

# NGOs and government

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```
# load packages
require(knitr)
require(foreign)
require(car)
require(stargazer)
library(sandwich)
library(lmtest)
library(AER)
library(gmodels)
require(lattice)
library(dplyr)
library(gdata)
library(MASS)
library(mlogit)
library(gridExtra)

x <- c("ggplot2", "ggmap", "mapdata", "maps", "rworldmap", "rgdal",
      "rgeos", "maptools", "tidyr")
lapply(x, library, character.only = TRUE)
```

```
# read the spss data set and set seed
set.seed(223)
setwd("/Users/qiangguo/Dropbox/with Changdong")
data<-read.spss("S01.sav", to.data.frame=TRUE)
z <- c(39, 96, 138:140, 306, 353:359, 361:365, 369, 458, 485, 486, 501:503, 527:528,
      541:545, 593:600, 643, 650, 660:666, 693:697, 699:706, 815:816, 820:823,
      834:837)
data <- data[-z,]
```

```
#####
## summary statistics function ##
#####

summary.stats <- function(x){
  obs <- length(na.omit(x))
  mean <- mean(na.omit(x))
  sd <- sqrt(sum((mean - na.omit(x))^2)/length(na.omit(x)))
  min <- min(na.omit(x))
  max <- max(na.omit(x))
  as.data.frame(cbind(obs, mean, sd, min, max))
}
```

```
# category of the NGOs defined by functions
# the categorization of NGOs seems to be arbitrary, and thus "category" variable can not be included
# in the empirical analysis
```

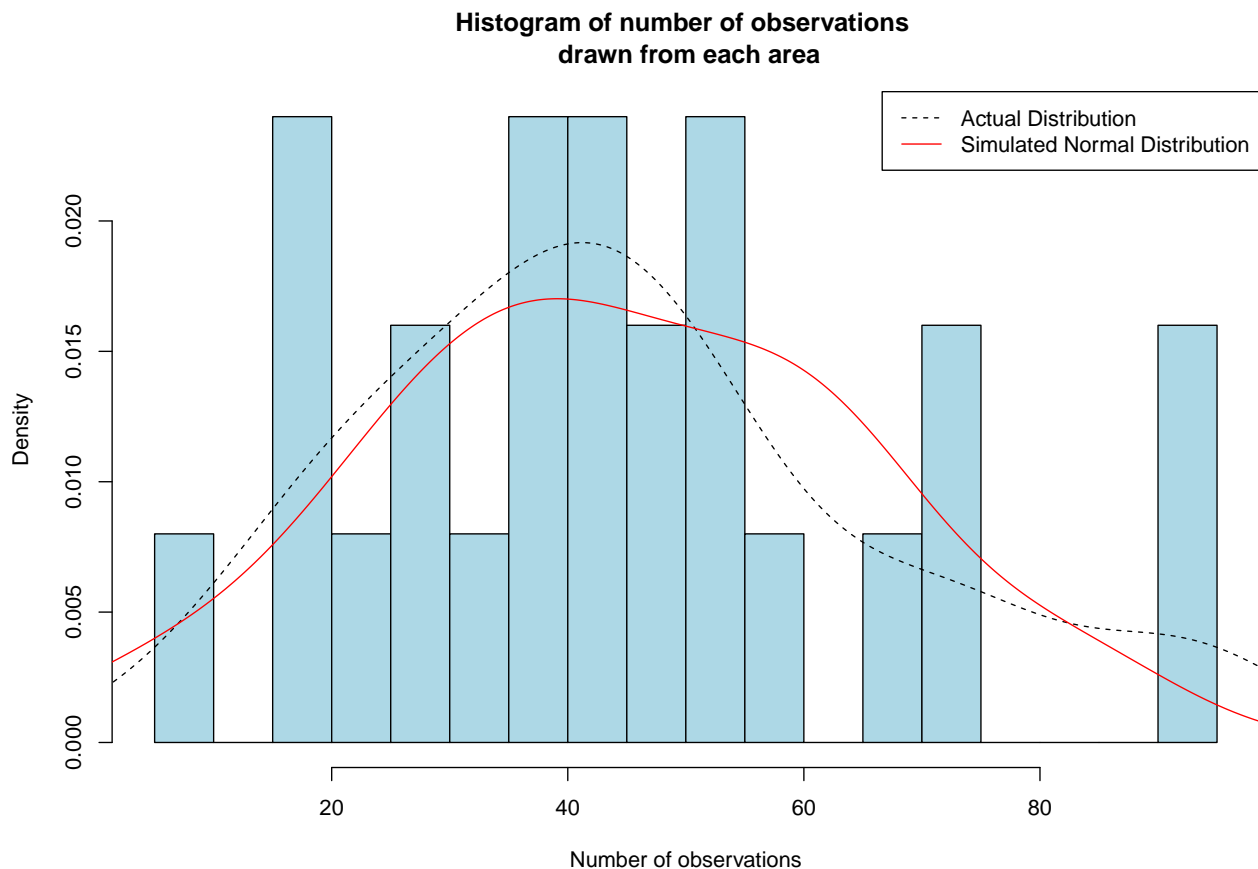
```

data$category <- data$sa7a
data$category <- as.numeric(data$sa7a)

# barplot(height = category[,2], width = 0.4, xlim = c(0, 2), space = 0.3,
#         col = c(1, "yellow", "hotpink", "lightblue"), axes = TRUE,
#         legend.text = c("academic", "industrial", "professional", "solidarity"),
#         xlab = "Category", ylab = "Number of NGOs in each category",
#         main = "Distribution of category of NGOs")

# the plot below shows that the sampling is a randomization as the distribution of areas from which sam
# were drawn is approximately normal
area_freq <- as.data.frame(table(as.factor(data$area)))
hist(area_freq[,2], prob = TRUE, col = "lightblue", breaks = 25,
     main = "Histogram of number of observations \n drawn from each area",
     xlab = "Number of observations")
lines(density(area_freq[,2]), lty = 2)
lines(density(rnorm(25, mean = mean(area_freq[,2]), sd = sd(area_freq[,2]))), col = "red")
legend("topright", legend = c("Actual Distribution", "Simulated Normal Distribution"),
     col = c("black", "red"), lty = c(2, 1))

```



```

# list the variable names needed for this research
y <- c("category", "area", "Population", "government_policy_change", "government_consultation",
      "funding_government_ratio", "funding_donation_ratio", "funding_member_ratio",
      "funding_service_ratio", "funding_other_ratio", "media_effects",
      "meeting_times", "meeting_effects", "funding_government", "funding_member", "funding_donation",

```

```
"funding_service","funding_other", "report", "report_effects", "phonenletter",
"phonenletter_effects", "member_phonenletter", "member_phonenletter_effects",
"personal_suggestion","personal_suggestion_effects", "media",
"ally", "ally_effects", "legal", "legal_effects", "petition", "petition_effects",
"convene_meeting", "convene_meeting_effects", "PGDP", "ind_member", "group_member",
"purpose_policy", "revenue_from_supervisory", "budget")
```

```
#####
### through which channel the NGOs effectively change government policies ###
#####
```

```
# meetings times with local government in 2009
data$meeting_times <- data$T_C3A
# assign 0 to observations with NAs, we take no response as no meeting
# with local government, same for other channels
data$meeting_times[is.na(data$meeting_times)] <- 0
summary.stats(data$meeting_times)
```

```
##      obs      mean      sd min max
## 1 1123 1.105076 2.424203   0  32
```

```
# self-reported effects of the meeting (for all self-reported effects
# of measures from T_C3B to T_C3T, 3 means a huge effect, 2 moderate, 1 no)
data$meeting_effects <- data$T_C3B
data$meeting_effects <- as.numeric(data$meeting_effects)

# assign 1 (no effect) to observations that report
# no meeting with local government
data$meeting_effects[data$meeting_times == 0] <- 1
table(data$meeting_effects)
```

```
##
##      1      2      3
## 708 148 241
```

```
# self-reported times of report submission to local government
data$report <- data$T_C3C
data$report[is.na(data$report)] <- 0
summary.stats(data$report)
```

```
##      obs      mean      sd min max
## 1 1123 0.8628673 5.053135   0 150
```

```
# self-reported effects of report submission to local government
data$report_effects <- data$T_C3D
data$report_effects <- as.numeric(data$report_effects)

# assign 1 (no effect) to observations that report no submission to local government
data$report_effects[data$report == 0] <- 1
```

```
# self-reported times of telephone or letters
data$phonenletter <- data$T_C3E
data$phonenletter[is.na(data$phonenletter)] <- 0
summary.stats(data$phonenletter)
```

```
##      obs      mean      sd min  max
## 1 1123 9.79163 265.3086   0 8888
```

```
# self-reported effects of telephone or letters
data$phonenletter_effects <- data$T_C3F
data$phonenletter_effects <- as.numeric(data$phonenletter_effects)
```

```
# assign 1 (no effect) to observations that report
# no telephone or letters to local government
data$phonenletter_effects[data$phonenletter == 0] <- 1
```

```
# self-reported times of persuading members to call or write letters to local government
data$member_phonenletter <- data$T_C3G
data$member_phonenletter[is.na(data$member_phonenletter)] <- 0
summary.stats(data$member_phonenletter)
```

```
##      obs      mean      sd min  max
## 1 1123 0.1878896 3.089544   0 100
```

```
# self-reported effects of persuading members to call or write letters to local government
data$member_phonenletter_effects <- data$T_C3H
data$member_phonenletter_effects <- as.numeric(data$member_phonenletter_effects)
```

```
# assign 1 (no effect) to observations that report no persuasion
data$member_phonenletter_effects[data$member_phonenletter == 0] <- 1
```

```
# self-reported times of using personal ties to make suggestions to local government
data$personal_suggestion <- data$T_C3I
data$personal_suggestion[is.na(data$personal_suggestion)] <- 0
summary.stats(data$personal_suggestion)
```

```
##      obs      mean      sd min  max
## 1 1123 0.3223508 3.788405   0 120
```

```
# self-reported effects of using personal ties to make suggestions to local government
data$personal_suggestion_effects <- data$T_C3J
data$personal_suggestion_effects <- as.numeric(data$personal_suggestion_effects)
```

```
# assign 1 to observations that report no suggestions using personal ties
data$personal_suggestion_effects[data$personal_suggestion == 0] <- 1
```

```
# self-reported times of expressing concerns through media
data$media <- data$T_C3K
data$media[is.na(data$media)] <- 0
summary.stats(data$media)
```

```
##      obs      mean      sd min max
## 1 1123 0.175423 1.317882  0  30
```

```
# self-reported effects of expressing concerns through media
data$media_effects <- data$T_C3L
data$media_effects <- as.numeric(data$media_effects)

# assign 1 to observations that report no concerns through media
data$media_effects[data$media == 0] <- 1

# self-reported times of allying with other associations
data$ally <- data$T_C3M
data$ally[is.na(data$ally)] <- 0
summary.stats(data$ally)
```

```
##      obs      mean      sd min max
## 1 1123 0.2315227 1.105239  0  15
```

```
# self-reported effects of allying with other associations
data$ally_effects <- data$T_C3N
data$ally_effects <- as.numeric(data$ally_effects)

# assign 1 to observations that report no ally
data$ally_effects[data$ally == 0] <- 1

# self-reported dealing with government through legal procedures
data$legal <- data$T_C3O
data$legal[is.na(data$legal)] <- 0
summary.stats(data$legal)
```

```
##      obs      mean      sd min max
## 1 1123 0.0445236 0.5336194  0  15
```

```
# self-reported effects of dealing with government through legal procedures
data$legal_effects <- data$T_C3P
data$legal_effects <- as.numeric(data$legal_effects)

# assign 1 to observations that report did not go launch legal procedures
data$legal_effects[data$legal == 0] <- 1

# self-reported times of petition
data$petition <- data$T_C3Q
data$petition[is.na(data$petition)] <- 0
summary.stats(data$petition)
```

```
##      obs      mean      sd min max
## 1 1123 0.00890472 0.09394374  0  1
```

```
# self-reported effects of petition
data$petition_effects <- data$T_C3R
data$petition_effects <- as.numeric(data$petition_effects)
```

```
# assign 1 to observations that report no petition
data$petition_effects[data$petition == 0] <- 1
```

```
# self-reported times of convening a massive meeting
data$convene_meeting <- data$T_C3S
data$convene_meeting[is.na(data$convene_meeting)] <- 0
summary.stats(data$convene_meeting)
```

```
##      obs      mean      sd min max
## 1 1123 0.02048085 0.2243601   0   5
```

```
# self-reported effects of convening a massive meeting
data$convene_meeting_effects <- data$T_C3T
data$convene_meeting_effects <- as.numeric(data$convene_meeting_effects)
```

```
# assign 1 to observations that report no meeting convention
data$convene_meeting_effects[data$convene_meeting == 0] <- 1
```

```
#####
# interactions with government in general #
#####
```

```
# whether government consults the NGOs, 1 yes, 2 no after converting to numerics
data$government_consultation <- data$T_C8
data$government_consultation <- as.numeric(data$government_consultation)
data$government_consultation[is.na(data$government_consultation)] <- 2
# recode the variable, 1 as yes, 0 as no
data$government_consultation <- data$government_consultation - 1
data$government_consultation <- recode(data$government_consultation, "1 = 0; else = 1")
table(data$government_consultation)
```

```
##
##      0      1
## 733 390
```

```
summary.stats(data$government_consultation)
```

```
##      obs      mean      sd min max
## 1 1123 0.3472841 0.476107   0   1
```

```
# delete the missings from the consultation variable
data$government_consultation_origin <- data$T_C8
data$government_consultation_origin <- as.numeric(data$government_consultation)
```

```
# self-reported government policy influence, 1 yes, 2 no after converting to numerics
data$government_policy_change <- data$T_C9
data$government_policy_change <- as.numeric(data$government_policy_change)
data$government_policy_change[is.na(data$government_policy_change)] <- 2
# recode the variable, 1 as yes, 0 as no
data$government_policy_change <- data$government_policy_change - 1
data$government_policy_change <- recode(data$government_policy_change, "1 = 0; else = 1")
table(data$government_policy_change)
```

```
##
##      0      1
## 1020  103
```

```
summary.stats(data$government_policy_change)
```

```
##      obs      mean      sd min max
## 1 1123 0.09171861 0.2886283   0   1
```

```
# delete the missings from the policy change variable
```

```
data$government_policy_change_origin <- data$T_C9
```

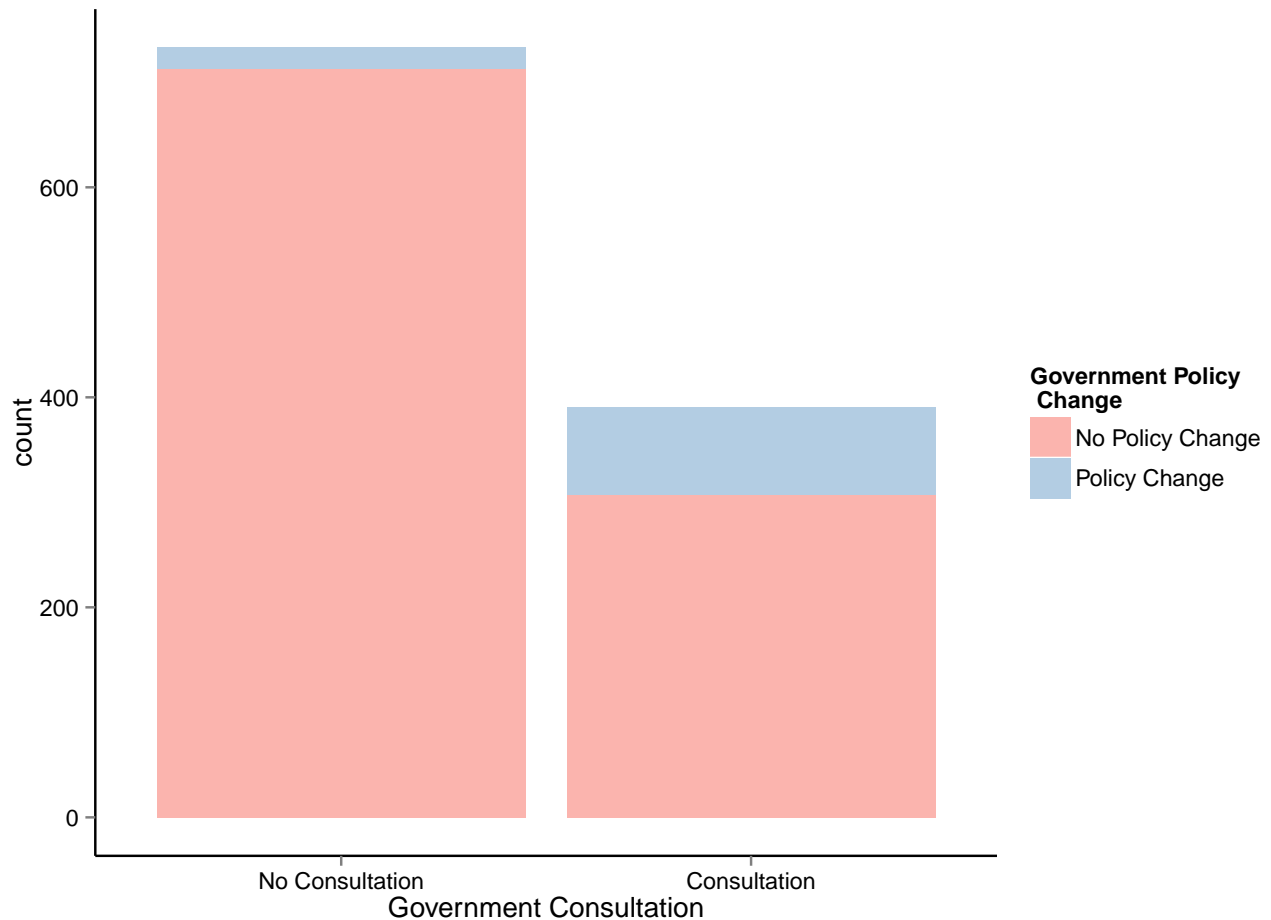
```
data$government_policy_change_origin <- as.numeric(data$government_policy_change_origin)
```

```
data$government_policy_change_origin[data$government_policy_change_origin == 2] <- 0
```

```
# plot the cross-table of consultation with government and policy influence
```

```
# pdf("ngo_policy_consultation.pdf", width = 8, height = 6)
```

```
ggplot(data, aes(as.factor(government_consultation), fill=as.factor(government_policy_change))) +
  geom_bar(binwidth = 0.05) + theme(panel.grid.major = element_blank(),
                                   panel.grid.minor = element_blank(),
                                   panel.background = element_blank(),
                                   axis.line = element_line(colour = "black"),
                                   plot.title = element_text(family="Times",
                                                             face = "bold",
                                                             colour="black"),
                                   axis.text.x=element_text(colour="black"),
                                   axis.text.y=element_text(colour="black")) +
  scale_x_discrete(name = "Government Consultation", breaks=c(0, 1),
                  labels=c("No Consultation", "Consultation")) +
  ggtitle("") +
  labs(fill = "Government Policy \n Change") +
  scale_fill_brewer(palette="Pastel1",
                  labels=c("No Policy Change", "Policy Change"))
```



```
# dev.off()
```

```
# ratio of funding from different sources
# data$revenue <- data$T_D2
# data$revenue_from_government_ratio <- data$T_D2A
# data$revenue_from_donation_ratio <- data$T_D2C
# data$revenue_from_service_ratio <- data$T_D2D
# data$revenue_other_source_ratio <- data$T_D2E

# budget
data$budget <- data$T_D4
# to make the measure consistent in scale, divide observations with values >= 10,000 by 10,000
data$budget[which(data$budget >= 10000)] <- data$budget[which(data$budget >= 10000)]/10000

# funding from government
data$funding_government <- data$sd2a
data$funding_government <- as.double(as.character(data$funding_government))
```

```
## Warning: NAs introduced by coercion
```

```
data$funding_government[319] <- 29
data$funding_government[302] <- 1.2
```



```
# to make the measure consistent in scale, divide observations with values >= 3,000 by 10,000
data$funding_government[which(data$funding_government >= 3000)] <- data$funding_government[which(data$f
```

```
# funding from membership fees
data$funding_member <- data$sd2c
data$funding_member <- as.double(as.character(data$funding_member))
```

```
## Warning: NAs introduced by coercion
```

```
data$funding_member[303] <- 52.1
data$funding_member[319] <- 13.5
data$funding_member[345] <- 32
data$funding_member[351] <- 2.0366
data$funding_member[374] <- 100
# to make the measure consistent in scale, divide observations with values >= 1,000 by 10,000
data$funding_member[which(data$funding_member >= 1000)] <- data$funding_member[which(data$funding_member
```

```
# funding from donation
data$funding_donation <- data$sd2e
data$funding_donation <- as.double(as.character(data$funding_donation))
```

```
## Warning: NAs introduced by coercion
```

```
data$funding_donation[319] <- 3
data$funding_donation[374] <- 30
data$funding_donation[data$funding_donation == 684] <- 0.0684
# to make the measure consistent in scale, divide observations with values >= 1,000 by 10,000
data$funding_donation[which(data$funding_donation >= 1000)] <- data$funding_member[which(data$funding_d
```

```
# funding from social services
data$funding_service <- data$sd2g
data$funding_service <- as.double(as.character(data$funding_service))
```

```
## Warning: NAs introduced by coercion
```

```
data$funding_service[163] <- 0.25
data$funding_service[319] <- 4.5
data$funding_service[which(data$funding_service == 1500)] <- 0.15
# to make the measure consistent in scale, divide observations with values >= 4,000 by 10,000
data$funding_service[which(data$funding_service >= 4000)] <- data$funding_service[which(data$funding_se
```

```
# other funding source
data$funding_other <- data$sd2i
data$funding_other <- as.double(as.character(data$funding_other))
```

```
## Warning: NAs introduced by coercion
```

```
data$funding_other[221] <- 34
data$funding_other[303] <- 120
data$funding_other[319] <- 1.5
```

```

data$funding_other[which(data$funding_other == 999)] <- NA
# to make the measure consistent in scale, divide observations with values >= 1,000 by 10,000
data$funding_other[which(data$funding_other >= 1000)] <- data$funding_other[which(data$funding_other >=

# total income, funding or service revenue received
data$funding_total <- data$funding_government + data$funding_member + data$funding_service +
  data$funding_donation + data$funding_other

data$funding_government_ratio <- data$funding_government/data$funding_total
data$funding_member_ratio <- data$funding_member/data$funding_total
data$funding_service_ratio <- data$funding_service/data$funding_total
data$funding_donation_ratio <- data$funding_donation/data$funding_total
data$funding_other_ratio <- data$funding_other/data$funding_total

summary.stats(data$funding_government_ratio)

##      obs      mean      sd min max
## 1 419 0.2399889 0.3893356   0   1

data$binary_funding_government <- recode(data$funding_government, "0 = 0; NA = NA; else = 1")
summary.stats(data$binary_funding_government)

##      obs      mean      sd min max
## 1 729 0.3360768 0.4723655   0   1

summary.stats(data$fundingsource_count)

## Warning in is.na(object): is.na() applied to non-(list or vector) of type
## 'NULL'

## Warning in is.na(object): is.na() applied to non-(list or vector) of type
## 'NULL'

## Warning in mean.default(na.omit(x)): argument is not numeric or logical:
## returning NA

## Warning in is.na(object): is.na() applied to non-(list or vector) of type
## 'NULL'

## Warning in is.na(object): is.na() applied to non-(list or vector) of type
## 'NULL'

## Warning in is.na(object): is.na() applied to non-(list or vector) of type
## 'NULL'

## Warning in min(na.omit(x)): no non-missing arguments to min; returning Inf

## Warning in is.na(object): is.na() applied to non-(list or vector) of type
## 'NULL'

```

```
## Warning in max(na.omit(x)): no non-missing arguments to max; returning -Inf
```

```
##   obs mean  sd min  max
## 1    0   NA NaN Inf -Inf
```

```
funding <- cbind(data$funding_government, data$funding_member, data$funding_service, data$funding_donat.
```

```
x1 <- numeric(length = nrow(funding))
x2 <- numeric(length = nrow(funding))
x3 <- numeric(length = nrow(funding))
x4 <- numeric(length = nrow(funding))
x5 <- numeric(length = nrow(funding))
```

```
x1[which(data$funding_government > 0)] <- 1
x2[which(data$funding_member > 0)] <- 1
x3[which(data$funding_service > 0)] <- 1
x4[which(data$funding_donation > 0)] <- 1
x5[which(data$funding_other > 0)] <- 1
```

```
# count the funding sources
```

```
data$fundingsource_count <- x1 + x2 + x3 + x4 + x5
```

```
pdf("ngo_funding.pdf", width = 10, height = 6)
```

```
par(mfrow = c(1, 2))
```

```
# plot of the density of ratios of funding received by ngos
```

```
plot(density(na.omit(data$funding_government_ratio)), ylim = c(0, 8), xlab = "Funding Ratios (a)",
     main = "")
```

```
lines(density(na.omit(data$funding_member_ratio)), lty = 2)
```

```
lines(density(na.omit(data$funding_service_ratio)), lty = 3)
```

```
lines(density(na.omit(data$funding_donation_ratio)), lty = 4)
```

```
lines(density(na.omit(data$funding_other_ratio)), lty = 5)
```

```
legend("topright", c("Ratio of government funding", "Ratio of membership fees", "Ratio of service levies", "Ratio of other funding"),
      lty = 1:5, cex = 0.7)
```

```
# distribution of NGOs' funding sources
```

```
hist(data$fundingsource_count, breaks = 25, xlab = "Number of funding sources (b)", main = "")
dev.off()
```

```
## pdf
```

```
## 2
```

```
# number of individual members in an organization
```

```
data$ind_member <- data$sa4a
```

```
# number of group members in an organization
```

```
data$group_member <- data$sa4b
```

```
# revenue from supervisory authority
```

```
data$T_B3C <- as.numeric(data$T_B3C)
```

```
data$T_B3C[data$T_B3C == 2] <- 0
```

```
data$revenue_from_supervisory <- data$T_B3C
```

```
# purpose of establishing the NGO
```

```
data$purpose_policy <- as.numeric(data$sa6e)
```

```
data$purpose_policy[data$purpose_policy == 2] <- 0
summary.stats(data$purpose_policy)
```

```
##      obs      mean      sd min max
## 1 1110 0.1585586 0.3652639   0   1
```

```
purpose_policy_data <- as.data.frame(na.omit(data$purpose_policy))
names(purpose_policy_data) <- "Policy_Purpose"
```

```
# select all the relevant variables into a new dataset
clean_data <- subset(data, select = y)
```

```
clean_data$binary_funding_government <- data$binary_funding_government
clean_data$fundingsource_count <- data$fundingsource_count
```

```
# administrative level of the NGO
clean_data$adm_level <- as.numeric(data$Adm_area)
summary(data$Adm_area)
```

```
##      /
##      194      541      NA's
##      387      1
```

```
summary.stats(clean_data$adm_level)
```

```
##      obs      mean      sd min max
## 1 1122 2.172014 0.6987392   1   3
```

```
# create a budget (logged) variable, assign -1 to observations with budget value < 1
clean_data$budget <- data$budget
summary.stats(clean_data$budget)
```

```
##      obs      mean      sd min max
## 1 935 51.65919 451.3445   0 8450
```

```
log_budget <- log(data$budget)
log_budget[data$budget < 1] <- -1
clean_data$log_budget <- log_budget
clean_data$appointee <- as.numeric(data$T_B3D)
clean_data$appointee[clean_data$appointee == 2] <- 0
summary.stats(clean_data$appointee)
```

```
##      obs      mean      sd min max
## 1 1080 0.3472222 0.4760871   0   1
```

```
# adm_level of the head of an NGO
clean_data$head_adm_level <- as.numeric(data$T_A16F)
summary.stats(clean_data$head_adm_level)
```

```
##      obs      mean      sd min max
## 1 910 1.821978 0.8059943   1   4
```

```
# past employment record of the head of an NGO
clean_data$past_employment <- as.numeric(data$T_A16E)
summary.stats(clean_data$past_employment)
```

```
##      obs      mean      sd min max
## 1 1054 2.185009 1.294025   1    5
```

```
par(mfrow = c(2, 2))
hist(clean_data$head_adm_level, xaxt = 'n', main = "", xlab = "Administrative rank of NGO leaders (a)")
axis(1, at = c(1, 2, 3, 4), labels = c("rank 9 to 13", "rank 8 to 11 ", "rank 5 to 7", "rank 3 to 4"))

hist(clean_data$adm_level, xaxt = 'n', main = "",
      xlab = "Administrative level of NGOs' registration (b)" )
axis(1, at = c(1, 2, 3), labels = c("provincial level", "prefecture/district level", "county level"))

hist(clean_data$past_employment, breaks = 25, main = "", xaxt = 'n', xlab = "Categories of past employment")
frequency <- as.vector(table(clean_data$past_employment)) + 30
text(c(1.5, 2, 3.5, 4, 4.8), frequency, labels = c("government", "enterprise", "institutional organization"))
```

```
# spontaneous organization
clean_data$T_A5 <- data$T_A5
clean_data$spontaneous <- data$T_A5
clean_data$spontaneous <- as.numeric(clean_data$spontaneous)
summary.stats(clean_data$spontaneous)
```

```
##      obs      mean      sd min max
## 1 1089 2.089073 0.8377897   1    3
```

```
table(clean_data$spontaneous)
```

```
##
##    1    2    3
## 338 316 435
```

```
data$spontaneous <- clean_data$spontaneous
spontaneous_data <- na.omit(clean_data$spontaneous)
spontaneous_data <- as.data.frame(spontaneous_data)
names(spontaneous_data)[1] <- "spontaneous"
```

```
# plot of distribution of NGOs with different purposes of formation
#pdf("ngo_plot1.pdf", height = 6, width = 12)
plot_purpose <- ggplot(purpose_policy_data, aes(as.factor(Policy_Purpose), fill=as.factor(Policy_Purpose)))
  geom_bar(binwidth = 0.05) + theme(panel.grid.major = element_blank(),
  panel.grid.minor = element_blank(),
  panel.background = element_blank(),
  axis.line = element_line(colour = "black"),
  plot.title = element_text(family="Times",
  face = "bold",
  colour="black"),
  legend.position = "none",
  axis.text.x=element_text(colour="black"),
```

```

axis.text.y=element_text(colour="black")) +
scale_x_discrete(name = "", breaks=c(0, 1),
                  labels=c("No Policy Purpose", "Seek Policy Influence")) +
ggtitle("Policy purpose when NGOs were founded")

# plot the distribution of NGOs with different founding origins
plot_origin <- ggplot(spontaneous_data, aes(as.factor(spontaneous), fill=as.factor(spontaneous)))+
  geom_bar(binwidth = 0.05) + theme(panel.grid.major = element_blank(),
                                   panel.grid.minor = element_blank(),
                                   panel.background = element_blank(),
                                   axis.line = element_line(colour = "black"),
                                   plot.title = element_text(family="Times",
                                                             face = "bold",
                                                             colour="black"),
                                   legend.position = "none",
                                   axis.text.x=element_text(colour="black"),
                                   axis.text.y=element_text(colour="black")) +
scale_x_discrete(name = "", breaks=c(1, 2, 3),
                  labels=c("Voluntary", "Government Decided", "Both")) +
ggtitle("Whether the founding of the NGO \n is voluntary or decided by government")

grid.arrange(plot_purpose, plot_origin, ncol=2)
#dev.off()

# establishment time
clean_data$time <- 2010 - data$T_A2
summary.stats(clean_data$time)

##      obs      mean      sd min max
## 1 1066 10.09099 9.475067   0  60

# number of full-time staff
clean_data$full_time_staff <- data$T_a11
summary.stats(clean_data$full_time_staff)

##      obs      mean      sd min max
## 1  955  3.372775 7.490538   0 106

# log full time staff
clean_data$log_full_time_staff <- log(clean_data$full_time_staff)
clean_data$log_full_time_staff[which(clean_data$log_full_time_staff == -Inf)] <- -1

# whether members voluntarily join the NGO
clean_data$voluntary <- as.numeric(data$sb4)

# wage_staff
clean_data$wage_staff <- data$T_D8
clean_data$wage_staff[which(clean_data$wage_staff <= 5)] <- clean_data$wage_staff[which(clean_data$wage_

# self-reported influence on government
data$government_influence <- as.numeric(data$T_C18)

```

```
data$government_influence[data$government_influence == 6] <- NA
clean_data$government_influence <- data$government_influence
```

```
# whether there is a communist party branch in the NGO
clean_data$party_org <- as.numeric(data$T_B8)
clean_data$party_org[clean_data$party_org == 2] <- 0
summary.stats(clean_data$party_org)
```

```
##      obs      mean      sd min max
## 1 937 0.1430096 0.3500826   0   1
```

```
# associate with how many other NGOs?
clean_data$close_ngos <- data$sb18
```

```
# percentage of funding from individual members
clean_data$ind_ratio <- data$sb5a
```

```
## log the number of individual members
data$log_ind_member <- log(data$ind_member)
clean_data$ind_member <- data$ind_member
summary.stats(data$ind_member)
```

```
##      obs      mean      sd min      max
## 1 826 2386.57 28548.91   0 792790
```

```
data$log_ind_member[data$log_ind_member == -Inf] <- -1
clean_data$log_ind_member <- data$log_ind_member
```

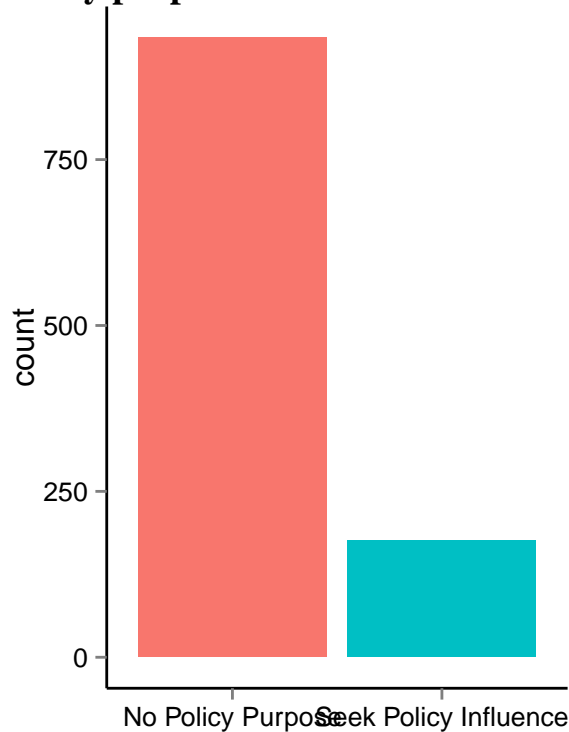
```
# self-reported influence on the community
data$community_influence <- as.numeric(data$T_C19)
data$community_influence[data$community_influence == 6] <- NA
clean_data$community_influence <- data$community_influence
```

```
# attach data$government_consultation_origin and data$government_policy_change_origin to clean_data
clean_data$government_consultation_origin <- data$government_consultation_origin
clean_data$government_policy_change_origin <- data$government_policy_change_origin
```

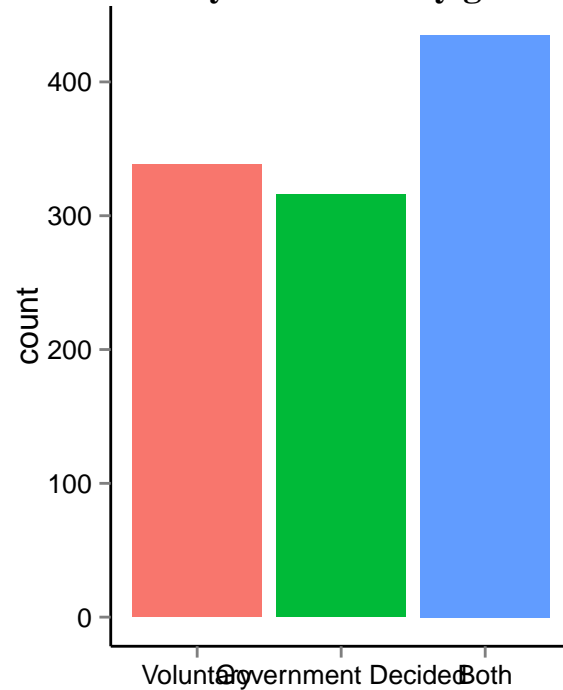
```
#####
## Recode frequency variables into binary variables ##
#####
```

```
clean_data$binary_meeting <- recode(clean_data$meeting_times, "0 = 0; else = 1")
clean_data$binary_report <- recode(clean_data$report, "0 = 0; else = 1")
clean_data$binary_phonenletter <- recode(clean_data$phonenletter, "0 = 0; else = 1")
clean_data$binary_member_phonenletter <- recode(clean_data$member_phonenletter, "0 = 0; else = 1")
clean_data$binary_personal_suggestion <- recode(clean_data$personal_suggestion, "0 = 0; else = 1")
clean_data$binary_media <- recode(clean_data$media, "0 = 0; else = 1")
clean_data$binary_ally <- recode(clean_data$ally, "0 = 0; else = 1")
clean_data$binary_legal <- recode(clean_data$legal, "0 = 0; else = 1")
clean_data$binary_petition <- recode(clean_data$petition, "0 = 0; else = 1")
clean_data$binary_convene_meeting <- recode(clean_data$convene_meeting, "0 = 0; else = 1")
```

**Policy purpose when NGOs were found**



**Whether the founding of the NGO is voluntary or decided by government**



```
#####
## statistical analysis ##
#####
```

```
## what kind of NGOs are more likely to be consulted by government?
```

```
## baseline
```

```
lm1 <- glm(government_consultation ~ as.factor(party_org) + as.factor(appointee) +
  binary_funding_government + fundingsource_count,
  data = clean_data, family = binomial("logit"))
```

```
lm2 <- glm(government_consultation ~ as.factor(party_org) + as.factor(appointee) +
  binary_funding_government + fundingsource_count +
  budget + as.factor(purpose_policy) + as.factor(spontaneous) +
  as.factor(adm_level) + ind_member + full_time_staff +
  as.factor(past_employment) +
  as.factor(head_adm_level) + time,
  data = clean_data, family = binomial("logit"))
```

```
stargazer(lm1, lm2)
```

```
##
```

```
## % Table created by stargazer v.5.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu
```

```
## % Date and time: Mon, Oct 19, 2015 - 14:03:24
```

```
## \begin{table}[!htbp] \centering
```

```
## \caption{}
```

```
## \label{}
```

```
## \begin{tabular}{@{\extracolsep{5pt}}lcc}
```

```
## \[-1.8ex\]\hline
```



```

## \hline \[-1.8ex]
## & \multicolumn{2}{c}{\textit{Dependent variable:}} \\\
## \cline{2-3}
## \[-1.8ex] & \multicolumn{2}{c}{government\_consultation} \\\
## \[-1.8ex] & (1) & (2) \\\
## \hline \[-1.8ex]
## as.factor(party\_org)1 & 1.109$^{***}$ & 1.208$^{***}$ \\\
## & (0.236) & (0.361) \\\
## & & \\\
## as.factor(appointee)1 & 0.585$^{***}$ & 0.696$^{**}$ \\\
## & (0.189) & (0.280) \\\
## & & \\\
## binary\_funding\_government & 0.577$^{***}$ & 0.535 \\\
## & (0.222) & (0.333) \\\
## & & \\\
## fundingsource\_count & 0.165 & $-$0.027 \\\
## & (0.101) & (0.154) \\\
## & & \\\
## budget & & 0.003 \\\
## & & (0.002) \\\
## & & \\\
## as.factor(purpose\_policy)1 & & 1.136$^{***}$ \\\
## & & (0.355) \\\
## & & \\\
## as.factor(spontaneous)2 & & 0.032 \\\
## & & (0.348) \\\
## & & \\\
## as.factor(spontaneous)3 & & 0.629$^{**}$ \\\
## & & (0.319) \\\
## & & \\\
## as.factor(adm\_level)2 & & $-$0.318 \\\
## & & (0.370) \\\
## & & \\\
## as.factor(adm\_level)3 & & 0.195 \\\
## & & (0.450) \\\
## & & \\\
## ind\_member & & $-$0.00003 \\\
## & & (0.00003) \\\
## & & \\\
## full\_time\_staff & & 0.022 \\\
## & & (0.017) \\\
## & & \\\
## as.factor(past\_employment)2 & & 0.613 \\\
## & & (0.392) \\\
## & & \\\
## as.factor(past\_employment)3 & & 0.165 \\\
## & & (0.342) \\\
## & & \\\
## as.factor(past\_employment)4 & & $-$0.944 \\\
## & & (1.265) \\\
## & & \\\
## as.factor(past\_employment)5 & & $-$0.028 \\\
## & & (0.504) \\\
## & & \\\
## & & \\\

```

```

## as.factor(head\_adm\_level)2 & & 0.237 \\
## & & (0.332) \\
## & & \\
## as.factor(head\_adm\_level)3 & & $-0.200 \\
## & & (0.473) \\
## & & \\
## as.factor(head\_adm\_level)4 & & 0.792 \\
## & & (1.005) \\
## & & \\
## time & & 0.017 \\
## & & (0.015) \\
## & & \\
## Constant & $-1.330$^{***}$ & $-2.000$^{***}$ \\
## & (0.162) & (0.567) \\
## & & \\
## \hline \\[-1.8ex]
## Observations & 584 & 347 \\
## Log Likelihood & $-357.239$ & $-192.541$ \\
## Akaike Inf. Crit. & 724.478 & 427.081 \\
## \hline
## \hline \\[-1.8ex]
## \textit{Note:} & \multicolumn{2}{r}{\textit{$^*$}p$<$0.1; \textit{$^{**}$}p$<$0.05; \textit{$^{***}$}p$<$0.01} \\
## \end{tabular}
## \end{table}

```

```

lm3 <- glm(government_consultation ~ as.factor(party_org) + as.factor(appointee) +
  funding_government_ratio,
  data = clean_data, family = binomial("logit"))

lm4 <- glm(government_consultation ~ as.factor(party_org) + as.factor(appointee) +
  funding_government_ratio + budget + as.factor(spontaneous) +
  as.factor(purpose_policy) + full_time_staff + ind_member + as.factor(adm_level) +
  as.factor(past_employment) + as.factor(head_adm_level) + time,
  data = clean_data, family = binomial("logit"))

stargazer(lm3, lm4)

```

```

##
## % Table created by stargazer v.5.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu
## % Date and time: Mon, Oct 19, 2015 - 14:03:25
## \begin{table}[!htbp] \centering
## \caption{}
## \label{}
## \begin{tabular}{@{\extracolsep{5pt}}lcc}
## \\[-1.8ex]\hline
## \hline \\[-1.8ex]
## & \multicolumn{2}{c}{\textit{Dependent variable:}} \\
## \cline{2-3}
## \\[-1.8ex] & \multicolumn{2}{c}{government\_consultation} \\
## \\[-1.8ex] & (1) & (2) \\
## \hline \\[-1.8ex]
## as.factor(party\_org)1 & 1.033$^{***}$ & 1.090$^{**}$

```

```

## & (0.286) & (0.456) \\
## & & \\
## as.factor(appointee)1 & 0.790$^{***}$ & 0.897$^{**}$ \\
## & (0.251) & (0.368) \\
## & & \\
## funding\_government\_ratio & 0.468 & 0.245 \\
## & (0.319) & (0.452) \\
## & & \\
## budget & & 0.002 \\
## & & (0.003) \\
## & & \\
## as.factor(spontaneous)2 & & 0.285 \\
## & & (0.457) \\
## & & \\
## as.factor(spontaneous)3 & & 0.714$^{*}$ \\
## & & (0.428) \\
## & & \\
## as.factor(purpose\_policy)1 & & 1.147$^{***}$ \\
## & & (0.435) \\
## & & \\
## full\_time\_staff & & 0.032 \\
## & & (0.021) \\
## & & \\
## ind\_member & & $-$0.0001 \\
## & & (0.0001) \\
## & & \\
## as.factor(adm\_level)2 & & $-$0.948$^{**}$ \\
## & & (0.484) \\
## & & \\
## as.factor(adm\_level)3 & & $-$0.192 \\
## & & (0.599) \\
## & & \\
## as.factor(past\_employment)2 & & 0.596 \\
## & & (0.495) \\
## & & \\
## as.factor(past\_employment)3 & & $-$0.218 \\
## & & (0.456) \\
## & & \\
## as.factor(past\_employment)4 & & $-$0.799 \\
## & & (1.405) \\
## & & \\
## as.factor(past\_employment)5 & & $-$0.376 \\
## & & (0.742) \\
## & & \\
## as.factor(head\_adm\_level)2 & & 0.046 \\
## & & (0.441) \\
## & & \\
## as.factor(head\_adm\_level)3 & & $-$0.081 \\
## & & (0.611) \\
## & & \\
## as.factor(head\_adm\_level)4 & & $-$0.250 \\
## & & (1.215) \\
## & & \\
## time & & 0.034 \\

```

```
##      &      & (0.022) \\
##      &      & \\
##      Constant & $-1.114$^{***}$ & $-1.647$^{**}$ \\
##      & (0.177) & (0.690) \\
##      &      & \\
## \hline \\[-1.8ex]
## Observations & 325 & 211 \\
## Log Likelihood & $-201.186 & $-114.545 \\
## Akaike Inf. Crit. & 410.373 & 269.091 \\
## \hline
## \hline \\[-1.8ex]
## \textit{Note:} & \multicolumn{2}{r}{\textit{$^{*}$p$<$0.1; $^{**}$p$<$0.05; $^{***}$p$<$0.01} \\
## \end{tabular}
## \end{table}
```

## what kind of NGOs are more likely to have actual lobbying effects on government decision making?

```
lm5 <- glm(government_policy_change ~ as.factor(party_org) + as.factor(appointee) +
  binary_funding_government + fundingsource_count,
  data = clean_data, family = binomial("logit"))

lm6 <- glm(government_policy_change ~ as.factor(party_org) + as.factor(appointee) +
  binary_funding_government + fundingsource_count +
  budget + as.factor(purpose_policy) + as.factor(spontaneous) +
  as.factor(adm_level) + ind_member + full_time_staff +
  as.factor(past_employment) +
  as.factor(head_adm_level) + time,
  data = clean_data, family = binomial("logit"))
stargazer(lm5, lm6)
```

```
##
## % Table created by stargazer v.5.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu
## % Date and time: Mon, Oct 19, 2015 - 14:03:25
## \begin{table}[!htbp] \centering
##   \caption{}
##   \label{}
## \begin{tabular}{@{\extracolsep{5pt}}lcc}
## \\[-1.8ex] \hline
## \hline \\[-1.8ex]
## & \multicolumn{2}{c}{\textit{Dependent variable:}} \\
## \cline{2-3}
## \\[-1.8ex] & \multicolumn{2}{c}{government\_policy\_change} \\
## \\[-1.8ex] & (1) & (2) \\
## \hline \\[-1.8ex]
## as.factor(party\_org)1 & 0.862$^{***}$ & 0.192 \\
## & (0.300) & (0.511) \\
## & & \\
## as.factor(appointee)1 & 0.246 & 0.197 \\
## & (0.277) & (0.403) \\
## & & \\
## binary\_funding\_government & $-0.045 & $-0.397 \\
## & (0.323) & (0.476) \\
## & & \\
## fundingsource\_count & 0.429$^{***}$ & 0.449$^{**}$
```

```

##      & (0.136) & (0.211) \\
##      & & \\
## budget & & 0.003 \\
##      & & (0.002) \\
##      & & \\
## as.factor(purpose\_policy)1 & & 1.459$^{***}$ \\
##      & & (0.428) \\
##      & & \\
## as.factor(spontaneous)2 & & 0.802 \\
##      & & (0.518) \\
##      & & \\
## as.factor(spontaneous)3 & & 0.466 \\
##      & & (0.504) \\
##      & & \\
## as.factor(adm\_level)2 & & $-$0.464 \\
##      & & (0.502) \\
##      & & \\
## as.factor(adm\_level)3 & & $-$0.390 \\
##      & & (0.665) \\
##      & & \\
## ind\_member & & $-$0.0002 \\
##      & & (0.0002) \\
##      & & \\
## full\_time\_staff & & 0.013 \\
##      & & (0.025) \\
##      & & \\
## as.factor(past\_employment)2 & & 0.344 \\
##      & & (0.541) \\
##      & & \\
## as.factor(past\_employment)3 & & $-$0.365 \\
##      & & (0.511) \\
##      & & \\
## as.factor(past\_employment)4 & & $-$14.123 \\
##      & & (787.129) \\
##      & & \\
## as.factor(past\_employment)5 & & $-$0.603 \\
##      & & (0.829) \\
##      & & \\
## as.factor(head\_adm\_level)2 & & 0.190 \\
##      & & (0.511) \\
##      & & \\
## as.factor(head\_adm\_level)3 & & $-$0.783 \\
##      & & (0.771) \\
##      & & \\
## as.factor(head\_adm\_level)4 & & 0.669 \\
##      & & (1.184) \\
##      & & \\
## time & & 0.022 \\
##      & & (0.019) \\
##      & & \\
## Constant & & $-$2.921$^{***}$ & & $-$3.176$^{***}$ \\
##      & (0.257) & (0.814) \\
##      & & \\
## \hline \\[-1.8ex]

```

```
## Observations & 584 & 347 \\
## Log Likelihood & $-196.115 & $-106.095 \\
## Akaike Inf. Crit. & 402.230 & 254.190 \\
## \hline
## \hline \\[-1.8ex]
## \textit{Note:} & \multicolumn{2}{r}{\textit{\$}^{\textit{*}}\textit{\$}p\textit{\$}<\textit{\$}0.1; \textit{\$}^{\textit{*}}\textit{\$}p\textit{\$}<\textit{\$}0.05; \textit{\$}^{\textit{***}}\textit{\$}p\textit{\$}<\textit{\$}0.01} \\
## \end{tabular}
## \end{table}
```

```
lm7 <- glm(government_policy_change ~ as.factor(party_org) + as.factor(appointee) +
           funding_government_ratio,
           data = clean_data, family = binomial("logit"))

lm8 <- glm(government_policy_change ~ as.factor(party_org) + as.factor(appointee) +
           funding_government_ratio + budget + as.factor(spontaneous) +
           as.factor(purpose_policy) + full_time_staff + ind_member + as.factor(adm_level) +
           as.factor(past_employment) + as.factor(head_adm_level) + time,
           data = clean_data, family = binomial("logit"))
stargazer(lm7, lm8)
```

```
##
## % Table created by stargazer v.5.2 by Marek Hlavac, Harvard University. E-mail: hlavac at fas.harvard.edu
## % Date and time: Mon, Oct 19, 2015 - 14:03:26
## \begin{table}[!htbp] \centering
##   \caption{}
##   \label{}
##   \begin{tabular}{@{\extracolsep{5pt}}lcc}
##     \\[-1.8ex]\hline
##     \hline \\[-1.8ex]
##     & \multicolumn{2}{c}{\textit{Dependent variable:}} \\
##     \cline{2-3}
##     \\[-1.8ex] & \multicolumn{2}{c}{government\_policy\_change} \\
##     \\[-1.8ex] & (1) & (2) \\
##     \hline \\[-1.8ex]
##     as.factor(party\_org)1 & 0.763^{\textit{*}}\textit{\$} & 0.193 \\
##     & (0.341) & (0.561) \\
##     & & \\
##     as.factor(appointee)1 & 0.252 & 0.179 \\
##     & (0.330) & (0.478) \\
##     & & \\
##     funding\_government\_ratio & \textit{\$}-\textit{\$}0.131 & \textit{\$}-\textit{\$}0.623 \\
##     & (0.437) & (0.640) \\
##     & & \\
##     budget & & 0.005^{\textit{*}}\textit{\$} \\
##     & & (0.003) \\
##     & & \\
##     as.factor(spontaneous)2 & & 0.481 \\
##     & & (0.587) \\
##     & & \\
##     as.factor(spontaneous)3 & & 0.318 \\
##     & & (0.575) \\
##     & & \\
##     as.factor(purpose\_policy)1 & & 1.433^{\textit{***}}\textit{\$} \\
##     & & (0.493) \\
##     & & \end{tabular}
```

```

## & & \\
## full\_time\_staff & & 0.012 \\
## & & (0.025) \\
## & & \\
## ind\_member & & $-$0.0002 \\
## & & (0.0002) \\
## & & \\
## as.factor(adm\_level)2 & & $-$0.021 \\
## & & (0.597) \\
## & & \\
## as.factor(adm\_level)3 & & 0.205 \\
## & & (0.809) \\
## & & \\
## as.factor(past\_employment)2 & & 0.208 \\
## & & (0.605) \\
## & & \\
## as.factor(past\_employment)3 & & $-$0.541 \\
## & & (0.586) \\
## & & \\
## as.factor(past\_employment)4 & & $-$15.028 \\
## & & (1,126.699) \\
## & & \\
## as.factor(past\_employment)5 & & $-$1.255 \\
## & & (1.173) \\
## & & \\
## as.factor(head\_adm\_level)2 & & 0.530 \\
## & & (0.602) \\
## & & \\
## as.factor(head\_adm\_level)3 & & $-$0.437 \\
## & & (0.888) \\
## & & \\
## as.factor(head\_adm\_level)4 & & $-$0.445 \\
## & & (1.535) \\
## & & \\
## time & & 0.052$^{**}$ \\
## & & (0.022) \\
## & & \\
## Constant & & $-$1.996$^{***}$ & & $-$2.981$^{***}$ \\
## & & (0.233) & & (0.882) \\
## & & \\
## \hline \\[-1.8ex]
## Observations & 325 & 211 \\
## Log Likelihood & $-$134.822 & $-$77.351 \\
## Akaike Inf. Crit. & 277.644 & 194.701 \\
## \hline
## \hline \\[-1.8ex]
## \textit{Note:} & \multicolumn{2}{r}{$^{*}$p$<$0.1; $^{**}$p$<$0.05; $^{***}$p$<$0.01} \\
## \end{tabular}
## \end{table}

```

```

## through which channel do NGOs affect government policy making
summary(glm(binary_ally ~ log_budget + as.factor(party_org) + fundingsource_count +
  log_budget + log_full_time_staff + as.factor(binary_funding_government) +
  as.factor(binary_funding_government):fundingsource_count +

```

```
as.factor(adm_level) + as.factor(past_employment) + as.factor(appointee) +
as.factor(head_adm_level) + time, data = clean_data,
family = binomial("logit"))
```

```
##
## Call:
## glm(formula = binary_ally ~ log_budget + as.factor(party_org) +
##      fundingsource_count + log_budget + log_full_time_staff +
##      as.factor(binary_funding_government) + as.factor(binary_funding_government):fundingsource_count +
##      as.factor(adm_level) + as.factor(past_employment) + as.factor(appointee) +
##      as.factor(head_adm_level) + time, family = binomial("logit"),
##      data = clean_data)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -0.9911  -0.5363  -0.3964  -0.2743   2.6804
##
## Coefficients:
##                                     Estimate
## (Intercept)                       -2.76492
## log_budget                        -0.03013
## as.factor(party_org)1              -0.11608
## fundingsource_count                0.24765
## log_full_time_staff               0.13873
## as.factor(binary_funding_government)1 1.02930
## as.factor(adm_level)2             -0.65653
## as.factor(adm_level)3              0.23821
## as.factor(past_employment)2        0.69494
## as.factor(past_employment)3        0.08784
## as.factor(past_employment)4        0.95009
## as.factor(past_employment)5       -1.24516
## as.factor(appointee)1              0.51344
## as.factor(head_adm_level)2         -0.06266
## as.factor(head_adm_level)3         -0.14254
## as.factor(head_adm_level)4        -15.06181
## time                             0.01245
## fundingsource_count:as.factor(binary_funding_government)1 -0.30584
##                                     Std. Error
## (Intercept)                       0.73330
## log_budget                        0.12712
## as.factor(party_org)1              0.50021
## fundingsource_count                0.30646
## log_full_time_staff               0.14725
## as.factor(binary_funding_government)1 0.66188
## as.factor(adm_level)2             0.49521
## as.factor(adm_level)3             0.58320
## as.factor(past_employment)2       0.48466
## as.factor(past_employment)3       0.45910
## as.factor(past_employment)4       0.89451
## as.factor(past_employment)5       1.05738
## as.factor(appointee)1             0.35952
## as.factor(head_adm_level)2        0.43422
## as.factor(head_adm_level)3        0.62057
```



```

## as.factor(head_adm_level)4 719.51201
## time 0.01808
## fundingsource_count:as.factor(binary_funding_government)1 0.36601
## z value Pr(>|z|)
## (Intercept) -3.771 0.000163
## log_budget -0.237 0.812637
## as.factor(party_org)1 -0.232 0.816489
## fundingsource_count 0.808 0.419032
## log_full_time_staff 0.942 0.346104
## as.factor(binary_funding_government)1 1.555 0.119919
## as.factor(adm_level)2 -1.326 0.184920
## as.factor(adm_level)3 0.408 0.682941
## as.factor(past_employment)2 1.434 0.151607
## as.factor(past_employment)3 0.191 0.848266
## as.factor(past_employment)4 1.062 0.288176
## as.factor(past_employment)5 -1.178 0.238960
## as.factor(appointee)1 1.428 0.153254
## as.factor(head_adm_level)2 -0.144 0.885258
## as.factor(head_adm_level)3 -0.230 0.818335
## as.factor(head_adm_level)4 -0.021 0.983299
## time 0.689 0.491009
## fundingsource_count:as.factor(binary_funding_government)1 -0.836 0.403382
##
## (Intercept) ***
## log_budget
## as.factor(party_org)1
## fundingsource_count
## log_full_time_staff
## as.factor(binary_funding_government)1
## as.factor(adm_level)2
## as.factor(adm_level)3
## as.factor(past_employment)2
## as.factor(past_employment)3
## as.factor(past_employment)4
## as.factor(past_employment)5
## as.factor(appointee)1
## as.factor(head_adm_level)2
## as.factor(head_adm_level)3
## as.factor(head_adm_level)4
## time
## fundingsource_count:as.factor(binary_funding_government)1
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
## Null deviance: 283.02 on 406 degrees of freedom
## Residual deviance: 259.40 on 389 degrees of freedom
## (716 observations deleted due to missingness)
## AIC: 295.4
##
## Number of Fisher Scoring iterations: 15

```

```
summary(glm(binary_member_phonenletter ~ log_budget + as.factor(party_org) + fundingsource_count +
  log_full_time_staff + as.factor(binary_funding_government) +
  as.factor(binary_funding_government):fundingsource_count +
  as.factor(adm_level) + as.factor(past_employment) + as.factor(head_adm_level) +
  time, data = clean_data, family = binomial("logit")))
```

```
##
## Call:
## glm(formula = binary_member_phonenletter ~ log_budget + as.factor(party_org) +
##      fundingsource_count + log_full_time_staff + as.factor(binary_funding_government) +
##      as.factor(binary_funding_government):fundingsource_count +
##      as.factor(adm_level) + as.factor(past_employment) + as.factor(head_adm_level) +
##      time, family = binomial("logit"), data = clean_data)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -0.8143  -0.3357  -0.2416  -0.1649   2.9607
##
## Coefficients:
##                                     Estimate
## (Intercept)                       -3.341433
## log_budget                        -0.014874
## as.factor(party_org)1              0.493932
## fundingsource_count                -0.207080
## log_full_time_staff                0.387424
## as.factor(binary_funding_government)1 2.045161
## as.factor(adm_level)2              -0.585775
## as.factor(adm_level)3              0.326348
## as.factor(past_employment)2        -0.138498
## as.factor(past_employment)3         0.165270
## as.factor(past_employment)4         0.544702
## as.factor(past_employment)5         0.405102
## as.factor(head_adm_level)2          0.271278
## as.factor(head_adm_level)3          0.056810
## as.factor(head_adm_level)4          1.348698
## time                             -0.003435
## fundingsource_count:as.factor(binary_funding_government)1 -1.369170
##                                     Std. Error
## (Intercept)                       1.109295
## log_budget                        0.193500
## as.factor(party_org)1              0.649302
## fundingsource_count                0.486518
## log_full_time_staff                0.201908
## as.factor(binary_funding_government)1 1.396914
## as.factor(adm_level)2              0.772716
## as.factor(adm_level)3              0.890008
## as.factor(past_employment)2        0.890686
## as.factor(past_employment)3         0.677301
## as.factor(past_employment)4         1.213222
## as.factor(past_employment)5         0.895975
## as.factor(head_adm_level)2          0.672127
## as.factor(head_adm_level)3          0.981226
## as.factor(head_adm_level)4          1.503068
```

```

## time 0.032193
## fundingsource_count:as.factor(binary_funding_government)1 1.057142
## z value Pr(>|z|)
## (Intercept) -3.012 0.00259
## log_budget -0.077 0.93873
## as.factor(party_org)1 0.761 0.44683
## fundingsource_count -0.426 0.67037
## log_full_time_staff 1.919 0.05501
## as.factor(binary_funding_government)1 1.464 0.14318
## as.factor(adm_level)2 -0.758 0.44841
## as.factor(adm_level)3 0.367 0.71386
## as.factor(past_employment)2 -0.155 0.87643
## as.factor(past_employment)3 0.244 0.80722
## as.factor(past_employment)4 0.449 0.65345
## as.factor(past_employment)5 0.452 0.65117
## as.factor(head_adm_level)2 0.404 0.68650
## as.factor(head_adm_level)3 0.058 0.95383
## as.factor(head_adm_level)4 0.897 0.36956
## time -0.107 0.91502
## fundingsource_count:as.factor(binary_funding_government)1 -1.295 0.19526
##
## (Intercept) **
## log_budget
## as.factor(party_org)1
## fundingsource_count
## log_full_time_staff .
## as.factor(binary_funding_government)1
## as.factor(adm_level)2
## as.factor(adm_level)3
## as.factor(past_employment)2
## as.factor(past_employment)3
## as.factor(past_employment)4
## as.factor(past_employment)5
## as.factor(head_adm_level)2
## as.factor(head_adm_level)3
## as.factor(head_adm_level)4
## time
## fundingsource_count:as.factor(binary_funding_government)1
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
## Null deviance: 148.35 on 416 degrees of freedom
## Residual deviance: 134.75 on 400 degrees of freedom
## (706 observations deleted due to missingness)
## AIC: 168.75
##
## Number of Fisher Scoring iterations: 7

```

```

summary(glm(binary_media ~ log_budget + as.factor(party_org) + fundingsource_count +
  as.factor(binary_funding_government) +
  as.factor(binary_funding_government):fundingsource_count + log_full_time_staff +
  as.factor(adm_level) +

```

```
as.factor(past_employment) + as.factor(head_adm_level) +
time, data = clean_data, family = binomial("logit"))
```

```
##
## Call:
## glm(formula = binary_media ~ log_budget + as.factor(party_org) +
##      fundingsource_count + as.factor(binary_funding_government) +
##      as.factor(binary_funding_government):fundingsource_count +
##      log_full_time_staff + as.factor(adm_level) + as.factor(past_employment) +
##      as.factor(head_adm_level) + time, family = binomial("logit"),
##      data = clean_data)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -0.9948  -0.3115  -0.2188  -0.1550   2.8314
##
## Coefficients:
##                                     Estimate
## (Intercept)                      -4.181e+00
## log_budget                        1.358e-01
## as.factor(party_org)1             -2.407e-01
## fundingsource_count               5.776e-01
## as.factor(binary_funding_government)1 5.398e-02
## log_full_time_staff               3.878e-03
## as.factor(adm_level)2             -6.012e-01
## as.factor(adm_level)3             -1.293e-01
## as.factor(past_employment)2       -5.169e-03
## as.factor(past_employment)3       -7.840e-02
## as.factor(past_employment)4       -1.472e+01
## as.factor(past_employment)5       -1.946e-01
## as.factor(head_adm_level)2        7.631e-01
## as.factor(head_adm_level)3        -8.091e-01
## as.factor(head_adm_level)4        -1.632e+01
## time                             2.013e-02
## fundingsource_count:as.factor(binary_funding_government)1 -1.144e-01
##                                     Std. Error
## (Intercept)                      1.109e+00
## log_budget                        1.924e-01
## as.factor(party_org)1             7.847e-01
## fundingsource_count               4.278e-01
## as.factor(binary_funding_government)1 1.142e+00
## log_full_time_staff               2.455e-01
## as.factor(adm_level)2             7.195e-01
## as.factor(adm_level)3             8.568e-01
## as.factor(past_employment)2       7.678e-01
## as.factor(past_employment)3       6.740e-01
## as.factor(past_employment)4       1.784e+03
## as.factor(past_employment)5       1.130e+00
## as.factor(head_adm_level)2        6.921e-01
## as.factor(head_adm_level)3        1.123e+00
## as.factor(head_adm_level)4        1.908e+03
## time                             2.615e-02
## fundingsource_count:as.factor(binary_funding_government)1 5.219e-01
```

```

##                                     z value Pr(>|z|)
## (Intercept)                        -3.770 0.000163
## log_budget                         0.705 0.480503
## as.factor(party_org)1              -0.307 0.759007
## fundingsource_count                1.350 0.176932
## as.factor(binary_funding_government)1 0.047 0.962298
## log_full_time_staff               0.016 0.987398
## as.factor(adm_level)2              -0.836 0.403412
## as.factor(adm_level)3              -0.151 0.880036
## as.factor(past_employment)2        -0.007 0.994629
## as.factor(past_employment)3        -0.116 0.907404
## as.factor(past_employment)4        -0.008 0.993418
## as.factor(past_employment)5        -0.172 0.863286
## as.factor(head_adm_level)2         1.103 0.270218
## as.factor(head_adm_level)3        -0.720 0.471357
## as.factor(head_adm_level)4        -0.009 0.993174
## time                              0.770 0.441458
## fundingsource_count:as.factor(binary_funding_government)1 -0.219 0.826478
##
## (Intercept)                        ***
## log_budget
## as.factor(party_org)1
## fundingsource_count
## as.factor(binary_funding_government)1
## log_full_time_staff
## as.factor(adm_level)2
## as.factor(adm_level)3
## as.factor(past_employment)2
## as.factor(past_employment)3
## as.factor(past_employment)4
## as.factor(past_employment)5
## as.factor(head_adm_level)2
## as.factor(head_adm_level)3
## as.factor(head_adm_level)4
## time
## fundingsource_count:as.factor(binary_funding_government)1
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##    Null deviance: 142.09  on 416  degrees of freedom
## Residual deviance: 125.60  on 400  degrees of freedom
##    (706 observations deleted due to missingness)
## AIC: 159.6
##
## Number of Fisher Scoring iterations: 17

summary(glm(binary_convene_meeting ~ log_budget + as.factor(party_org) + fundingsource_count +
  log_budget:as.factor(party_org) + log_full_time_staff +
  as.factor(adm_level) + as.factor(past_employment) +
  as.factor(head_adm_level) + time, data = clean_data, family = binomial("logit")))

##

```

```
## Call:
## glm(formula = binary_convene_meeting ~ log_budget + as.factor(party_org) +
##      fundingsource_count + log_budget:as.factor(party_org) + log_full_time_staff +
##      as.factor(adm_level) + as.factor(past_employment) + as.factor(head_adm_level) +
##      time, family = binomial("logit"), data = clean_data)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -1.27219  -0.24212  -0.11675  -0.06193   3.13971
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)      -2.59994     1.33405  -1.949   0.0513 .
## log_budget        -0.10871     0.24799  -0.438   0.6611
## as.factor(party_org)1    1.94454     0.78754   2.469   0.0135 *
## fundingsource_count    -0.17334     0.38381  -0.452   0.6515
## log_full_time_staff     0.26998     0.21565   1.252   0.2106
## as.factor(adm_level)2   -2.16884     1.31752  -1.646   0.0997 .
## as.factor(adm_level)3    0.12252     1.07913   0.114   0.9096
## as.factor(past_employment)2  0.04718     0.93209   0.051   0.9596
## as.factor(past_employment)3 -0.06341     0.78908  -0.080   0.9360
## as.factor(past_employment)4 -17.38190    2306.12164  -0.008   0.9940
## as.factor(past_employment)5  -0.36177     0.97788  -0.370   0.7114
## as.factor(head_adm_level)2  -0.16629     0.82508  -0.202   0.8403
## as.factor(head_adm_level)3  -0.73318     1.50721  -0.486   0.6266
## as.factor(head_adm_level)4 -14.73422    2914.21989  -0.005   0.9960
## time                -0.07043     0.06054  -1.163   0.2447
## log_budget:as.factor(party_org)1 -0.49363     0.41765  -1.182   0.2372
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##      Null deviance: 122.577  on 539  degrees of freedom
## Residual deviance:  97.591  on 524  degrees of freedom
## (583 observations deleted due to missingness)
## AIC: 129.59
##
## Number of Fisher Scoring iterations: 18
```

```
summary(glm(binary_meeting ~ log_budget + as.factor(party_org) + fundingsource_count +
log_budget:as.factor(party_org) + log_full_time_staff +
as.factor(adm_level) + as.factor(past_employment) + as.factor(head_adm_level) +
time, data = clean_data, family = binomial("logit")))
```

```
##
## Call:
## glm(formula = binary_meeting ~ log_budget + as.factor(party_org) +
##      fundingsource_count + log_budget:as.factor(party_org) + log_full_time_staff +
##      as.factor(adm_level) + as.factor(past_employment) + as.factor(head_adm_level) +
##      time, family = binomial("logit"), data = clean_data)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
```

```
## -1.8737 -1.0394 -0.7355 1.1709 1.9788
##
## Coefficients:
##
## Estimate Std. Error z value Pr(>|z|)
## (Intercept) -0.47631 0.39092 -1.218 0.223060
## log_budget -0.03487 0.06506 -0.536 0.592045
## as.factor(party_org)1 0.92453 0.41935 2.205 0.027477 *
## fundingsource_count 0.43281 0.11755 3.682 0.000231 ***
## log_full_time_staff 0.05961 0.07962 0.749 0.454035
## as.factor(adm_level)2 -0.14570 0.28062 -0.519 0.603618
## as.factor(adm_level)3 -0.10403 0.33168 -0.314 0.753796
## as.factor(past_employment)2 0.55889 0.29300 1.907 0.056459 .
## as.factor(past_employment)3 -0.06761 0.23946 -0.282 0.777678
## as.factor(past_employment)4 -0.51063 0.58518 -0.873 0.382881
## as.factor(past_employment)5 -0.58961 0.36131 -1.632 0.102708
## as.factor(head_adm_level)2 0.28524 0.24263 1.176 0.239745
## as.factor(head_adm_level)3 -0.18218 0.32366 -0.563 0.573519
## as.factor(head_adm_level)4 -0.18176 0.70070 -0.259 0.795324
## time -0.01595 0.01052 -1.516 0.129478
## log_budget:as.factor(party_org)1 -0.06820 0.13692 -0.498 0.618390
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
## Null deviance: 745.63 on 539 degrees of freedom
## Residual deviance: 697.46 on 524 degrees of freedom
## (583 observations deleted due to missingness)
## AIC: 729.46
##
## Number of Fisher Scoring iterations: 4
```

```
summary(glm(binary_report ~ log_budget + as.factor(party_org) + fundingsource_count +
log_budget:as.factor(party_org) + log_full_time_staff + as.factor(adm_level) +
as.factor(past_employment) + as.factor(head_adm_level) +
time, data = clean_data, family = binomial("logit")))
```

```
##
## Call:
## glm(formula = binary_report ~ log_budget + as.factor(party_org) +
## fundingsource_count + log_budget:as.factor(party_org) + log_full_time_staff +
## as.factor(adm_level) + as.factor(past_employment) + as.factor(head_adm_level) +
## time, family = binomial("logit"), data = clean_data)
##
## Deviance Residuals:
## Min 1Q Median 3Q Max
## -1.8589 -0.8810 -0.6869 1.2027 2.0517
##
## Coefficients:
##
## Estimate Std. Error z value Pr(>|z|)
## (Intercept) -1.113831 0.408178 -2.729 0.00636 **
## log_budget 0.049048 0.068011 0.721 0.47081
## as.factor(party_org)1 0.301403 0.446018 0.676 0.49919
## fundingsource_count 0.318041 0.113313 2.807 0.00500 **
```

```
## log_full_time_staff          -0.080923    0.086786  -0.932    0.35111
## as.factor(adm_level)2        -0.035439    0.283539  -0.125    0.90053
## as.factor(adm_level)3        -0.236656    0.343623  -0.689    0.49101
## as.factor(past_employment)2  -0.125579    0.300592  -0.418    0.67611
## as.factor(past_employment)3  -0.675597    0.265518  -2.544    0.01094 *
## as.factor(past_employment)4  -0.481258    0.679386  -0.708    0.47871
## as.factor(past_employment)5  -0.269869    0.378102  -0.714    0.47538
## as.factor(head_adm_level)2    0.374751    0.257049    1.458    0.14487
## as.factor(head_adm_level)3    0.512400    0.331727    1.545    0.12243
## as.factor(head_adm_level)4    2.000661    0.859938    2.327    0.01999 *
## time                        0.003875    0.010485    0.370    0.71171
## log_budget:as.factor(party_org)1 0.003021    0.147125    0.021    0.98362
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##    Null deviance: 696.73  on 539  degrees of freedom
## Residual deviance: 640.91  on 524  degrees of freedom
##    (583 observations deleted due to missingness)
## AIC: 672.91
##
## Number of Fisher Scoring iterations: 4
```

```
summary(glm(binary_personal_suggestion ~ log_budget + as.factor(party_org) +
  log_budget:as.factor(party_org) + log_full_time_staff + fundingsource_count +
  as.factor(adm_level) + as.factor(past_employment) + as.factor(head_adm_level) +
  time + close_ngos, data = clean_data, family = binomial("logit")))
```

```
##
## Call:
## glm(formula = binary_personal_suggestion ~ log_budget + as.factor(party_org) +
##     log_budget:as.factor(party_org) + log_full_time_staff + fundingsource_count +
##     as.factor(adm_level) + as.factor(past_employment) + as.factor(head_adm_level) +
##     time + close_ngos, family = binomial("logit"), data = clean_data)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -0.9033  -0.4076  -0.3064  -0.1726   3.0692
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)    -5.450e+00  1.583e+00  -3.444  0.000573
## log_budget      -9.866e-02  1.838e-01  -0.537  0.591334
## as.factor(party_org)1  1.052e+00  9.512e-01   1.106  0.268826
## log_full_time_staff -2.631e-01  2.646e-01  -0.994  0.320081
## fundingsource_count  4.360e-01  2.267e-01   1.924  0.054389
## as.factor(adm_level)2  1.846e+00  1.173e+00   1.573  0.115721
## as.factor(adm_level)3  2.280e+00  1.316e+00   1.732  0.083303
## as.factor(past_employment)2  8.736e-02  7.018e-01   0.124  0.900945
## as.factor(past_employment)3  8.969e-02  6.472e-01   0.139  0.889783
## as.factor(past_employment)4 -1.575e+01  2.875e+03  -0.005  0.995629
## as.factor(past_employment)5 -1.567e+01  1.423e+03  -0.011  0.991218
## as.factor(head_adm_level)2  2.553e-01  6.372e-01   0.401  0.688697
```



```

## as.factor(head_adm_level)3      3.463e-01  9.117e-01  0.380 0.704079
## as.factor(head_adm_level)4     -1.458e+01  1.981e+03 -0.007 0.994131
## time                          8.653e-03  2.657e-02  0.326 0.744649
## close_ngos                     1.176e-03  1.425e-02  0.083 0.934223
## log_budget:as.factor(party_org)1 1.042e-01  3.349e-01  0.311 0.755739
##
## (Intercept)                    ***
## log_budget
## as.factor(party_org)1
## log_full_time_staff
## fundingsource_count            .
## as.factor(adm_level)2
## as.factor(adm_level)3          .
## as.factor(past_employment)2
## as.factor(past_employment)3
## as.factor(past_employment)4
## as.factor(past_employment)5
## as.factor(head_adm_level)2
## as.factor(head_adm_level)3
## as.factor(head_adm_level)4
## time
## close_ngos
## log_budget:as.factor(party_org)1
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##    Null deviance: 155.93  on 326  degrees of freedom
## Residual deviance: 139.63  on 310  degrees of freedom
##    (796 observations deleted due to missingness)
## AIC: 173.63
##
## Number of Fisher Scoring iterations: 17

```