NGOs and government

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```r
# 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)
```

```
# observations to be removed from the dataset
# 39 北京市慈善协会
# 96 桐乡市濮院新星学校
# 138 桐乡市庆安乐儿堡幼儿园
# 139 桐乡市和远学校
# 140 桐乡市英才教育培训学校
# 306 桐乡市碧水雅苑·世纪花幼儿园
# 353 浙江省发展侨务事业基金会
# 354 浙江省舟山市东海教育基金会
# 355 诸暨市海亮慈善基金会
# 356 浙江绿色共享教育基金会
# 357 台州职业技术学院涌泉奖助基金会
# 358 泰顺县雅阳教育发展基金会
# 359 浙江中信金通教育基金会
# 361 温州市叶康松慈善基金会
# 362 绍兴县中厦慈善基金会
# 363 浙江圣爱慈善基金会
# 364 浙江永强慈善基金会
# 365 宁海王春文慈善基金会
# 369 浙江横店文荣慈善基金会
# 458 杭州晨星职业技能培训学校
# 485 浙江省绍兴县盛兴慈善基金会
# 486 杭州风起职业专修学校
# 501 杭州健亨中医门诊部
# 502 杭州汽轮医疗门诊部
# 503 杭州微笑行动慈善医院
# 527 临安市玲珑街道大山幼儿园
# 528 临安市博世凯实验小学
# 541 临安骨伤医院
# 542 临安市水涛庄医院
# 543 临安市八百里古文化博物馆
```

544 临安市昌化鸡血石博物馆

545 临安市昌化石博物馆

593 金华艾克医院

594 金华市眼科医院

595 金华国际旅行卫生保健中心

596 农工民主党金华市委门诊部

597 金华视邦眼科门诊部（金华近视治疗中心）

598 三江街道婺江新村社区卫生服务站

599 金华市婺城区江南街道金龙湾社区卫生服务站

600 金华市婺城区西关街道婺星社区卫生服务站

643 义乌市慈善总会

650 义乌市赤岸镇慈善总会

660 义乌市东方医院

661 义乌市双林康复医院（筹）门诊部

662 义乌市復元私立医院

663 义乌市视光眼科医院

664 义乌市新法风湿病医院

665 义乌市近视治疗医院

666 义乌市杭州口腔医院门诊部

693 浦江县第二人民医院

694 浦江县牙病防治所

695 浦江县医学会门诊部

696 天仙骨科医院

697 浦江县卫生学校门诊部

699 北站社区卫生服务站

700 南门社区卫生服务站

701 月泉社区卫生服务站

702 东街社区卫生服务站

703 中山社区卫生服务站

704 康复医院

705 北站仙华路社区卫生服务站

706 广场路（中医）社区卫生服务站

815 嘉兴市秀城区新丰镇慈善协会

```
# 816 嘉兴市秀城区慈善总会
# 820 嘉兴市房管幼儿园
# 821 嘉兴市新思维进修学校
# 822 嘉兴市南湖区大桥镇步云中心幼儿园
# 823 嘉兴市汉伟幼儿园
# 834 东塔门诊部
# 835 嘉兴童天成名老中医诊所 ( 嘉兴名老中医馆 )
# 836 同昌门诊部
# 837 嘉兴市博爱推拿诊所


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 no
# in the empirical analysis
data$category <- data$sa7a
data$category <- as.numeric(data$sa7a)
```

```r
# 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 area
# 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 = "re
legend("topright", legend = c("Actual Distribution","Simulated Normal Distribution"),
       col = c("black", "red"), lty = c(2, 1))
```


**Histogram of number of observations
drawn from each area**
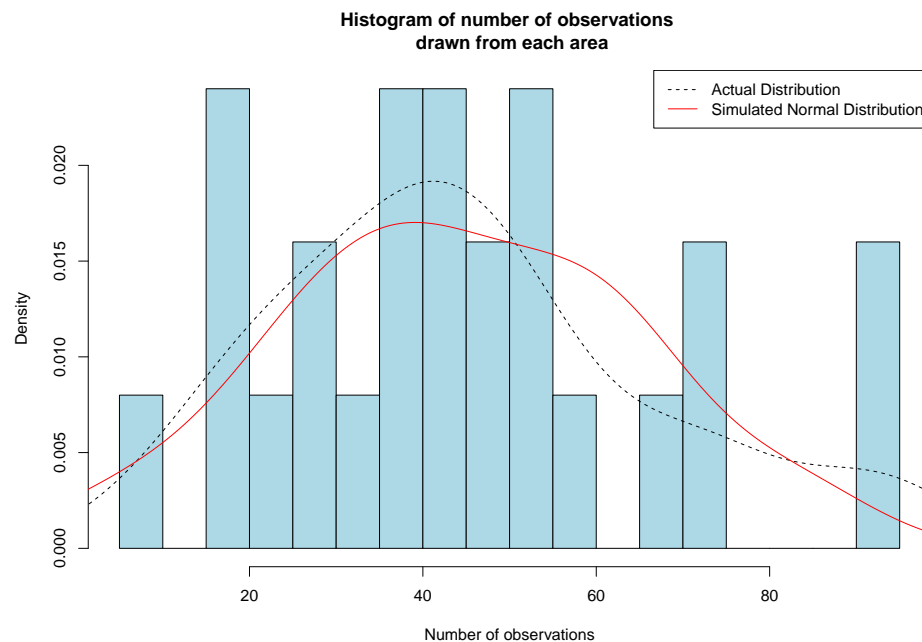
```r
# list the variable names needed for this research
y <- c("category", "area", "Population", "government_policy_change", "government_consul
       "funding_government_ratio", "funding_donation_ratio", "funding_member_ratio",
       "funding_service_ratio", "funding_other_ratio", "media_effects",
       "meeting_times", "meeting_effects", "funding_government", "funding_member","fundi
       "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)
```

```r
# 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
```

```r
# self-reported effects of persuading members to call or write letters to local governm
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
```

```r
# 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
```

```r
# 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
```

```r
# 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
```

```r
# 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
```

```r
# 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
```

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

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

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

```r
# 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
```

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

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

```r
# 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_c
  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"),
```
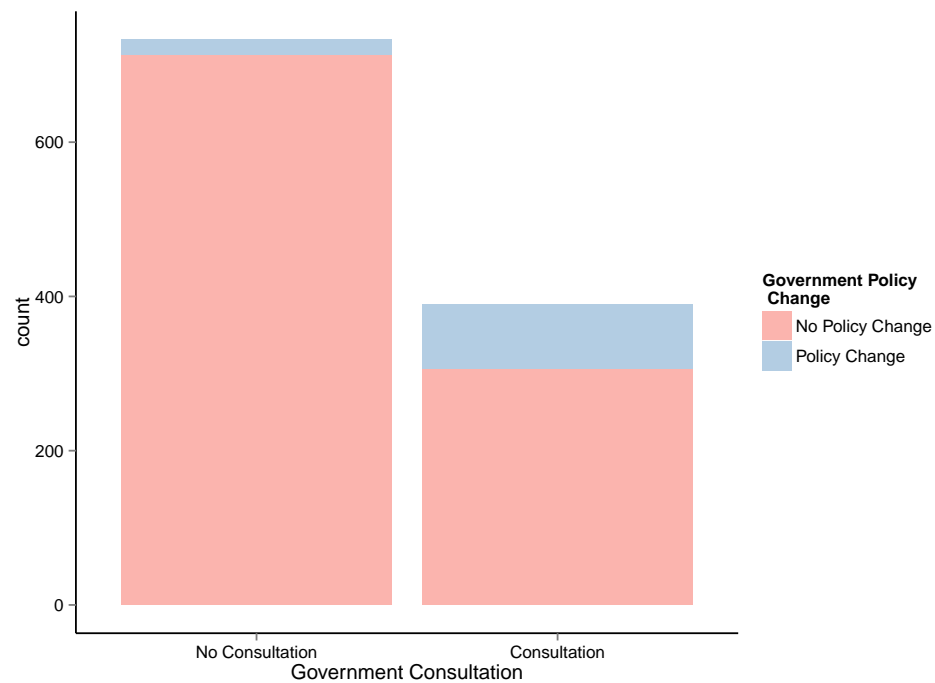
```
                                              axis.text.y=element_text(colour="black")) +
    scale_x_discrete(name = "Government Consultation", breaks=c(0, 1),
                     labels=c("No Consultation", "Consultation")) +
    ggtitle("") +
    labs(fill = "Government Policy \n Change") +
    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
```

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

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

Warning: NAs introduced by coercion

```r
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
data$funding_government[which(data$funding_government >= 3000)] <- data$funding_governm

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

Warning: NAs introduced by coercion

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

# 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
data$funding_donation[which(data$funding_donation >= 1000)] <- data$funding_member[whic

# 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
data$funding_service[which(data$funding_service >= 4000)] <- data$funding_service[which

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

# total income, funding or service revenue received
```

```
data$funding_total <- data$funding_government + data$funding_member + data$funding_serv
    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
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
```

```r
funding <- cbind(data$funding_government, data$funding_member, data$funding_service, da

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 R
     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
       lty = 1:5, cex = 0.7)
# distribution of NGOs' funding sources
hist(data$fundingsource_count, breaks = 25, xlab = "Number of funding sources (b)", mai
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
```

```r
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)
```

```
##         省级 市/区（北京）         县级         NA's
##          194          541          387            1
```

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

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

```r
# 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
```

```r
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 NG
axis(1, at = c(1, 2, 3, 4),labels=c("rank 9 to 13", "rank 8 to 11 ", "rank 5 to 7", "ra

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

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

# 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.fact
  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(spon
  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
```

```r
# 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

# 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
```

```r
# 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
```

```r
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 t
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;
clean_data$binary_personal_suggestion <- recode(clean_data$personal_suggestion, "0 = 0;
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 =
```

Policy purpose when NGOs were foun
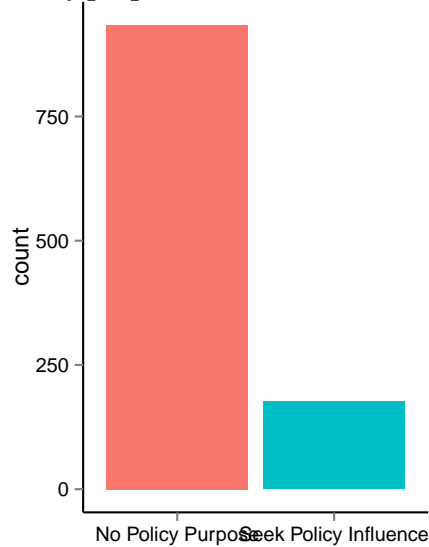
Whether the founding of the NGO is voluntary or decided by governme
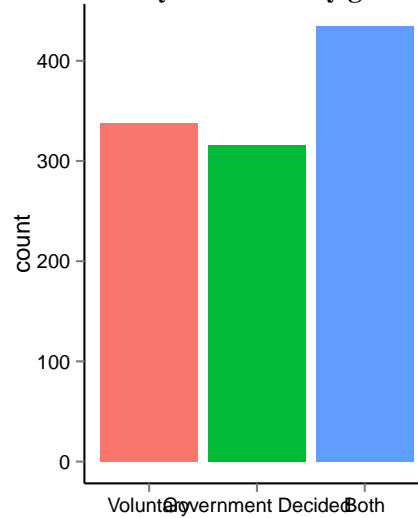
```
##########################
## statistical analysis ##
##########################


## 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
## % Date and time: Mon, Oct 19, 2015 - 17:13:51
## \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 & $-$192.541 \\
## Akaike Inf. Crit. & 724.478 & 427.081 \\
## \hline
## \hline \\[-1.8ex]
## \textit{Note:} & \multicolumn{2}{r}{$^{*}$p$<$0.1; $^{**}$p$<$0.05; $^{***}$p$<$0.01}
## \end{tabular}
## \end{table}
```

```r
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_l
             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
## % Date and time: Mon, Oct 19, 2015 - 17:13:52
## \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 & $-$114.545 \\
## Akaike Inf. Crit. & 410.373 & 269.091 \\
## \hline
## \hline \\[-1.8ex]
## \textit{Note:}  & \multicolumn{2}{r}{$^{*}$p$<$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 deci

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
## % Date and time: Mon, Oct 19, 2015 - 17:13:52
## \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 & $-$106.095 \\
## Akaike Inf. Crit. & 402.230 & 254.190 \\
## \hline
## \hline \\[-1.8ex]
## \textit{Note:} & \multicolumn{2}{r}{$^{*}$p$<$0.1; $^{**}$p$<$0.05; $^{***}$p$<$0.01}
## \end{tabular}
## \end{table}
```

```r
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_l
             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
## % Date and time: Mon, Oct 19, 2015 - 17:13:53
## \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$^{**}$ & 0.193 \\
##    & (0.341) & (0.561) \\
##    & & \\
##  as.factor(appointee)1 & 0.252 & 0.179 \\
##    & (0.330) & (0.478) \\
##    & & \\
##  funding\_government\_ratio & $-$0.131 & $-$0.623 \\
##    & (0.437) & (0.640) \\
##    & & \\
##  budget &  & 0.005$^{*}$ \\
##    &  & (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$^{***}$ \\
##    &  & (0.493) \\
```

```
##   & & \\
##  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}
```

```r
## 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):fundin
##   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
```

```r
summary(glm(binary_member_phonenletter ~ log_budget + as.factor(party_org) + fundingsou
            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_le
            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
```

```r
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_
            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_
            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("l
```

```
##
## 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
```

```r
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_lev
            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
```

```r
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_lev
            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
```

```r
summary(glm(binary_personal_suggestion ~ log_budget + as.factor(party_org) +
            log_budget:as.factor(party_org) + log_full_time_staff + fundingsource_cou
            as.factor(adm_level) + as.factor(past_employment) + as.factor(head_adm_le
            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
```