Masterthesis script

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5/26/2022

```
library(ggplot2)
library(tidyverse)
library(dplyr)
library(forcats)
library(ggplot2)
```

Masterarbeit Script

Deskriptive Analysis

Data is read and prepared in separate file. The variable for the type of voter is created by filtering individuals that lived in the same community for at least ten consecutive votes. For each individual the 10 most recent votes were selected. This allows for the classification of these individuals into "never voters" (0-1 participation), "selective voters" (2-8 participation) and "always voters" (9-10 participation).

TODO: initially I wanted to use source() to get prepared data files, but it takes extremely long (much longer than running the scripts themselves).. Why? Is there a good alternative, since now I have to do the levels and factorization again, since the csv doesn't read them as programmed before...

```
setwd("/Users/alinelaurametzler/Documents/Universität/Master/Master Thesis/MA-Code/")

data <- read.csv("/Users/alinelaurametzler/Documents/Universität/Master/Master Thesis/MA-Code/Data/Prepa
  mutate(beteiligt = as.factor(beteiligt)) %>%
  mutate(beteiligt = fct_relevel(beteiligt, c("keine Stimmbeteiligung", "mit Stimmbeteiligung"))) %>%
   mutate(alter_c = fct_relevel(alter_c, c("18-30-Jährige","31-45-Jährige","46-60-Jährige","61-75-Jährig
          sex = fct_relevel(sex, c("Mann", "Frau")),
          konfession_c = fct_relevel(konfession_c, c("Andere/keine Konfession", "Christliche Konfession"
          residenz10 = fct_relevel(residenz10, c("0-10 Jahre", "Mehr als 10 Jahre")),
          zugezogen = fct_relevel(zugezogen, c("In CH geboren","CH zugezogen")),
          mEinkommen_c = fct_relevel(mEinkommen_c, c("0-25'000.-","25'000-55'000.-","55'000-90'000.-","Ü
          Vermoegen_c = fct_relevel(Vermoegen_c, c("0-8'000.-","8'000-60'000.-","60'000-185'000.-","Über

data_mlogit <- read.csv("/Users/alinelaurametzler/Documents/Universität/Master/Master Thesis/MA-Code/Da
  mutate(vote_type = as.factor(vote_type),
          vote_type_det = as.factor(vote_type_det)) %>%
  mutate(vote_type =  fct_relevel(vote_type, c("never voter", "selective voter", "always voter")),
          vote_type_det =  fct_relevel(vote_type_det, c("never voter","seldom voter","occasional voter",
   mutate(alter_c = fct_relevel(alter_c, c("18-30-Jährige","31-45-Jährige","46-60-Jährige","61-75-Jährig
          sex = fct_relevel(sex, c("Mann", "Frau")),
          konfession_c = fct_relevel(konfession_c, c("Andere/keine Konfession", "Christliche Konfession"
```

```
         residenz10 = fct_relevel(residenz10, c("0-10 Jahre", "Mehr als 10 Jahre")),
         zugezogen = fct_relevel(zugezogen, c("In CH geboren","CH zugezogen")),
         mEinkommen_c = fct_relevel(mEinkommen_c, c("0-25'000.-","25'000-55'000.-","55'000-90'000.-","Ü
         Vermoegen_c = fct_relevel(Vermoegen_c, c("0-8'000.-","8'000-60'000.-","60'000-185'000.-","Über


data_mlogit15 <- read.csv("/Users/alinelaurametzler/Documents/Universität/Master/Master Thesis/MA-Code/
  mutate(vote_type = as.factor(vote_type),
         vote_type_det = as.factor(vote_type_det)) %>%
  mutate(vote_type =  fct_relevel(vote_type, c("never voter", "selective voter", "always voter")),
         vote_type_det =  fct_relevel(vote_type_det, c("never voter","seldom voter","occasional voter",
   mutate(alter_c = fct_relevel(alter_c, c("18-30-Jährige","31-45-Jährige","46-60-Jährige","61-75-Jährig
         sex = fct_relevel(sex, c("Mann", "Frau")),
         konfession_c = fct_relevel(konfession_c, c("Andere/keine Konfession", "Christliche Konfession"
         residenz10 = fct_relevel(residenz10, c("0-10 Jahre", "Mehr als 10 Jahre")),
         zugezogen = fct_relevel(zugezogen, c("In CH geboren","CH zugezogen")),
         mEinkommen_c = fct_relevel(mEinkommen_c, c("0-25'000.-","25'000-55'000.-","55'000-90'000.-","Ü
         Vermoegen_c = fct_relevel(Vermoegen_c, c("0-8'000.-","8'000-60'000.-","60'000-185'000.-","Über


# source("MA_adminDataPreparation.R", local = knitr::knit_global())
```

Distribution of voter types

Hier folgt dann noch eine schöne Tabelle, evtl. mit Kummulierter Haeufigkeit.

```
summary(data_mlogit$vote_type)
```

```
##     never voter selective voter    always voter
##           27830           57811           10847
```

```
summary(data_mlogit$vote_type_det)
```

```
##      never voter     seldom voter occasional voter   frequent voter
##            27830            22405            15236            20170
##     always voter
##            10847
```

```
data_table <- data_mlogit %>%
  group_by(anz_teilnahme) %>%
  summarise(count = n()) %>%
  mutate(cum = cumsum(count)/sum(count)) %>%
  rename(`Anzahl Teilnahme` = anz_teilnahme,
         `Anzahl Individuen` = count,
         `Kummulative Häufigkeit` = cum)


library(xtable)
table <- xtable(data_table)
# print(table)
```

```
library(reactable)
reactable(data_table,
          defaultPageSize = 15,
          columns = list(`Kummulative Häufigkeit` = colDef(format = colFormat(percent = TRUE, digits =
```

Anzahl Teilnahme	Anzahl Individuen	Kummulative Häufigkeit
0	27830	0.28842964928 2812
1	9780	0.38978940386 3693
2	6947	0.46178799436 1993
3	5678	0.52063469032 4185
4	5267	0.57522178923 804
5	4993	0.62696915678 6336
6	4976	0.67854033662 2171
7	5581	0.73638172622 5023
8	6759	0.80643188790 3159
9	7830	0.88758187546 6379
10	10847	1

Scatter Plot Einkommen und Anz. Teilnahmen bei 10 Abstimmungen

H1A/B

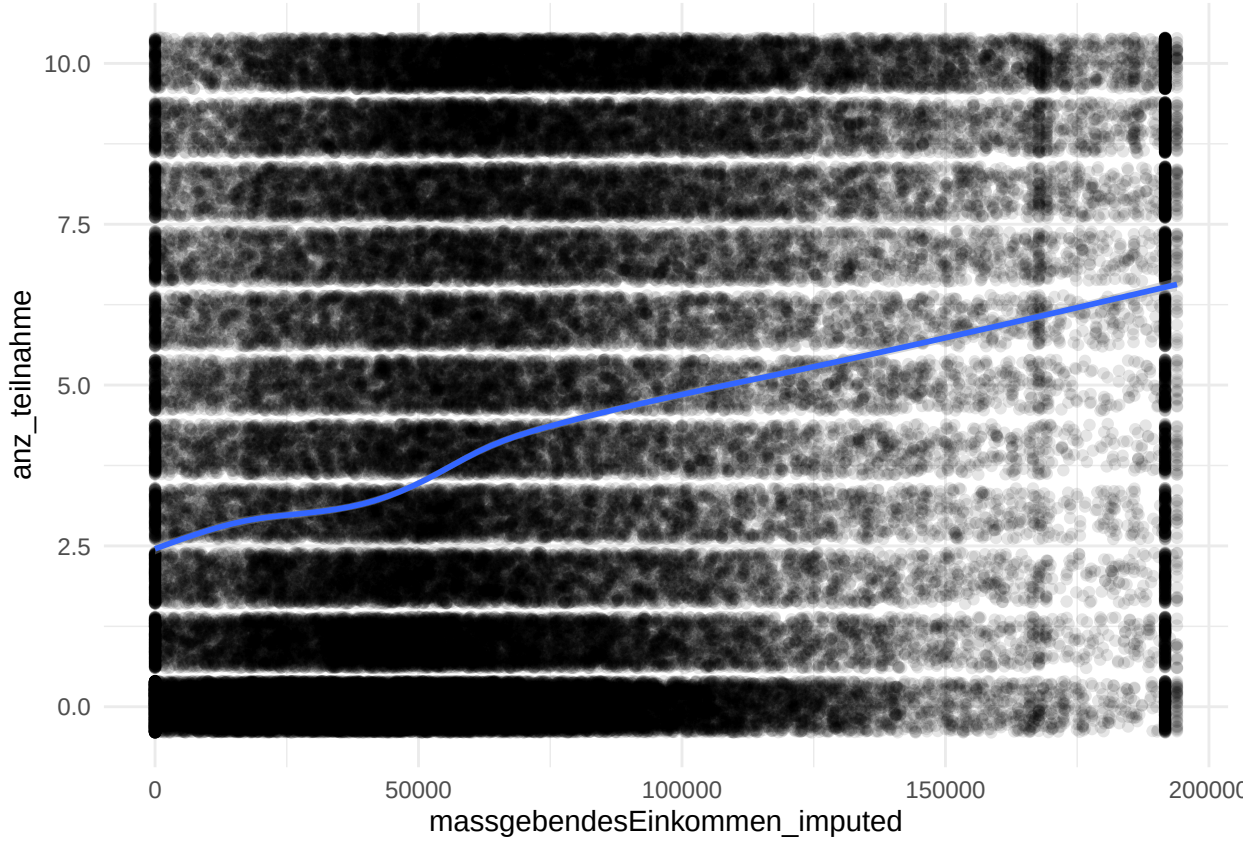
```
summary(data_mlogit$massgebendesEinkommen_imputed)
```

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.      NA's
## -4248547     33775     59712     69000     95689    193935       138
```

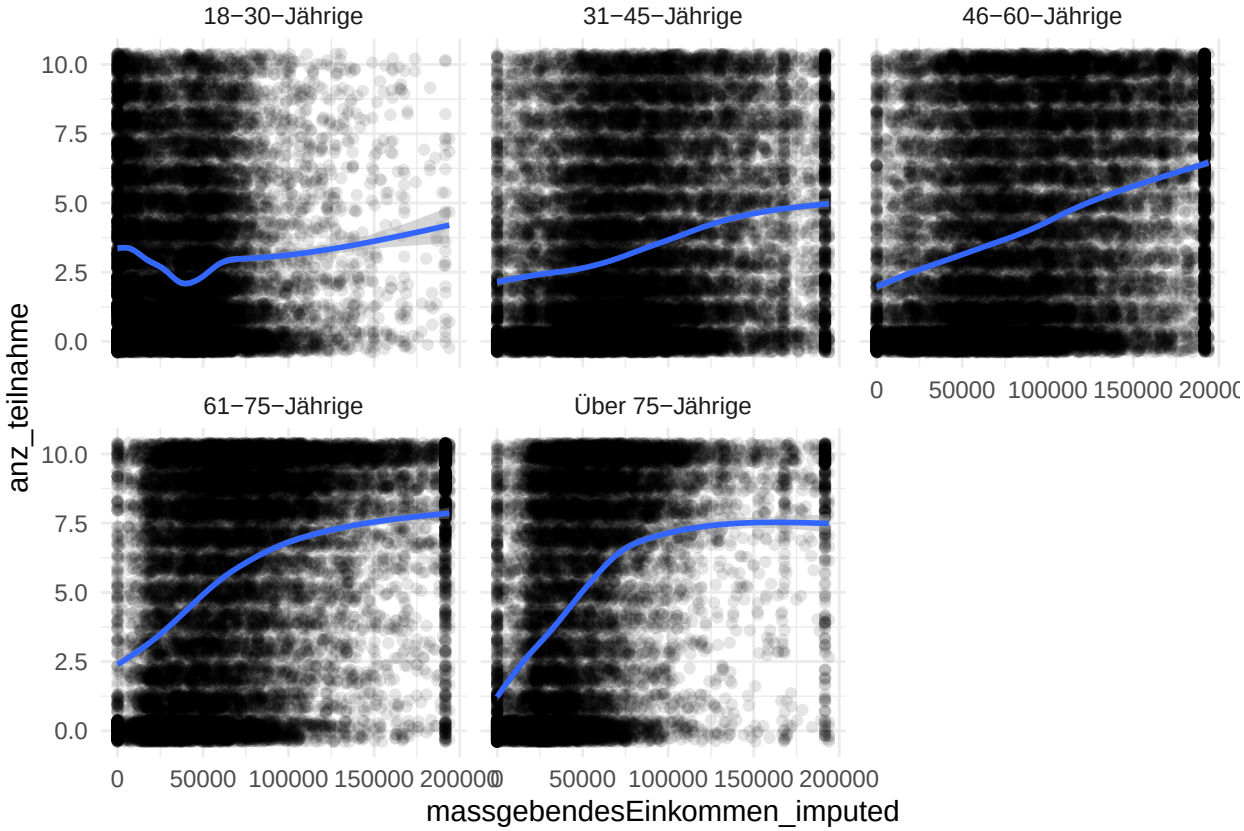
```
summary(data_mlogit$anz_teilnahme)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.000   0.000   3.000   4.028   8.000  10.000
```

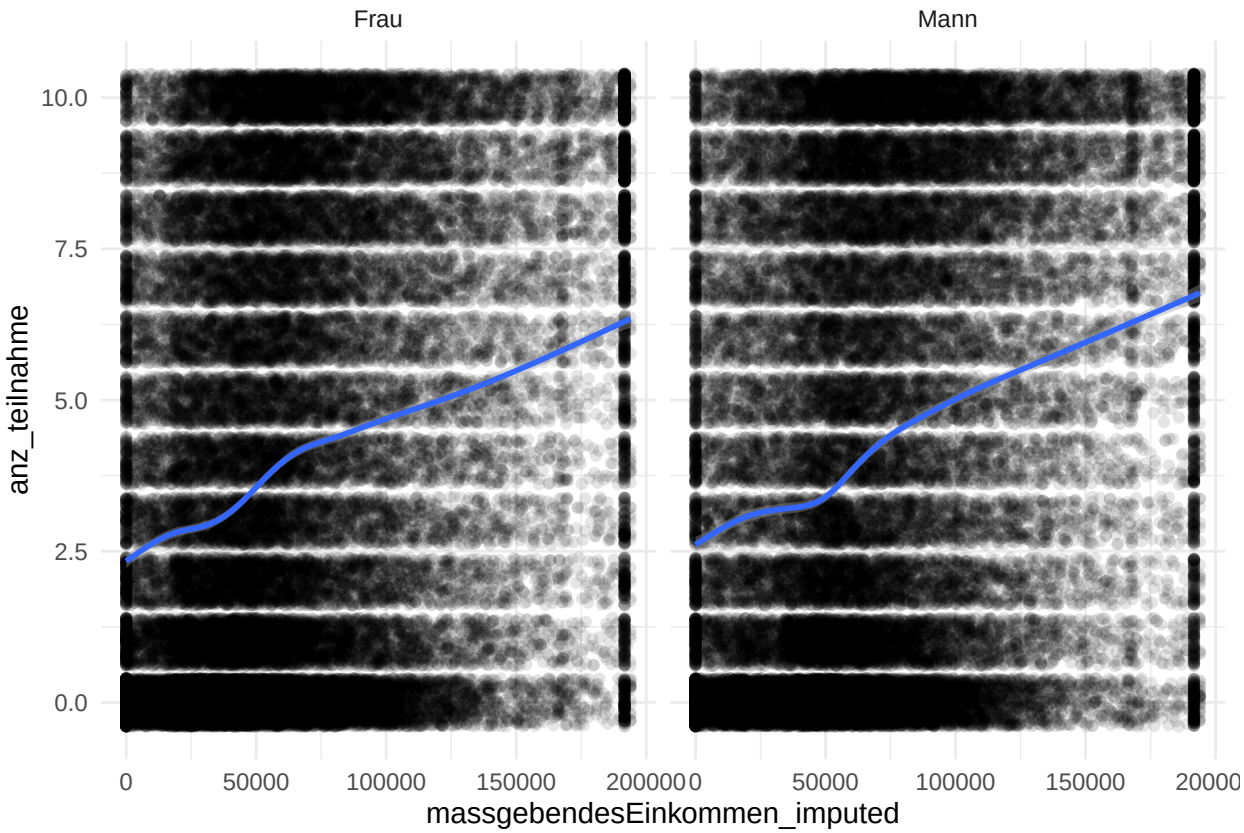
```
plot_scatter <- data_mlogit %>%
  mutate(massgebendesEinkommen_imputed = case_when(
    massgebendesEinkommen_imputed < 0 ~ 0,
    TRUE ~ massgebendesEinkommen_imputed
  )) %>%
  ggplot(aes(x = massgebendesEinkommen_imputed, y = anz_teilnahme)) +
  # geom_bin2d(bins = 10)
  geom_jitter(alpha = 0.1) +
  geom_smooth() +
  theme_minimal()
plot_scatter
```



```r
plot_scatter_age <- data_mlogit %>%
  filter(!is.na(alter_c)) %>%
  mutate(massgebendesEinkommen_imputed = case_when(
    massgebendesEinkommen_imputed < 0 ~ 0,
    TRUE ~ massgebendesEinkommen_imputed
  )) %>%
  ggplot(aes(x = massgebendesEinkommen_imputed, y = anz_teilnahme)) +
  geom_jitter(alpha = 0.1) +
  geom_smooth() +
  facet_wrap(~ alter_c) +
  theme_minimal()
plot_scatter_age
```




```r
plot_scatter_sex <- data_mlogit %>%
  filter(!is.na(sex_c)) %>%
  mutate(massgebendesEinkommen_imputed = case_when(
    massgebendesEinkommen_imputed < 0 ~ 0,
    TRUE ~ massgebendesEinkommen_imputed
  )) %>%
  ggplot(aes(x = massgebendesEinkommen_imputed, y = anz_teilnahme)) +
  geom_jitter(alpha = 0.1) +
  geom_smooth() +
  facet_wrap(~ sex_c) +
  theme_minimal()
plot_scatter_sex
```



Multinomial Logit Model

Was ist der Unterschied zwischen mlogit() und multinom()? Weshalb funktioniert mlogit() nicht und multinom() schon?

H1.1A/B

```
# library(mlogit)
#
# # Generating the Person-Choice Matrix
# data_mlogitprep <- as.data.frame(data_mlogit) %>%
#   select(vote_type, alter_c, sex_c, konfession_c, residenz10, zugezogen, mEinkommen_c, Vermoegen_c) %
#   na.omit()
# data_mlogit.pc <- mlogit.data(data_mlogitprep,
#                               varying = 2:8,
#                               choice = "vote_type",
#                               shape = "wide",
#                               sep = "_")
# head(data_mlogit.pc)
#
# mlogit.fit <- mlogit(vote_type ~ 0 | alter_c + sex_c + konfession_c + residenz10 + zugezogen + mEinko
#                           shape = "long",
#                           data = data_mlogit.pc)

library(nnet)
library(stargazer)
```

```
mlogit <- multinom(vote_type ~ alter_c + sex_c + konfession_c + residenz10 + zugezogen + mEinkommen_c +
                   data = data_mlogit)
```

```
## # weights:  48 (30 variable)
## initial  value 94135.692567
## iter  10 value 72238.419672
## iter  20 value 72086.064590
## iter  30 value 71209.595713
## final  value 71055.884479
## converged
```

```
stargazer(mlogit, type = "text")
```

```
##
## ===================================================================
##                                        Dependent variable:
##                                    ---------------------------
##                                    selective voter always voter
##                                          (1)           (2)
## -------------------------------------------------------------------
## alter_c31-45-Jährige                   -0.371***     -0.260***
##                                         (0.026)       (0.060)
##
## alter_c46-60-Jährige                   -0.349***      0.183***
##                                         (0.027)       (0.058)
##
## alter_c61-75-Jährige                   -0.102***      1.191***
##                                         (0.029)       (0.058)
##
## alter_cÜber 75-Jährige                 -0.498***      0.834***
##                                         (0.031)       (0.060)
##
## sex_cMann                               0.014         0.222***
##                                         (0.017)       (0.026)
##
## konfession_cChristliche Konfession      0.038**       0.111***
##                                         (0.018)       (0.030)
##
## residenz10Mehr als 10 Jahre            0.110***       0.201***
##                                         (0.019)       (0.035)
##
## zugezogenCH zugezogen                  -0.640***     -1.098***
##                                         (0.022)       (0.042)
##
## mEinkommen_c25'000-55'000.-            0.101***       0.297***
##                                         (0.023)       (0.050)
##
## mEinkommen_c55'000-90'000.-            0.400***       0.943***
##                                         (0.026)       (0.050)
##
## mEinkommen_cÜber 90'000.-              0.838***       1.696***
##                                         (0.030)       (0.053)
```

```
##
## Vermoegen_c8'000-60'000.-             0.444***       0.687***
##                                        (0.023)       (0.059)
##
## Vermoegen_c60'000-185'000.-           0.791***       1.221***
##                                        (0.026)       (0.058)
##
## Vermoegen_cÜber 185'000.-             1.212***       1.893***
##                                        (0.027)       (0.056)
##
## Constant                               0.022        -3.599***
##                                        (0.030)       (0.074)
##
## ---------------------------------------------------------------
## Akaike Inf. Crit.                    142,171.800   142,171.800
## ===============================================================
## Note:                              *p<0.1; **p<0.05; ***p<0.01
```

```
mlogit_det <- multinom(vote_type_det ~ alter_c + sex_c + konfession_c + residenz10 + zugezogen + mEinkor
                   data = data_mlogit15)
```

```
## # weights:  80 (60 variable)
## initial  value 122610.199045
## iter  10 value 112769.521412
## iter  20 value 112342.975927
## iter  30 value 111652.496082
## iter  40 value 110999.693572
## iter  50 value 110743.532181
## iter  60 value 110702.484393
## final  value 110694.073162
## converged
```

```
stargazer(mlogit_det, type = "text")
```

```
##
## ===============================================================================================
##                                                 Dependent variable:
##                                    ---------------------------------------------------------
##                                    seldom voter occasional voter frequent voter always voter
##                                        (1)            (2)             (3)           (4)
## -----------------------------------------------------------------------------------------------
## alter_c31-45-Jährige                -0.236***      -0.353***       -0.395***     -0.366***
##                                      (0.035)        (0.040)         (0.042)       (0.058)
##
## alter_c46-60-Jährige                -0.334***      -0.267***       -0.092**      0.197***
##                                      (0.036)        (0.041)         (0.042)       (0.056)
##
## alter_c61-75-Jährige                -0.366***       -0.062         0.496***      1.339***
##                                      (0.040)        (0.044)         (0.043)       (0.055)
##
## alter_cÜber 75-Jährige              -0.599***      -0.361***       0.234***      1.149***
##                                      (0.043)        (0.048)         (0.046)       (0.057)
##
```

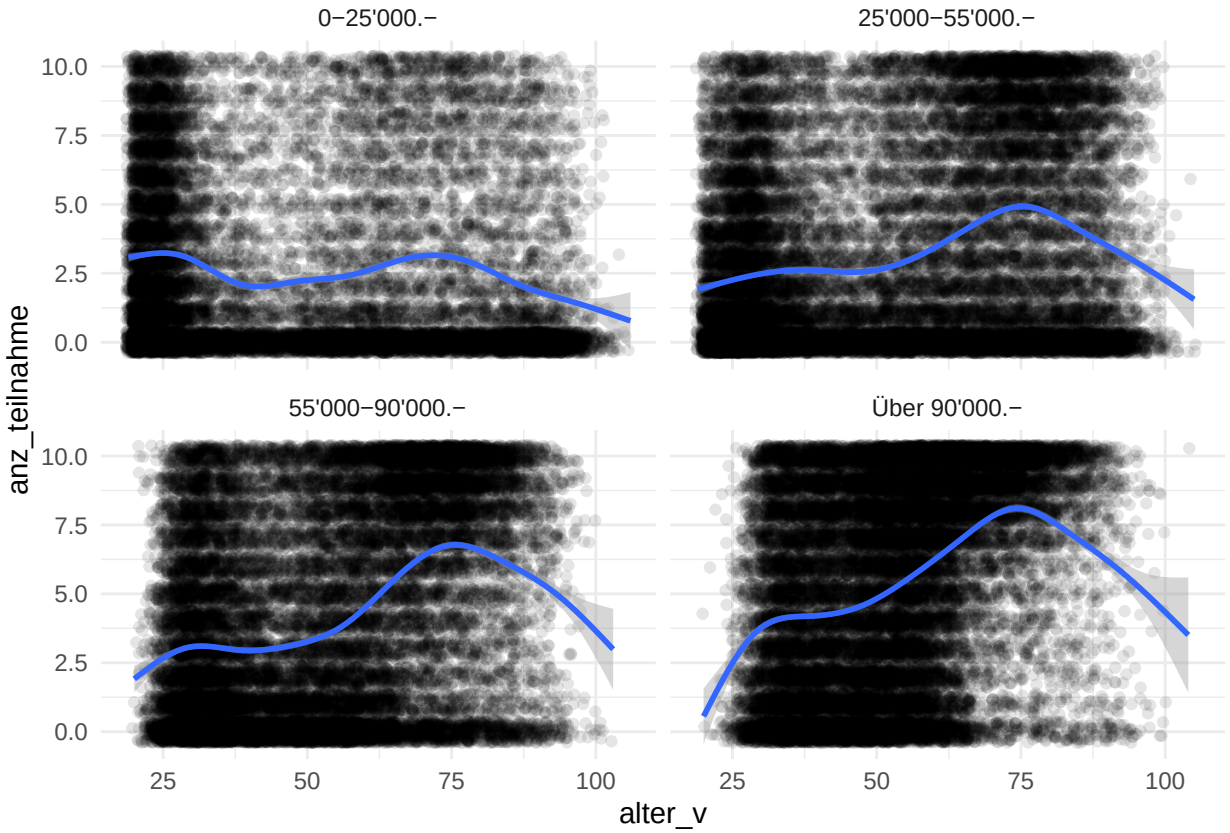
```
## sex_cMann                              -0.005          0.005          0.094***       0.279***
##                                       (0.022)         (0.024)         (0.023)        (0.024)
##
## konfession_cChristliche Konfession     -0.003          0.009           0.028         0.058**
##                                       (0.024)         (0.027)         (0.025)        (0.028)
##
## residenz10Mehr als 10 Jahre           0.086***         -0.033         0.091***       0.135***
##                                       (0.026)         (0.029)         (0.029)        (0.034)
##
## zugezogenCH zugezogen                -0.403***       -0.726***       -0.928***      -1.148***
##                                       (0.030)         (0.035)         (0.034)        (0.038)
##
## mEinkommen_c25'000-55'000.-           0.139***         0.052          0.087**        0.282***
##                                       (0.032)         (0.037)         (0.037)        (0.045)
##
## mEinkommen_c55'000-90'000.-           0.277***        0.289***        0.484***       0.922***
##                                       (0.035)         (0.039)         (0.038)        (0.046)
##
## mEinkommen_cÜber 90'000.-             0.542***        0.620***        1.028***       1.682***
##                                       (0.040)         (0.044)         (0.042)        (0.049)
##
## Vermoegen_c8'000-60'000.-             0.376***        0.496***        0.611***       0.705***
##                                       (0.032)         (0.039)         (0.040)        (0.054)
##
## Vermoegen_c60'000-185'000.-           0.586***        0.928***        1.090***       1.201***
##                                       (0.035)         (0.041)         (0.042)        (0.053)
##
## Vermoegen_cÜber 185'000.-             0.818***        1.312***        1.621***       1.841***
##                                       (0.036)         (0.041)         (0.041)        (0.051)
##
## Constant                             -0.874***       -1.378***       -1.892***      -3.309***
##                                       (0.043)         (0.050)         (0.052)        (0.071)
##
## ------------------------------------------------------------------------------------------------
## Akaike Inf. Crit.                  221,508.100     221,508.100     221,508.100    221,508.100
## ================================================================================================
## Note:                                                            *p<0.1; **p<0.05; ***p<0.01
```

Effect of age on political participation for different income quartiles

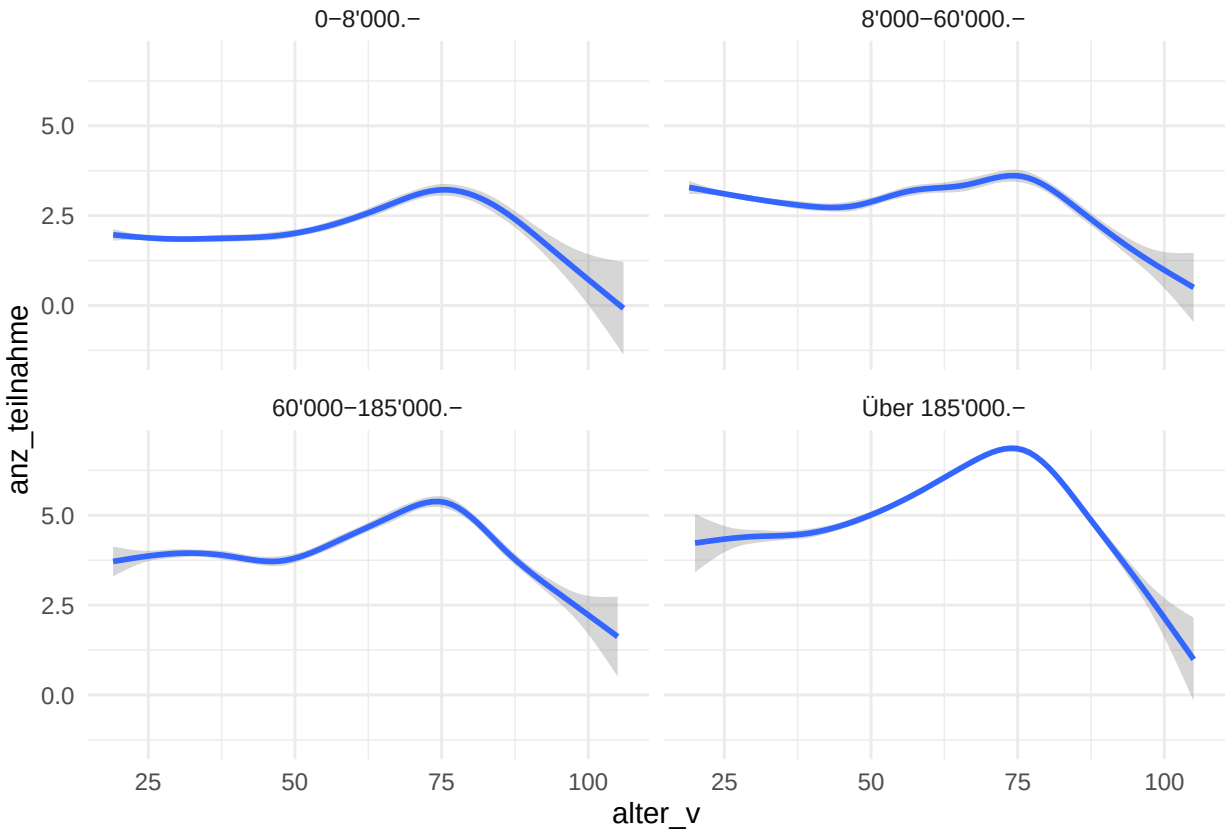
H2

```
plot_scatter_ageincome <- data_mlogit %>%
  filter(!is.na(mEinkommen_c)) %>%
  mutate(massgebendesEinkommen_imputed = case_when(
    massgebendesEinkommen_imputed < 0 ~ 0,
    TRUE ~ massgebendesEinkommen_imputed
  )) %>%
  ggplot(aes(x = alter_v, y = anz_teilnahme)) +
  geom_jitter(alpha = 0.1) +
  geom_smooth() +
  facet_wrap(~ mEinkommen_c) +
  theme_minimal()
```

```
plot_scatter_ageincome
```




```
plot_scatter_agevermoegen <- data_mlogit %>%
  filter(!is.na(mEinkommen_c)) %>%
  mutate(massgebendesEinkommen_imputed = case_when(
    massgebendesEinkommen_imputed < 0 ~ 0,
    TRUE ~ massgebendesEinkommen_imputed
  )) %>%
  ggplot(aes(x = alter_v, y = anz_teilnahme)) +
  # geom_point() +
  # geom_jitter() +
  geom_smooth() +
  facet_wrap(~ Vermoegen_c) +
  theme_minimal()
plot_scatter_agevermoegen
```



Effect of jumps in income/wealth

H3A/B

Identify the jumps

->Since we only have income per year –>participation as share (sum(partic)/sum(all_votes)) –>then look for jumps in yearly income –>compare share of participation before and after

Possible distinctions: 1) From no income to some income 2) From some income to no income 3) From some income to less than 50% of that income 4) From some income to less than 75% of that income

TODO: Do you have a recommendation for defining jumps of income/wealth? And should I address it seperately in the paper?

```
library(data.table)

# TODO: write function to just specify income/wealth and the wanted distinction of jumps

# get aggregated data by year for respondents
data_year <- data %>%
  mutate(anz_teilnahme = case_when(
    beteiligt == "mit Stimmbeteiligung" ~ 1,
    TRUE ~ 0
  )) %>%
  mutate(anz_abstimmungen = case_when(
    beteiligt == "mit Stimmbeteiligung" ~ 1,
    beteiligt == "keine Stimmbeteiligung" ~ 1
```

```
  )) %>%
  group_by(id_ek, abstimmungsjahr) %>%
  summarise(anz_teilnahme = sum(anz_teilnahme),
            anz_abstimmungen = sum(anz_abstimmungen),
            share_teilnahme = anz_teilnahme/anz_abstimmungen,
            sex = last(sex_imp),
            alter = mean(alter_v, na.rm=TRUE),
            konfession = last(konfession_imp),
            residenz = mean(residenz_imp, na.rm=TRUE),
            zugezogen = last(zugezogen),
            einkommen = mean(massgebendesEinkommen_imputed, na.rm=TRUE),
            vermoegen = mean(reinvermoegen_imputed, na.rm=TRUE)
            ) %>%
  distinct() %>%
  ungroup()

# Identify individuals with bigger changes in income or wealth
data_year <- data_year %>%
  group_by(id_ek) %>%
  # calculate change compared to previous year
  mutate(change_eink = 100 * (einkommen - lag(einkommen, default = NA))/lag(einkommen, default = NA)) %
  mutate(change_verm = 100 * (vermoegen - lag(vermoegen, default = NA))/lag(vermoegen, default = NA)) %
  # Identify big changes in income/wealth
  # TODO: when is change considered to be big? (after 50% change?)
  mutate(bigchange_eink = case_when(
    change_eink >= 20 ~ 5,
    change_eink >= 50 ~ 1,
    change_eink <= -50 ~ 2,
    TRUE ~ 0
  )) %>%
  mutate(bigchange_verm = case_when(
    change_verm >= 20 ~ 5,
    change_verm >= 50 ~ 1,
    change_verm <= -50 ~ 2,
    TRUE ~ 0
  )) %>%
  # create variable to detect individuals with treatment (i.e. big income drop)
  # Only valid when also wealth dropped (otherwise just income shift)
  mutate(treat_less50income = case_when(
    bigchange_eink == 2 & bigchange_verm %in% c(0, 5) ~ 1,
    TRUE ~ 0
  )) %>%
  mutate(treat_less50wealth = case_when(
    bigchange_verm == 2 & bigchange_eink %in% c(0, 5) ~ 1,
    TRUE ~ 0
  ))


data_year <- data_year %>%
  # for multiple income/wealth shocks only take first one
  group_by(id_ek) %>%
  mutate(inc_change = as.numeric(rle(treat_less50income)$lengths %>% {rep(seq(length(.)), .)})) %>%
  mutate(wealth_change = as.numeric(rle(treat_less50wealth)$lengths %>% {rep(seq(length(.)), .)})) %>%
```

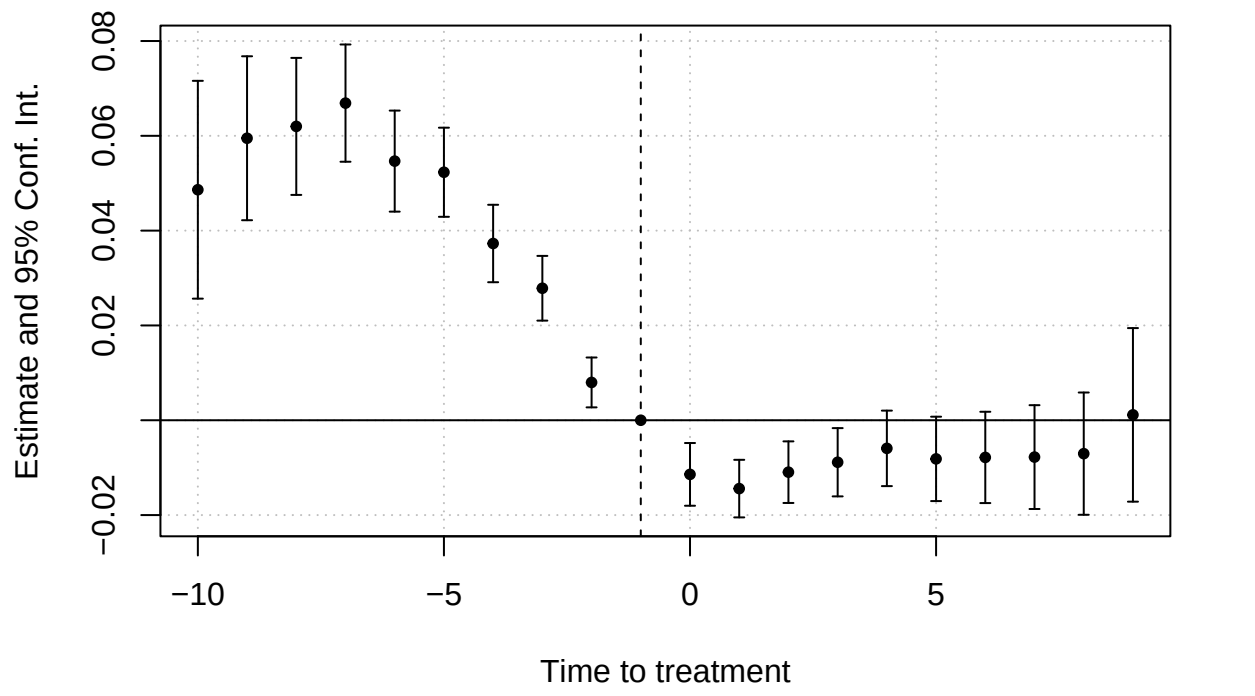
```
  ungroup() %>%
  mutate(inc_change = case_when(
    inc_change > 2 ~ 3,
    TRUE ~ inc_change
  )) %>%
  mutate(wealth_change = case_when(
    wealth_change > 2 ~ 3,
    TRUE ~ wealth_change
  )) %>%
  mutate(treatment_year_inc = case_when(
    inc_change == 2 ~ abstimmungsjahr,
    TRUE ~ NA_integer_
  )) %>%
  mutate(treatment_year_wealth = case_when(
    wealth_change == 2 ~ abstimmungsjahr,
    TRUE ~ NA_integer_
  )) %>%
  group_by(id_ek) %>%
  fill(treatment_year_inc, .direction = "updown") %>%
  fill(treatment_year_wealth, .direction = "updown") %>%
  mutate(treat_less50income = case_when(
    !is.na(treatment_year_inc) ~ 1,
    TRUE ~ 0
  )) %>%
  mutate(treat_less50wealth = case_when(
    !is.na(treatment_year_wealth) ~ 1,
    TRUE ~ 0
  )) %>%
  # create var years from/to treatment. For the never-treated (i.e. control) units,
  # we'll set the "time_to_treatment" value at 0 for the middle year.
  mutate(treatment_year_inc =
           ifelse(is.na(treatment_year_inc), round(mean(abstimmungsjahr)), treatment_year_inc)) %>%
  mutate(treatment_year_wealth =
           ifelse(is.na(treatment_year_wealth), round(mean(abstimmungsjahr)), treatment_year_wealth)) %
  mutate(time_to_treat_inc = ifelse(treat_less50income == 1, (abstimmungsjahr - treatment_year_inc), 0)
  mutate(time_to_treat_wealth = ifelse(treat_less50wealth == 1, (abstimmungsjahr - treatment_year_wealt
```

Difference-in-Differences Event Study

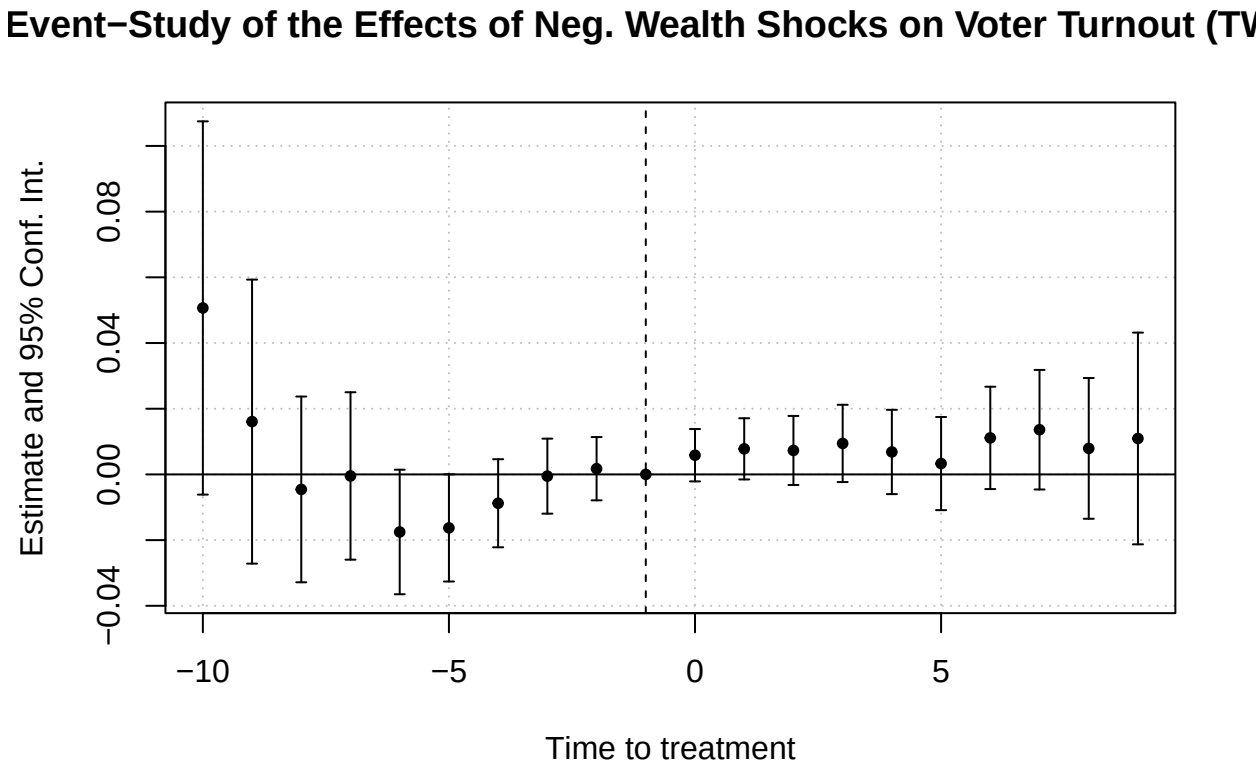
Help: https://lost-stats.github.io/Model_Estimation/Research_Design/event_study.html

```
library(fixest)
# TODO: do I need to account for all control variables in the diff-in-diff model?
# -->how should I handle the categorical ones?

# income shocks
mod_twfe = feols(share_teilnahme ~ i(time_to_treat_inc, treat_less50income, ref = -1) + ## key interact
          alter + einkommen |                ## Other controls
          id_ek + abstimmungsjahr,                   ## FEs
         cluster = ~id_ek,                           ## Clustered SEs
         data = data_year)
```

```
iplot(mod_twfe,
      xlab = 'Time to treatment',
      main = 'Event-Study of the Effects of Neg. Income Shocks on Voter Turnout (TWFE)')
```

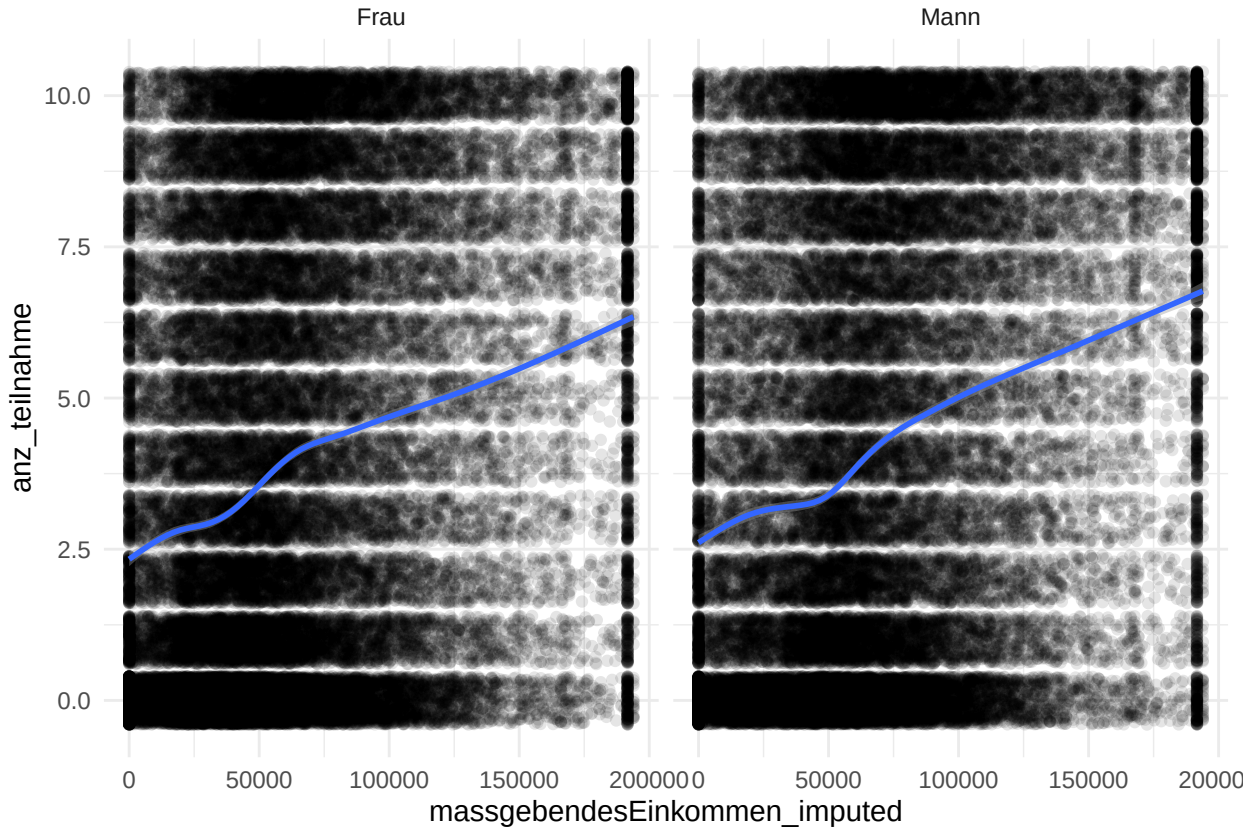



```
# wealth shocks
mod_twfe2 = feols(share_teilnahme ~ i(time_to_treat_wealth, treat_less50income, ref = -1) + ## key inte
          alter + vermoegen |                ## Other controls
          id_ek + abstimmungsjahr,                   ## FEs
         cluster = ~id_ek,                           ## Clustered SEs
         data = data_year)


iplot(mod_twfe2,
      xlab = 'Time to treatment',
      main = 'Event-Study of the Effects of Neg. Wealth Shocks on Voter Turnout (TWFE)')
```



The effect of income is very different depending on the age category!

```
plot_scatter_sex
```



Je geringer die empfundene Relevanz einer Abstimmung ist, desto groesser ist die Rolle, welche das Einkommen bei der Beteiligung am Urnengang spielt.

TODO: Is there a better method to compare the effect of the independent on the dependent variable than just subsetting the group and looking at the estimates?

```
votes <- read.csv("/Users/alinelauraметzler/Documents/Universität/Master/Master Thesis/MA-Code/Data/Prep

# select votes with low/high importance (i.e. lowest/highest quartile of importance)
votes_lowimp <- votes %>%
  filter(quantile(importance, 0.25) >= importance) %>%
  select(datum, titel_kurz_d, jour, mois, annee, importance)
votes_highimp <- votes %>%
  filter(quantile(importance, 0.75) <= importance) %>%
  select(datum, titel_kurz_d, jour, mois, annee, importance)

# join with admin. data
turnout_lowimp <- votes_lowimp %>%
  left_join(data, by = "datum")
turnout_highimp <- votes_highimp %>%
  left_join(data, by = "datum")


# multinomial logit model
mlogit_lowimp <- multinom(beteiligt ~ alter_c + sex_c + konfession_c + residenz10 + zugezogen + mEinkomm
                  data = turnout_lowimp)
```

```
## # weights:  16 (15 variable)
## initial  value 290321.230843
## iter  10 value 260635.182048
## iter  20 value 253380.654245
## iter  20 value 253380.652818
## iter  20 value 253380.652817
## final  value 253380.652817
## converged
```

```
mlogit_highimp <- multinom(beteiligt ~ alter_c + sex_c + konfession_c + residenz10 + zugezogen + mEinkom
                  data = turnout_highimp)
```

```
## # weights:  16 (15 variable)
## initial  value 327324.199929
## iter  10 value 299060.223222
## iter  20 value 295444.989403
## iter  20 value 295444.989375
## iter  20 value 295444.989375
## final  value 295444.989375
## converged
```

```
stargazer(mlogit_lowimp, mlogit_highimp, type = "text")
```

```
##
## ===============================================================
```

```
##                                        Dependent variable:
##                                    ----------------------------
##                                            beteiligt
##                                       (1)            (2)
## ------------------------------------------------------------------
## alter_c31-45-Jährige                -0.173***      -0.205***
##                                      (0.012)        (0.010)
##
## alter_c46-60-Jährige                 0.240***      0.104***
##                                      (0.012)        (0.010)
##
## alter_c61-75-Jährige                 0.877***      0.662***
##                                      (0.012)        (0.011)
##
## alter_cÜber 75-Jährige               0.646***      0.304***
##                                      (0.014)        (0.013)
##
## sex_cMann                            0.131***      0.089***
##                                      (0.007)        (0.006)
##
## konfession_cChristliche Konfession   0.039***        0.009
##                                      (0.008)        (0.007)
##
## residenz10Mehr als 10 Jahre          0.264***      0.154***
##                                      (0.009)        (0.007)
##
## zugezogenCH zugezogen               -0.604***      -0.677***
##                                      (0.010)        (0.009)
##
## mEinkommen_c25'000-55'000.-          0.049***      0.081***
##                                      (0.011)        (0.010)
##
## mEinkommen_c55'000-90'000.-          0.412***      0.426***
##                                      (0.012)        (0.010)
##
## mEinkommen_cÜber 90'000.-            0.851***      0.829***
##                                      (0.013)        (0.011)
##
## Vermoegen_c8'000-60'000.-            0.386***      0.434***
##                                      (0.011)        (0.009)
##
## Vermoegen_c60'000-185'000.-          0.945***      0.931***
##                                      (0.011)        (0.010)
##
## Vermoegen_cÜber 185'000.-            0.665***      0.873***
##                                      (0.012)        (0.011)
##
## Constant                            -1.800***      -1.055***
##                                      (0.014)        (0.012)
##
## ------------------------------------------------------------------
## Akaike Inf. Crit.                  506,791.300    590,920.000
## ==================================================================
## Note:                              *p<0.1; **p<0.05; ***p<0.01
```

Bei Abstimmungen mit einem grösseren Umverteilungsaspekt spielt das Einkommen eine grössere Rolle bei der Beteiligung am Urnengang.

```
# 10.2  Sozialversicherungen
# 6.1   Steuerwesen

votes_umverteilung <- votes %>%
  filter(d1e2 %in% c(6.1, 10.2))

votes_steuern <- votes %>%
  filter(d1e2 == 6.1)


# join with admin. data
turnout_umverteilung<- votes_umverteilung %>%
  left_join(data, by = "datum")
turnout_steuern <- votes_steuern %>%
  left_join(data, by = "datum")


# multinomial logit model
mlogit_umverteilung <- multinom(beteiligt ~ alter_c + sex_c + konfession_c + residenz10 + zugezogen + ml
                   data = turnout_umverteilung)
```

```
## # weights:  16 (15 variable)
## initial  value 188387.699616
## iter  10 value 168350.965178
## iter  20 value 166105.694898
## iter  20 value 166105.694870
## iter  20 value 166105.694870
## final  value 166105.694870
## converged
```

```
mlogit_steuern <- multinom(beteiligt ~ alter_c + sex_c + konfession_c + residenz10 + zugezogen + mEinkor
                   data = turnout_steuern)
```

```
## # weights:  16 (15 variable)
## initial  value 27474.967943
## iter  10 value 24100.346412
## final  value 23799.429944
## converged
```

```
stargazer(mlogit_umverteilung, mlogit_steuern, type = "text")
```

```
##
## ===============================================================
##                                      Dependent variable:
##                                  ---------------------------
##                                          beteiligt
##                                     (1)            (2)
## ---------------------------------------------------------------
```

```
## alter_c31-45-Jährige                -0.159***      -0.137***
##                                      (0.014)        (0.037)
##
## alter_c46-60-Jährige                 0.290***       0.310***
##                                      (0.014)        (0.037)
##
## alter_c61-75-Jährige                 0.896***       1.015***
##                                      (0.015)        (0.040)
##
## alter_cÜber 75-Jährige               0.607***       0.797***
##                                      (0.017)        (0.045)
##
## sex_cMann                            0.085***       0.114***
##                                      (0.008)        (0.023)
##
## konfession_cChristliche Konfession    -0.003         -0.041
##                                      (0.010)        (0.025)
##
## residenz10Mehr als 10 Jahre          0.144***        0.042
##                                      (0.010)        (0.028)
##
## zugezogenCH zugezogen                -0.694***      -0.694***
##                                      (0.012)        (0.031)
##
## mEinkommen_c25'000-55'000.-          0.054***       -0.025
##                                      (0.013)        (0.035)
##
## mEinkommen_c55'000-90'000.-          0.391***       0.309***
##                                      (0.014)        (0.037)
##
## mEinkommen_cÜber 90'000.-            0.791***       0.781***
##                                      (0.015)        (0.040)
##
## Vermoegen_c8'000-60'000.-            0.420***       0.419***
##                                      (0.013)        (0.033)
##
## Vermoegen_c60'000-185'000.-          0.943***       1.041***
##                                      (0.013)        (0.033)
##
## Vermoegen_cÜber 185'000.-            1.024***        0.000
##                                      (0.017)        (0.000)
##
## Constant                             -1.362***      -1.362***
##                                      (0.017)        (0.043)
##
## ---------------------------------------------------------------
## Akaike Inf. Crit.                   332,241.400    47,626.860
## ===============================================================
## Note:                               *p<0.1; **p<0.05; ***p<0.01
```

Der Effekt von hohem Einkommen überträgt sich auch auf die Beteiligung am Urnengang anderer Personen, welche im selben Haushalt leben.

Compare households with high income/wealth to households with low income wealth

Compare highest earning person of household to other members that have less income/wealth –>Especially look at adult children that still live with parents

```
# TODO: can I just  define children by their age group (18-25) living with older age group (35-65)?
# -->what about couples, shared flats with bigger age gaps? (right now I just ignore this)
data_households <- data %>%
  ungroup() %>%
  filter(haushalttyp_sw_2 == "Mehrpersonenhaushalte") %>%
  filter(generationen_sw %in% c("Zwei Generationen", "Drei Generationen", "Vier Generationen")) %>%
  mutate(young_pers = case_when(
    alter_v <= 25 ~ 1,
    TRUE ~ 0
  )) %>%
  mutate(older_pers = case_when(
    alter_v > 35 & alter_v <= 65 ~ 1,
    TRUE ~ 0
  )) %>%
  group_by(householdID_sw) %>%
  # all housholds (mind. 2 generations) with young people and older people in them
  filter(sum(young_pers) >= 1 & sum(older_pers) >= 1) %>%
  # create variable to sum income of parents (=older_pers in household)
  group_by(householdID_sw, older_pers) %>%
  mutate(income_older = case_when(
    # married couples have joined incomes
    steuer_tarif_imputed == "verheiratet" & older_pers == 1 ~ massgebendesEinkommen_imputed,
    steuer_tarif_imputed == "alleinstehend/unverheiratet" & older_pers == 1 ~ sum(massgebendesEinkommen
    TRUE ~ NA_real_
  )) %>%
  ungroup() %>%
  group_by(householdID_sw) %>%
  fill(income_older, .direction = "updown") %>%
  filter(young_pers == 1) %>%
  ungroup() %>%
  filter(!is.na(income_older)) %>%
  # take one random vote date per individual
  group_by(id_ek) %>%
  sample_n(1)


# households with low income of parents
data_households_low <- data_households %>%
  ungroup() %>%
  filter(quantile(income_older, 0.25) >= income_older)

mlogit_household_low <- multinom(beteiligt ~  alter_c + sex_c + konfession_c + residenz10 + zugezogen +
                   data = data_households_low)
```

```
## # weights:  17 (16 variable)
## initial  value 2107.860576
```

```
## iter  10 value 1626.504581
## iter  20 value 1602.862983
## iter  20 value 1602.862983
## iter  20 value 1602.862983
## final  value 1602.862983
## converged
```

```
# households with high income of parents
data_households_high <- data_households %>%
  filter(quantile(income_older, 0.75) <= income_older)

mlogit_household_high <- multinom(beteiligt ~  alter_c + sex_c + konfession_c + residenz10 + zugezogen +
                   data = data_households_high)
```

```
## # weights:  17 (16 variable)
## initial  value 8554.822502
## iter  10 value 7721.138886
## iter  20 value 7397.237759
## final  value 7397.235791
## converged
```

```
stargazer(mlogit_household_low, mlogit_household_high, type = "text")
```

```
##
## ===================================================================
##                                        Dependent variable:
##                                    ----------------------------
##                                            beteiligt
##                                       (1)            (2)
## -------------------------------------------------------------------
## alter_c31-45-Jährige                  0.000          0.000
##                                      (0.000)        (0.000)
##
## alter_c46-60-Jährige                  0.000          0.000
##                                      (0.000)        (0.000)
##
## alter_c61-75-Jährige                  0.000          0.000
##                                      (0.000)        (0.000)
##
## alter_cÜber 75-Jährige                0.000          0.000
##                                      (0.000)        (0.000)
##
## sex_cMann                           -0.138***      -0.079***
##                                      (0.000)        (0.000)
##
## konfession_cChristliche Konfession   0.303***      0.328***
##                                      (0.000)        (0.000)
##
## residenz10Mehr als 10 Jahre          0.373***      0.393***
##                                      (0.000)        (0.000)
##
## zugezogenCH zugezogen                0.061***      0.087***
##                                      (0.000)        (0.000)
```

```
##
## income_older                            0.00000*        0.000
##                                        (0.00000)      (0.00000)
##
## mEinkommen_c25'000-55'000.-            -0.353***      -0.703***
##                                         (0.000)        (0.000)
##
## mEinkommen_c55'000-90'000.-            -0.342***      -0.626***
##                                         (0.000)        (0.000)
##
## mEinkommen_cÜber 90'000.-              -1.427***      -1.003***
##                                         (0.000)        (0.000)
##
## Vermoegen_c8'000-60'000.-               0.860***      0.686***
##                                         (0.000)        (0.000)
##
## Vermoegen_c60'000-185'000.-             1.041***      1.137***
##                                         (0.000)        (0.000)
##
## Vermoegen_cÜber 185'000.-               1.432***      1.033***
##                                         (0.000)        (0.000)
##
## Constant                               -1.902***      -1.479***
##                                         (0.000)        (0.000)
##
## ------------------------------------------------------------------
## Akaike Inf. Crit.                       3,229.726     14,818.470
## ==================================================================
## Note:                                *p<0.1; **p<0.05; ***p<0.01
```

Should I also look at neighborhoods? It is possible for "Kleinquartiere" in the city SG