundl_Italian_adapted"
## [3] "Decadri_Boussalis"
## [4] "Decadri_Boussalis_Grundl_People"
## [5] "Decadri_Boussalis_Grundl_Common Will"
## [6] "Decadri_Boussalis_Grundl_Elite"
```

```
# create the dictionary
Rooduijn_Pauwels_Italian <-
  dictionary(list(populism =
                    (dict$Rooduijn_Pauwels_Italian
                     [!is.na(dict$Rooduijn_Pauwels_Italian)])))

Grundl_Italian_adapted <-
  dictionary(list(populism =
                    dict$Grundl_Italian_adapted
                  [!is.na(dict$Grundl_Italian_adapted)]))
```

```
Decadri_Boussalis_Grundl <-
  dictionary(list(people =
                    dict$Decadri_Boussalis_Grundl_People
                  [!is.na(dict$Decadri_Boussalis_Grundl_People)],
                  common_will =
                    dict$`Decadri_Boussalis_Grundl_Common Will`
                  [!is.na(dict$`Decadri_Boussalis_Grundl_Common Will`)],
                  elite =
                    dict$Decadri_Boussalis_Grundl_Elite
                  [!is.na(dict$Decadri_Boussalis_Grundl_Elite)]))
```

```
dictionaries <- c("Rooduijn_Pauwels_Italian", "Grundl_Italian_adapted"
                  ,"Decadri_Boussalis_Grundl")
n.words <- c(
  length(Rooduijn_Pauwels_Italian$populism),
  length(Grundl_Italian_adapted$populism),
  (length(Decadri_Boussalis_Grundl$people)+
     length(Decadri_Boussalis_Grundl$common_will)+
     length(Decadri_Boussalis_Grundl$elite))
            )

number_of_words <- data.frame(dictionaries,n.words)

kable(number_of_words)
```

dictionaries	n.words
Rooduijn_Pauwels_Italian	18
Grundl_Italian_adapted	135
Decadri_Boussalis_Grundl	77

Group and weight the dfm

```
# By party & quarter
dfm_weigh_p_quart <- dfm_group(DFM, groups = interaction(party_id, quarter))%>%
  dfm_weight(scheme = "prop")
```

Apply the dictionaries

Decadri_Boussalis_Grundl

```
# Dictionary analysis with Decadri_Boussalis_Grundl
# By quarter
dfm_dict1  <- dfm_lookup(dfm_weigh_p_quart, dictionary = Decadri_Boussalis_Grundl)
```

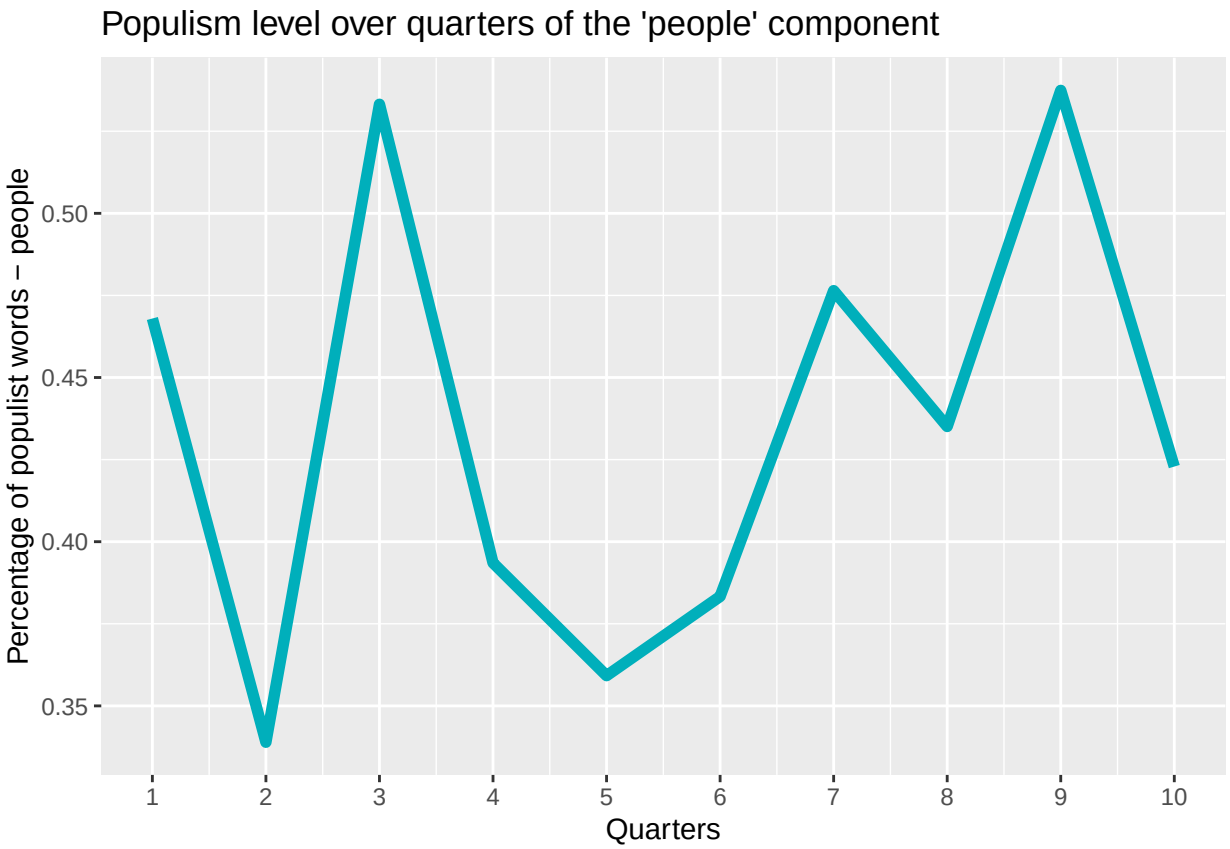
Transform the DFM into an ordinary dataframe

```
data_dict1 <- dfm_dict1 %>%
  quanteda::convert(to = "data.frame") %>%
  cbind(docvars(dfm_dict1))

# Add variable with general level of populism
data_dict1 <- data_dict1 %>%
  mutate(populism = (people + common_will + elite) * 100)
```

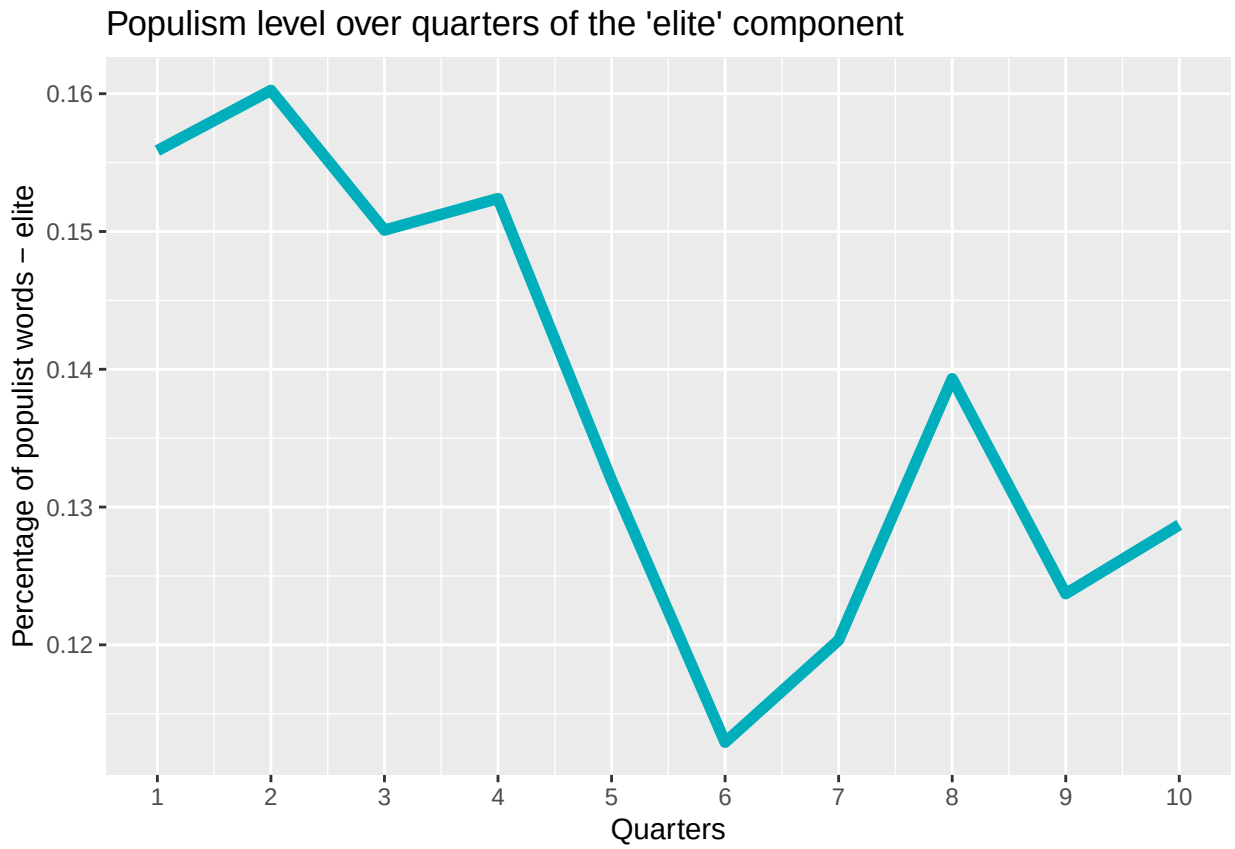
Level of populism in time

The code is only shown for the "PEOPLE" component but is identical for the others

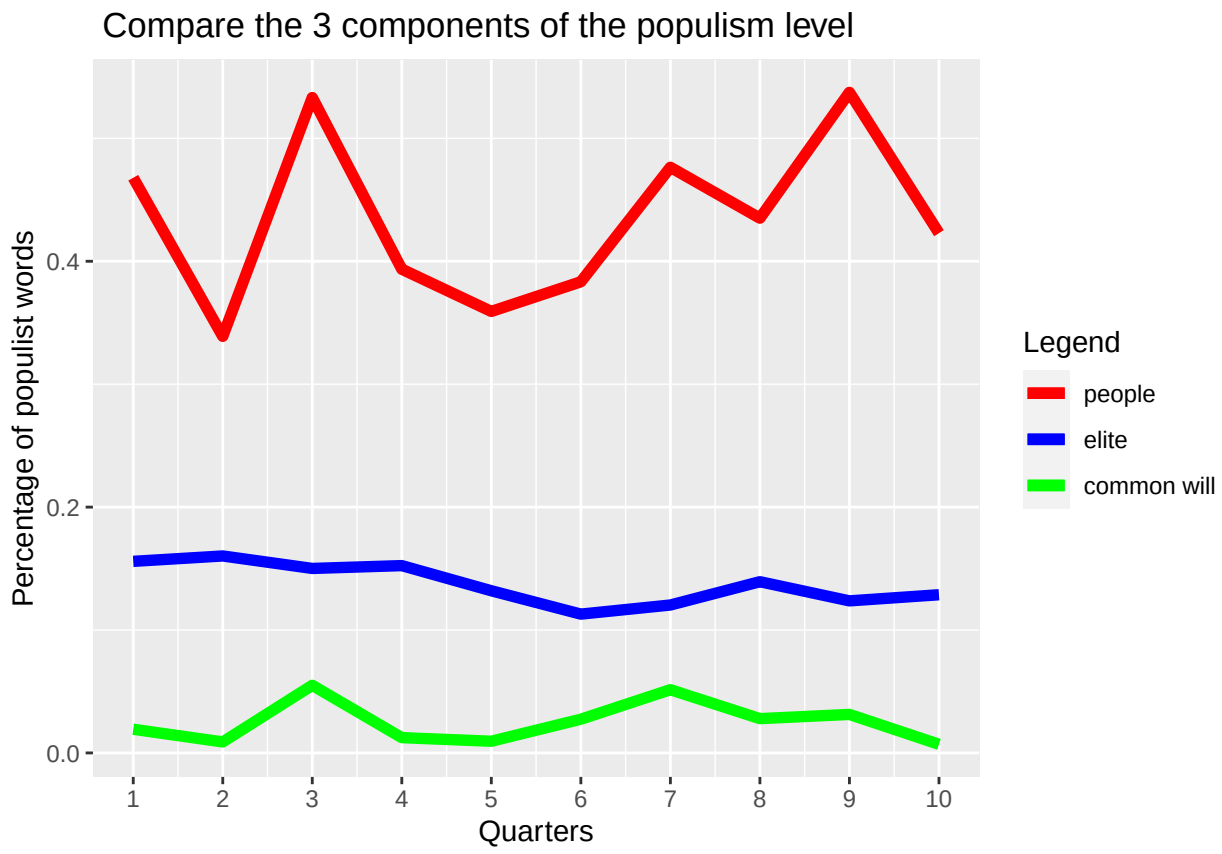
```
#Over time PEOPLE (quarters)
data_quarter_people <- aggregate(x = data_dict1$people,  # Specify data column
          by = list(data_dict1$quarter),  # Specify group indicator
          FUN = mean) # Specify function (i.e. mean)
data_quarter_people$perc <- data_quarter_people$x * 100

# plot the level of the "people" component in time
plot_people <- ggplot(data = data_quarter_people, aes(x = Group.1, y = perc))+
  geom_line(color = "#00AFBB", size = 2)+
  scale_x_continuous("Quarters", labels = as.character(data_quarter_people$Group.1),
                     breaks = data_quarter_people$Group.1)+
  ylab("Percentage of populist words - people")+
  labs(title = "Populism level over quarters of the 'people' component")
plot_people
```


Populism level over quarters of the 'people' component
Percentage of populist words – people
0.50
0.45
0.40
0.35
1
2
3
4
5
6
7
8
9
10
Quarters

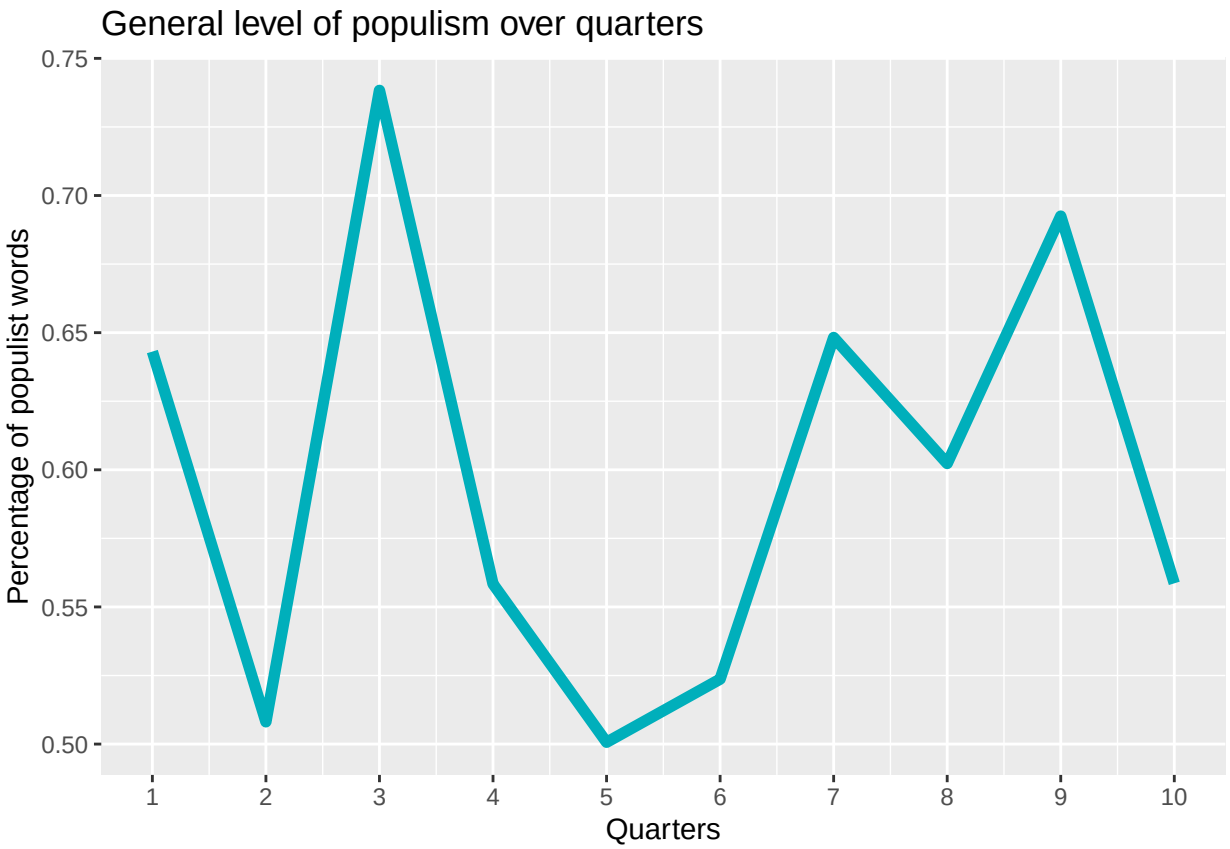

Populism level over quarters of the 'common will' component
Percentage of populist words – common will
0.05
0.04
0.03
0.02
0.01
1
2
3
4
5
6
7
8
9
10
Quarters



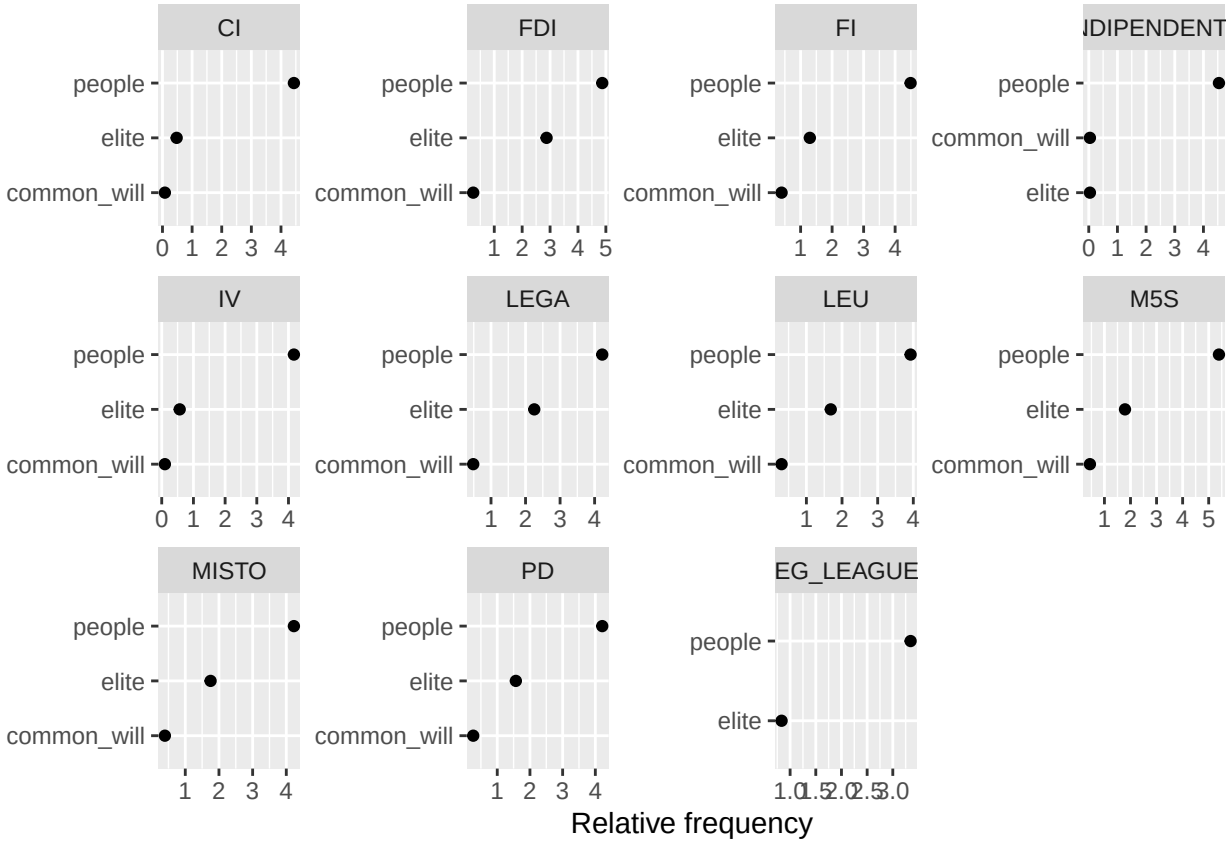

```
# compare the levels
p <- ggplot() +
  # plot people
  geom_line(data = data_quarter_people,
            aes(x = Group.1, y = perc, color = "people"), size = 2) +
  # plot common will
  geom_line(data = data_quarter_common,
            aes(x = Group.1, y = perc, color = "common will"), size = 2) +
  # plot elite
  geom_line(data = data_quarter_elite,
            aes(x = Group.1, y = perc, color = "elite"), size = 2) +
  scale_color_manual(name='Legend',
                     breaks=c('people', 'elite', 'common will'),
                     values=c('people'='red', 'elite'='blue', 'common will'='green'))+

  scale_x_continuous("Quarters", labels = as.character(data_quarter_people$Group.1),
                     breaks = data_quarter_people$Group.1)+
  ylab("Percentage of populist words")+
  labs(title = " Compare the 3 components of the populism level")

p
```




```
#Over time general level populism (quarters)
data_quarter_general <- aggregate(x = data_dict1$populism,  # Specify data column
          by = list(data_dict1$quarter),  # Specify group indicator
          FUN = mean) # Specify function (i.e. mean)
data_quarter_general$perc <- data_quarter_general$x

# plot the level of populism
plot_general <- ggplot(data = data_quarter_general, aes(x = Group.1, y = perc))+
  geom_line(color = "#00AFBB", size = 2)+
  scale_x_continuous("Quarters", labels = as.character(data_quarter_general$Group.1),
                     breaks = data_quarter_general$Group.1)+
  ylab("Percentage of populist words")+
  labs(title = "General level of populism over quarters")
plot_general
```


General level of populism over quarters
Percentage of populist words
0.75
0.70
0.65
0.60
0.55
0.50
1
2
3
4
5
6
7
8
9
10
Quarters

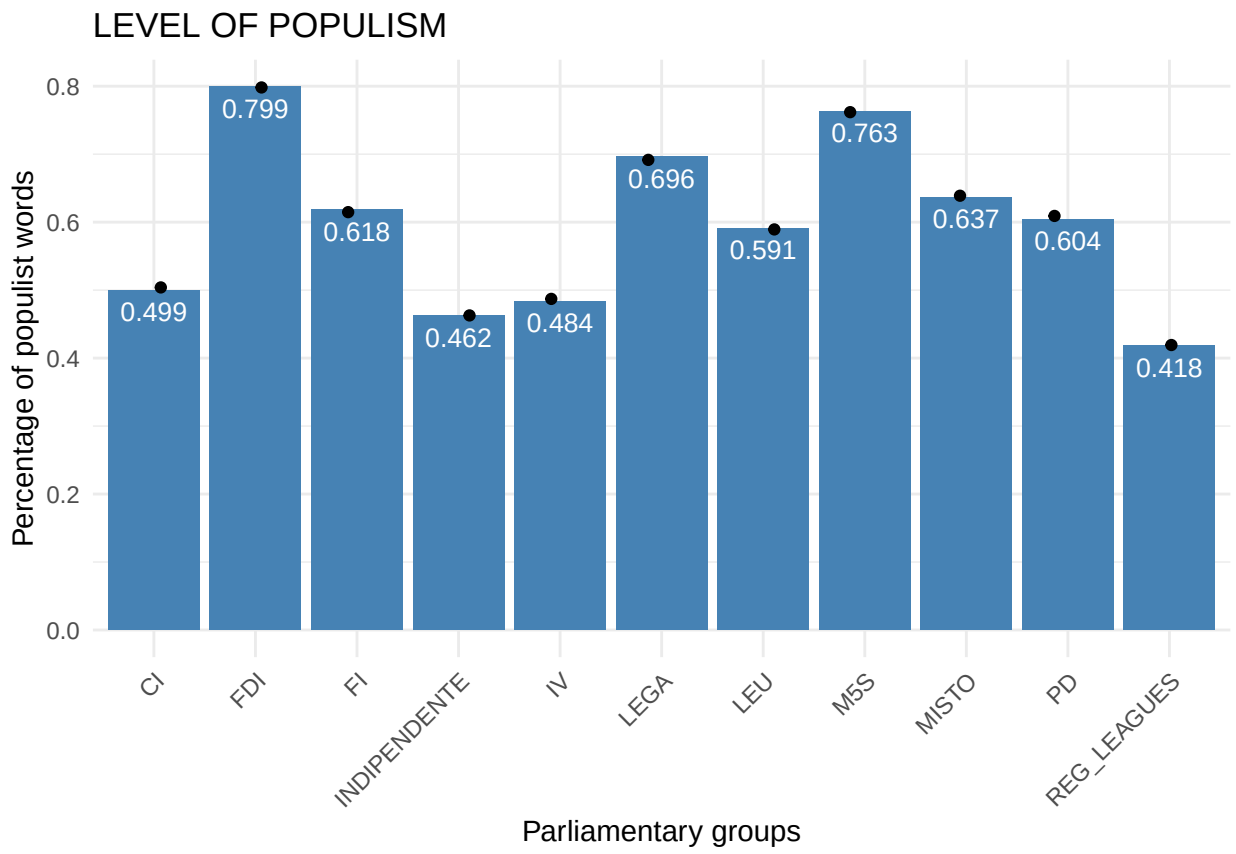
Frequencies of the 3 components of populism for each parliamentary group



Ranking of parliamentary groups according to their level of populism

The code is only shown for the main "POPULISM" indicator but is identical for the single components

```
#By party no time (quarters)

# POPULISM
data_party <- aggregate(x = data_dict1$populism,  # Specify data column
          by = list(data_dict1$party_id),  # Specify group indicator
          FUN = mean) # Specify function (i.e. mean)
data_party$perc <- round(data_party$x,3)


ggplot(data=data_party, aes(x=Group.1, y=perc)) +
  geom_bar(stat="identity", fill="steelblue")+
  geom_text(aes(label=perc), vjust=1.6, color="white", size=3.5)+
  theme_minimal()+
  geom_jitter(width=0.15)+
  theme(axis.text.x = element_text(angle = 45, hjust=1))+
  ylab("Percentage of populist words") +
  xlab("Parliamentary groups")+
  labs(title = "LEVEL OF POPULISM")
```




```
kable(data_party %>% select(Group.1, perc) %>%  arrange(desc(perc)),
      col.names = c("Party","Perc"),
      caption = "Populism")%>%
  kable_styling(latex_options = "HOLD_position")
```

Table 1: Populism

Party	Perc
FDI	0.799
M5S	0.763
LEGA	0.696
MISTO	0.637
FI	0.618
PD	0.604
LEU	0.591
CI	0.499
IV	0.484
INDIPENDENTE	0.462
REG_LEAGUES	0.418

Table 2: People

Party	Perc
M5S	0.539
FDI	0.487
INDIPENDENTE	0.454
FI	0.449
CI	0.444
MISTO	0.423
LEGA	0.422
PD	0.421
IV	0.417
LEU	0.392
REG_LEAGUES	0.335

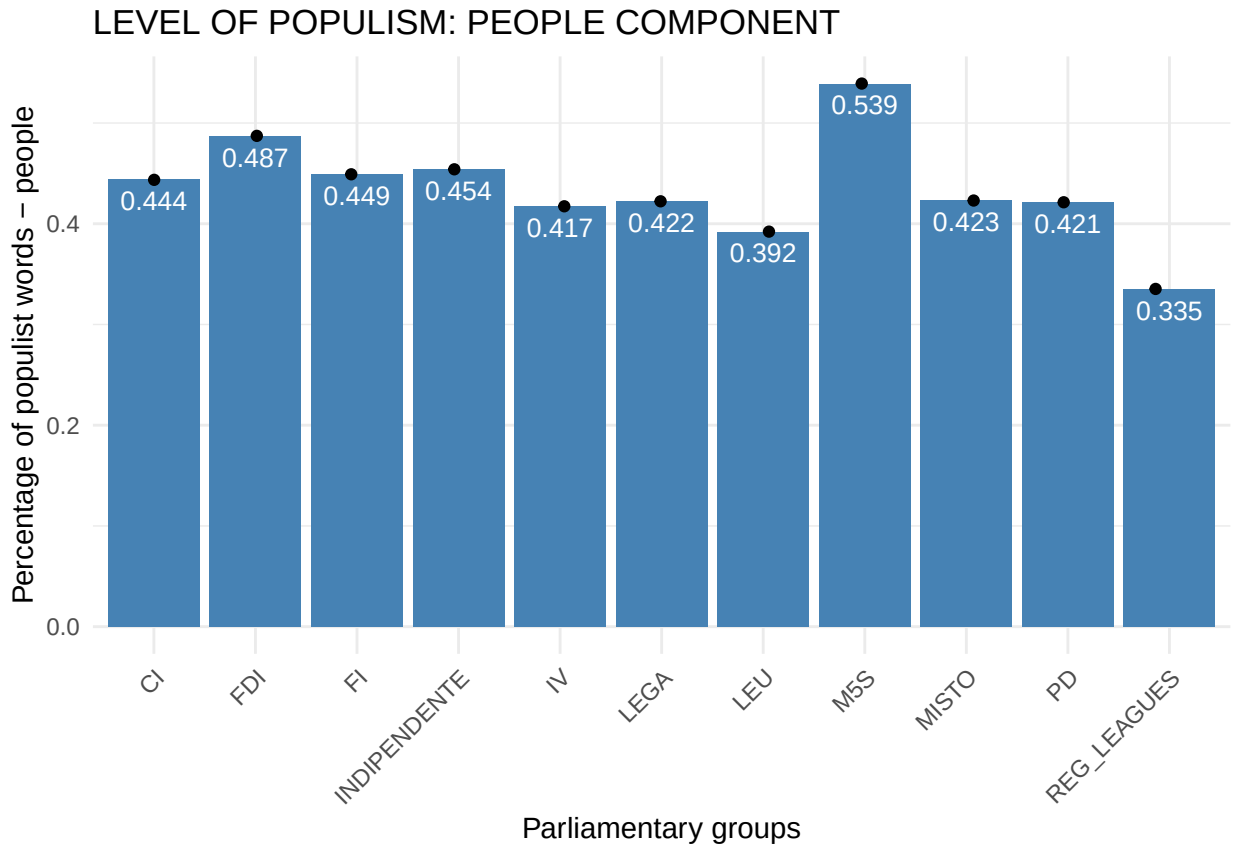


Table 3: Common will

Party	Perc
LEGA	0.048
M5S	0.044
FI	0.040
MISTO	0.039
LEU	0.030
PD	0.027
FDI	0.025
IV	0.010
CI	0.008
INDIPENDENTE	0.004
REG_LEAGUES	0.000

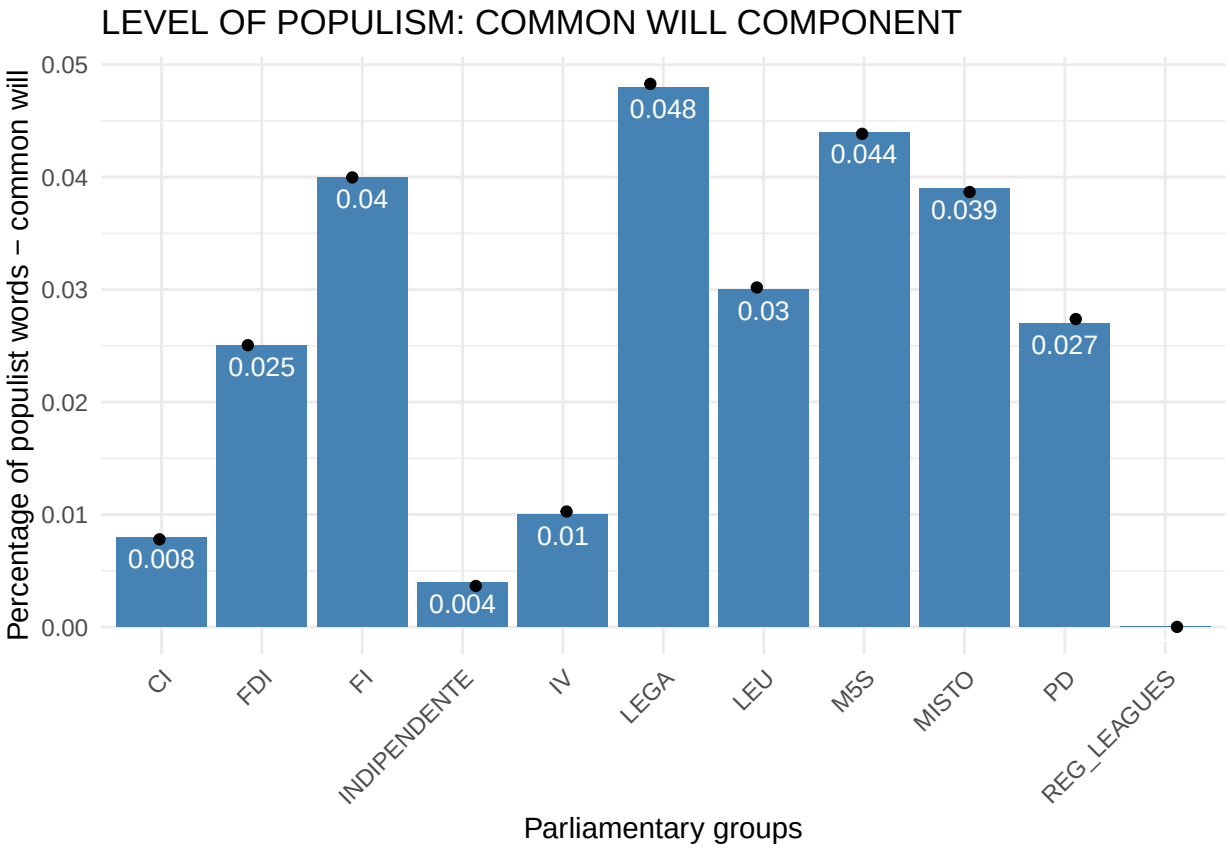
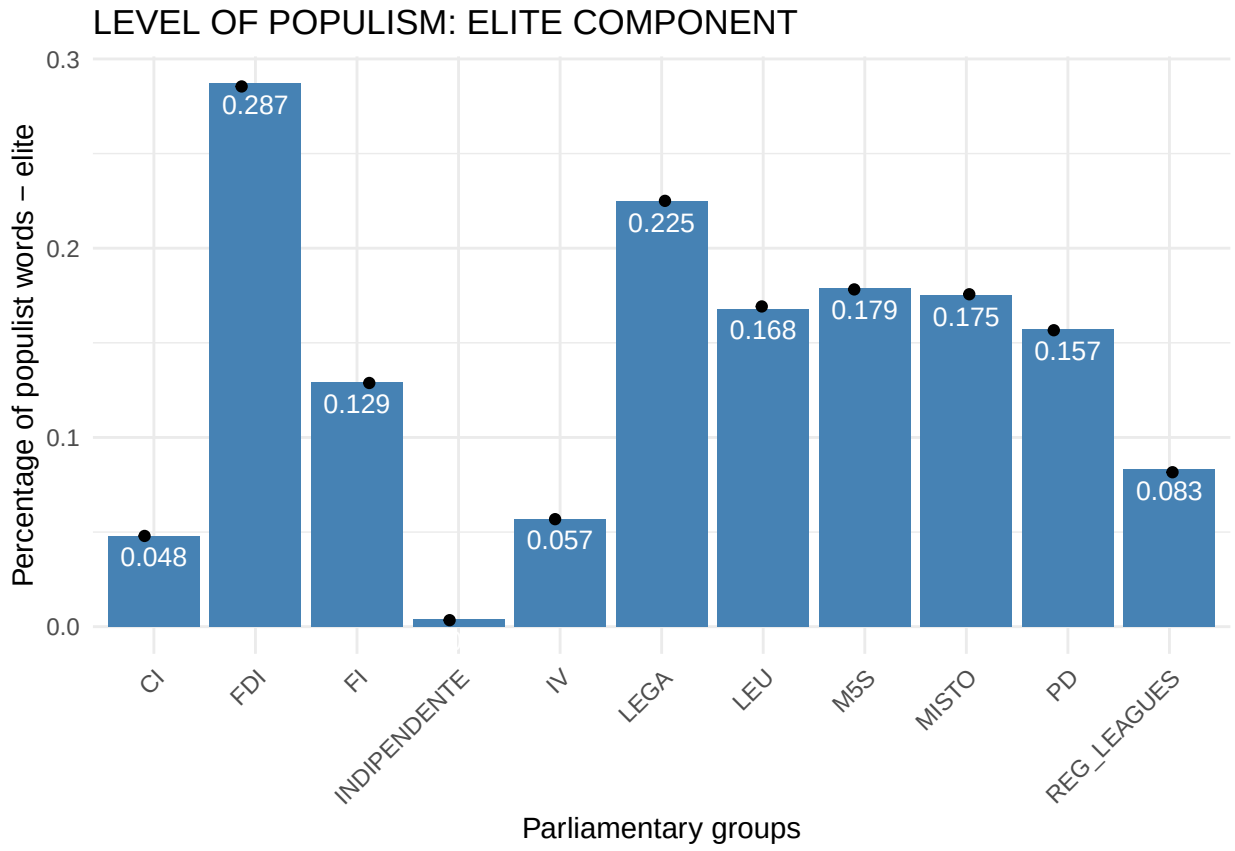


Table 4: Elite

Party	Perc
FDI	0.287
LEGA	0.225
M5S	0.179
MISTO	0.175
LEU	0.168
PD	0.157
FI	0.129
REG_LEAGUES	0.083
IV	0.057
CI	0.048
INDIPENDENTE	0.004



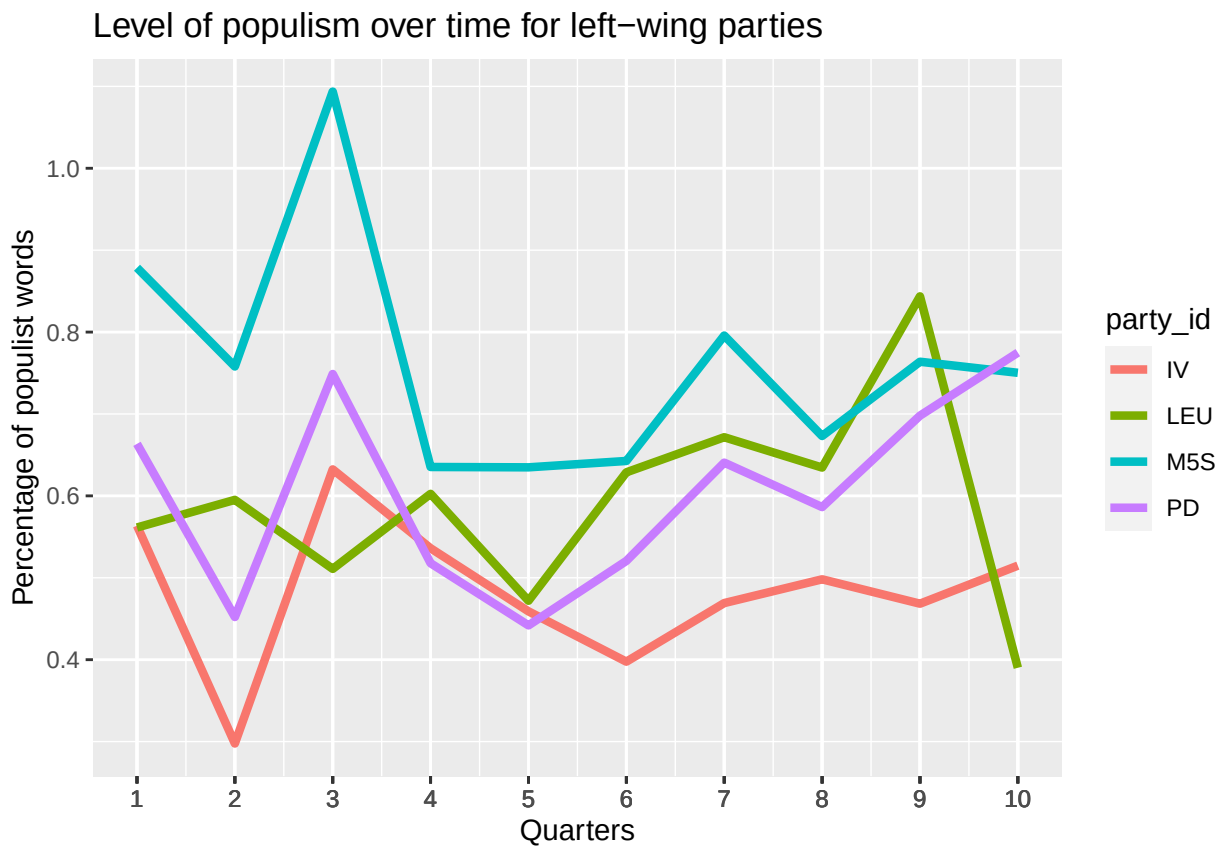
Bivariate regression for check t-test

```
# bivariate regression for check t-test
data_dict1$factor_party <- as.factor(data_dict1$party_id)
data_dict1$factor_party <- relevel(data_dict1$factor_party, ref = "PD")

data_dict1$factor_quarter <- as.factor(data_dict1$quarter)
data_dict1$factor_quarter <- relevel(data_dict1$factor_quarter, ref = "8")

a3 <- lm(populism ~  factor_quarter + factor_party, data_dict1 )

summary(a3)
```

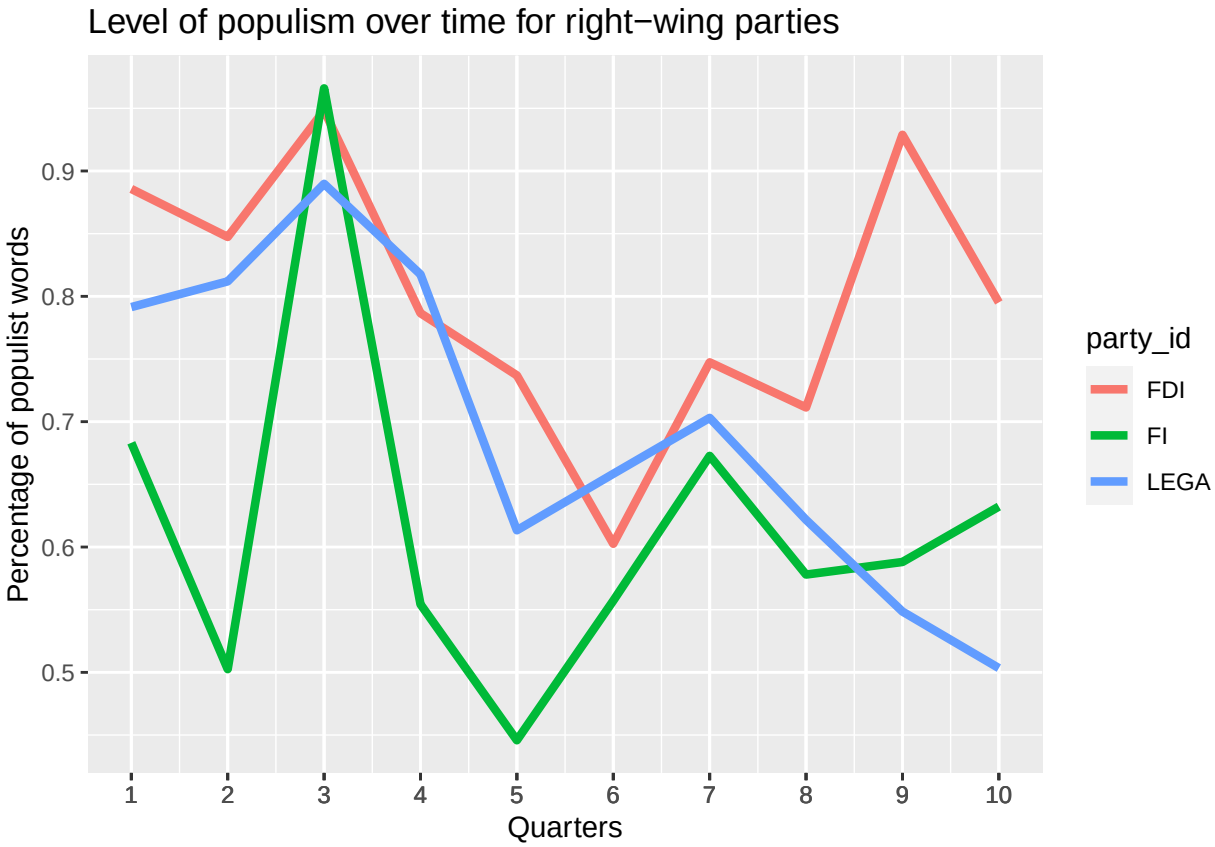
```
##
## Call:
## lm(formula = populism ~ factor_quarter + factor_party, data = data_dict1)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.30617 -0.06571  0.00588  0.05535  0.32599
##
## Coefficients:
##                            Estimate Std. Error t value Pr(>|t|)
## (Intercept)                 0.60934    0.05058  12.046  < 2e-16 ***
## factor_quarter1             0.04082    0.05058   0.807 0.421838
## factor_quarter2            -0.09418    0.05058  -1.862 0.065878 .
## factor_quarter3             0.13606    0.05058   2.690 0.008522 **
## factor_quarter4            -0.04390    0.05058  -0.868 0.387769
## factor_quarter5            -0.10164    0.05058  -2.009 0.047500 *
## factor_quarter6            -0.07861    0.05058  -1.554 0.123684
## factor_quarter7             0.04596    0.05058   0.909 0.365971
## factor_quarter9             0.09022    0.05058   1.783 0.077879 .
## factor_quarter10           -0.04369    0.05058  -0.864 0.390079
## factor_partyCI             -0.10503    0.05305  -1.980 0.050793 .
## factor_partyFDI             0.19458    0.05305   3.668 0.000414 ***
## factor_partyFI              0.01356    0.05305   0.256 0.798859
## factor_partyINDIPENDENTE -0.14233    0.05305  -2.683 0.008687 **
## factor_partyIV             -0.12078    0.05305  -2.277 0.025184 *
## factor_partyLEGA            0.09147    0.05305   1.724 0.088134 .
## factor_partyLEU            -0.01339    0.05305  -0.252 0.801282
## factor_partyM5S             0.15814    0.05305   2.981 0.003698 **
## factor_partyMISTO           0.03265    0.05305   0.615 0.539799
## factor_partyREG_LEAGUES  -0.18644    0.05305  -3.514 0.000693 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.1186 on 90 degrees of freedom
## Multiple R-squared:  0.6326, Adjusted R-squared:  0.5551
## F-statistic: 8.157 on 19 and 90 DF,  p-value: 1.35e-12
```

Trends in the level of populism for each parliamentary group over time

```
#By party & time (quarters)
parties_time <- data_dict1 %>% select(populism, party_id, quarter)

right_party <- data_dict1 %>% select(populism, party_id, quarter) %>%
  filter(party_id == "FDI"|party_id =="FI"|party_id =="LEGA")
left_party <- data_dict1 %>% select(populism, party_id, quarter) %>%
  filter(party_id == "LEU"|party_id =="M5S"|party_id =="PD"|party_id =="IV")

# Left parties in time
ggplot(left_party, aes(x=quarter, y=populism, color=party_id)) +
  geom_line(size=1.5)+
  scale_x_continuous("Quarters", labels = as.character(left_party$quarter),
                     breaks = left_party$quarter)+
  ylab("Percentage of populist words")+
  ggtitle("Level of populism over time for left-wing parties")
```




```
# Right parties in time
ggplot(right_party, aes(x=quarter, y=populism, color=party_id)) +
  geom_line(size=1.5)+
  scale_x_continuous("Quarters", labels = as.character(right_party$quarter),
                     breaks = right_party$quarter)+
  ylab("Percentage of populist words")+
  ggtitle("Level of populism over time for right-wing parties")
```


Level of populism over time for right−wing parties
Percentage of populist words
0.9
0.8
0.7
0.6
0.5
1
2
3
4
5
6
7
8
9
10
Quarters
party_id
FDI
FI
LEGA

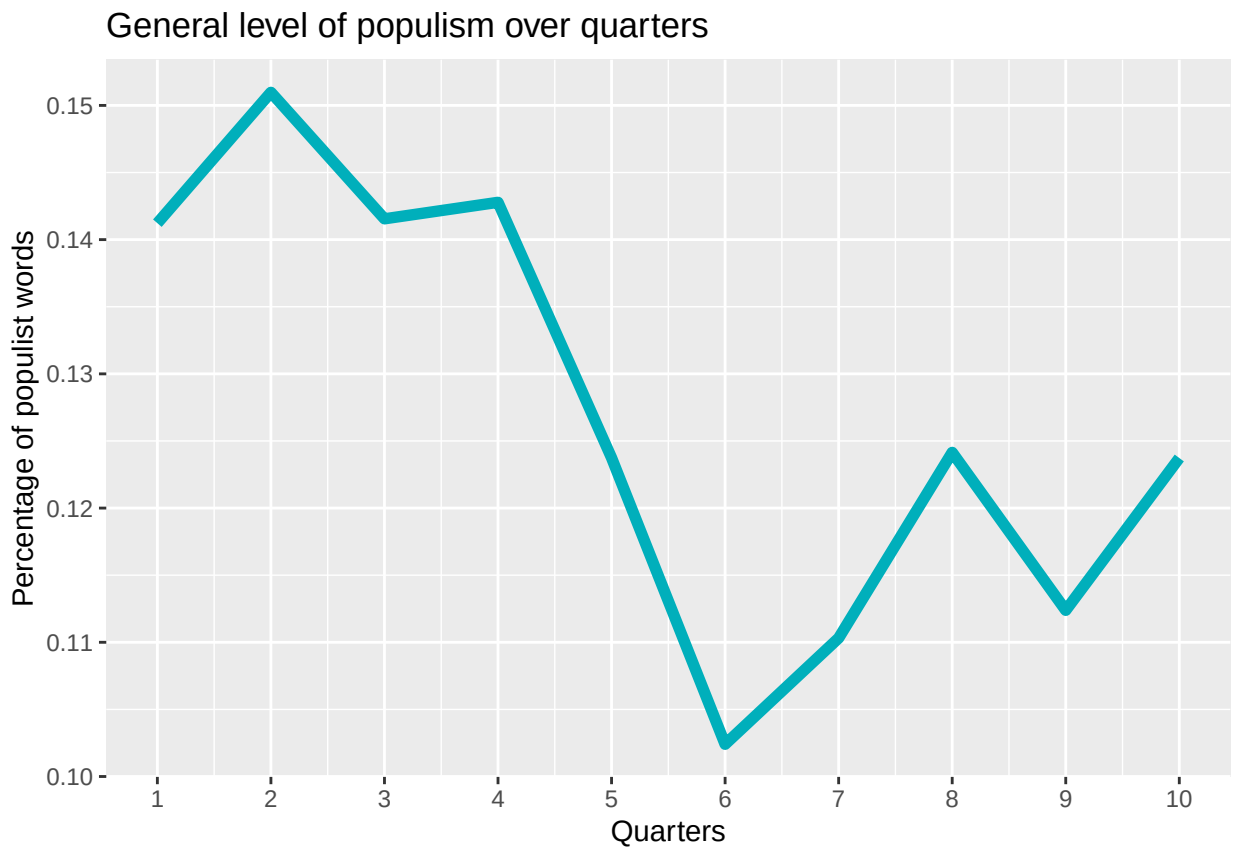
Rooduijn_Pauwels_Italian

```
# Dictionary analysis with Rooduijn_Pauwels_Italian
# By quarter
dfm_dict2  <- dfm_lookup(dfm_weigh_p_quart,
                         dictionary = Rooduijn_Pauwels_Italian)
```

```
data_dict2 <- dfm_dict2 %>%
  quanteda::convert(to = "data.frame") %>%
  cbind(docvars(dfm_dict2))
```

Level of populism over time

```
#Over time general level populism (quarters)
data_quarter_general2 <- aggregate(x = data_dict2$populism,  # Specify data column
          by = list(data_dict2$quarter),  # Specify group indicator
          FUN = mean) # Specify function (i.e. mean)
data_quarter_general2$perc <- data_quarter_general2$x * 100

# plot the level of populism
plot_general2 <- ggplot(data = data_quarter_general2, aes(x = Group.1, y = perc))+
  geom_line(color = "#00AFBB", size = 2)+
  scale_x_continuous("Quarters", labels = as.character(data_quarter_general2$Group.1), breaks = data_qua
  ylab("Percentage of populist words")+
  labs(title = "General level of populism over quarters")
plot_general2
```

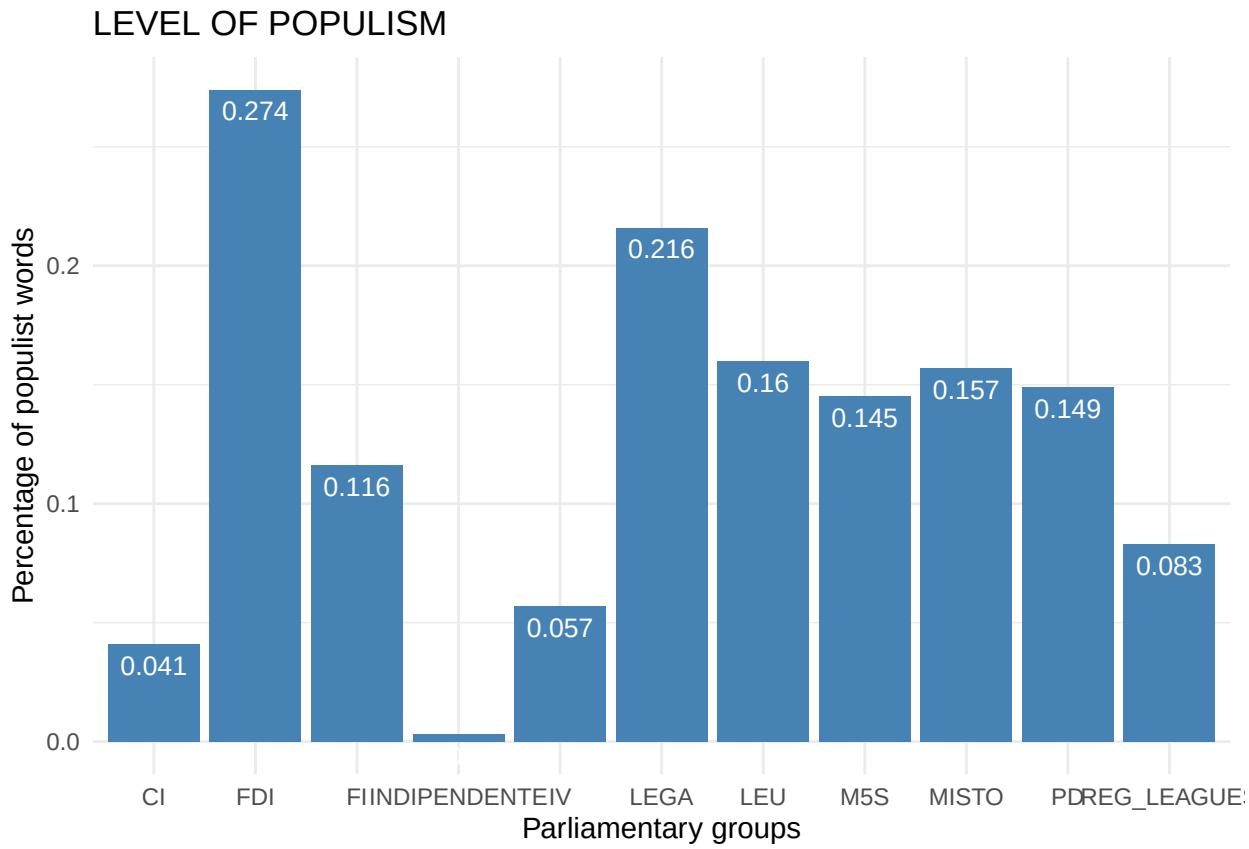


Ranking of parliamentary groups according their populism level

```
# POPULISM
data_party2 <- aggregate(x = data_dict2$populism,  # Specify data column
          by = list(data_dict2$party_id),  # Specify group indicator
          FUN = mean) # Specify function (i.e. mean)
data_party2$perc <- round(data_party2$x * 100 ,3)
kable(data_party2 %>% select(Group.1, perc) %>%  arrange(desc(perc)))
```

Group.1	perc
FDI	0.274
LEGA	0.216
LEU	0.160
MISTO	0.157
PD	0.149
M5S	0.145
FI	0.116
REG_LEAGUES	0.083
IV	0.057
CI	0.041
INDIPENDENTE	0.003

```
ggplot(data=data_party2, aes(x=Group.1, y=perc)) +
  geom_bar(stat="identity", fill="steelblue")+
  geom_text(aes(label=perc), vjust=1.6, color="white", size=3.5)+
  theme_minimal()+
  ylab("Percentage of populist words")+
  xlab("Parliamentary groups")+
  labs(title = "LEVEL OF POPULISM")
```



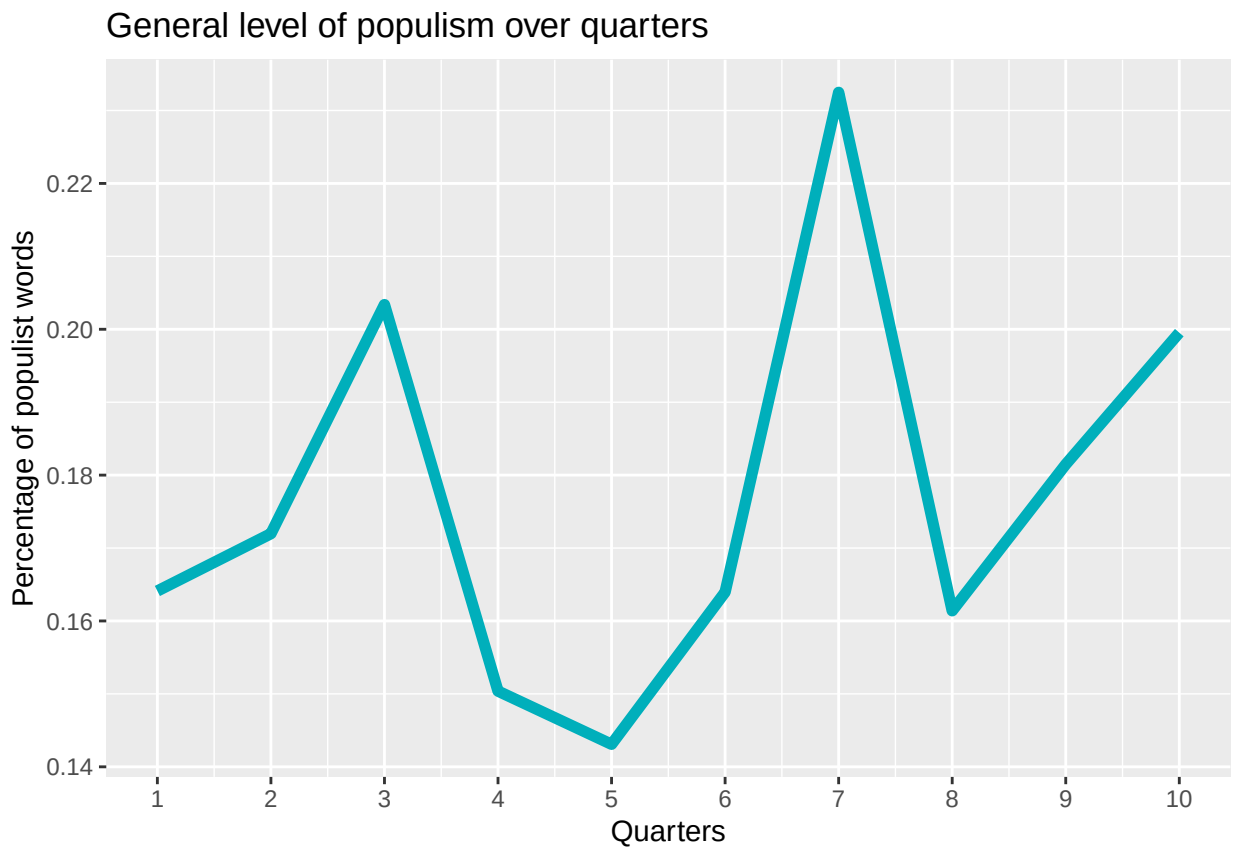
Grundl_Italian_adapted

```
# Dictionary analysis with Rooduijn_Pauwels_Italian
# By quarter
dfm_dict3  <- dfm_lookup(dfm_weigh_p_quart,
                         dictionary = Grundl_Italian_adapted)
```

```
data_dict3 <- dfm_dict3 %>%
  quanteda::convert(to = "data.frame") %>%
  cbind(docvars(dfm_dict3))
```

Level of populism in time

```
#Over time general level populism (quarters)
data_quarter_general3 <- aggregate(x = data_dict3$populism,  # Specify data column
          by = list(data_dict3$quarter),  # Specify group indicator
          FUN = mean) # Specify function (i.e. mean)
data_quarter_general3$perc <- data_quarter_general3$x * 100

# plot the level of populism
plot_general3 <- ggplot(data = data_quarter_general3, aes(x = Group.1, y = perc))+
  geom_line(color = "#00AFBB", size = 2)+
  scale_x_continuous("Quarters", labels = as.character(data_quarter_general3$Group.1), breaks = data_qua
  ylab("Percentage of populist words")+
  labs(title = "General level of populism over quarters")
plot_general3
```

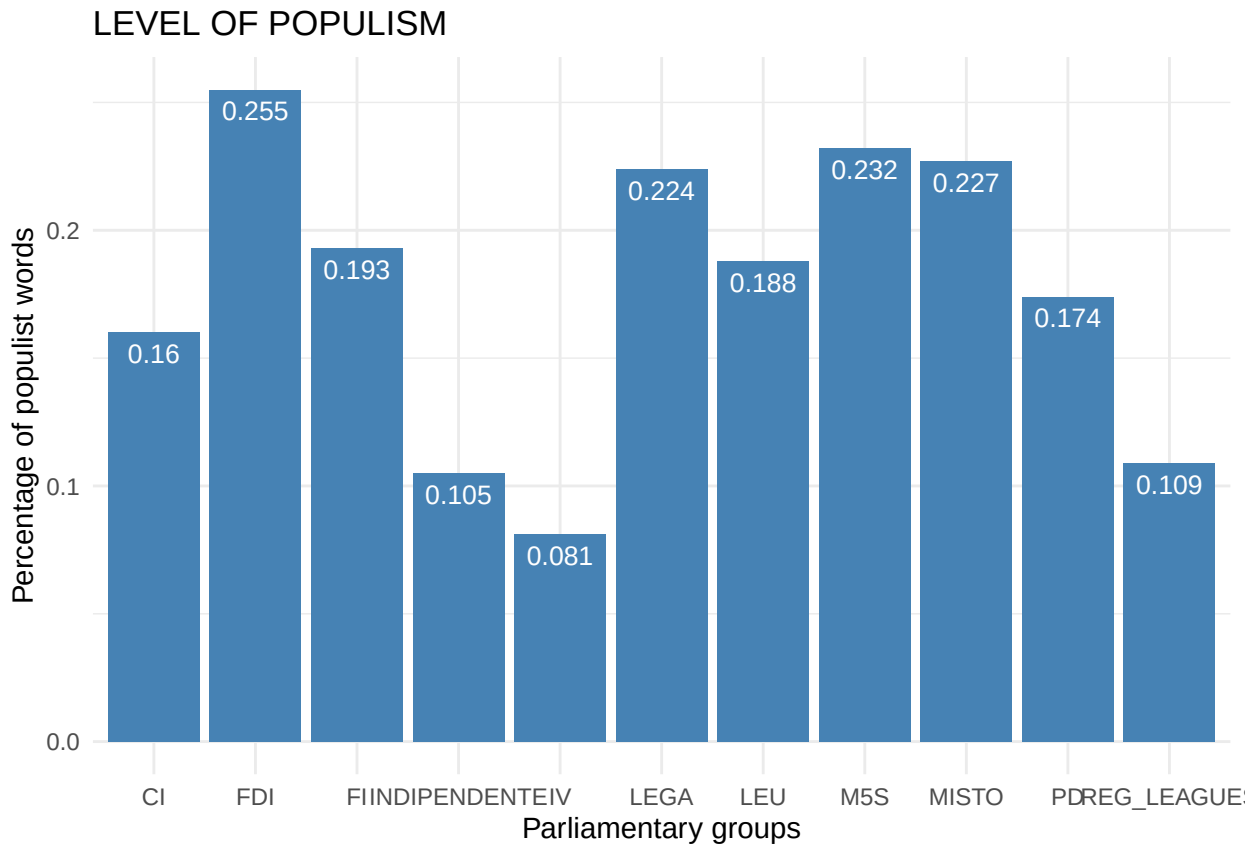


Most populist parliamentary group

```
# POPULISM
data_party3 <- aggregate(x = data_dict3$populism,  # Specify data column
          by = list(data_dict3$party_id),  # Specify group indicator
          FUN = mean) # Specify function (i.e. mean)
data_party3$perc <- round(data_party3$x * 100 ,3)
kable(data_party3 %>% select(Group.1, perc) %>%  arrange(desc(perc)))
```

Group.1	perc
FDI	0.255
M5S	0.232
MISTO	0.227
LEGA	0.224
FI	0.193
LEU	0.188
PD	0.174
CI	0.160
REG_LEAGUES	0.109
INDIPENDENTE	0.105
IV	0.081

```
ggplot(data=data_party3, aes(x=Group.1, y=perc)) +
  geom_bar(stat="identity", fill="steelblue")+
  geom_text(aes(label=perc), vjust=1.6, color="white", size=3.5)+
  theme_minimal()+
  ylab("Percentage of populist words")+
  xlab("Parliamentary groups")+
  labs(title = "LEVEL OF POPULISM")
```



Compare the general level of populism over time for the dictionaries