Individual-level analysis: models

Part of the final project for AQMSS II

Polikanov Stepan and Okisheva Vera

```
source(here::here("utilities", "check_packages.R"))
source(here::here("utilities", "functions.R"))


ep_raw_dep <- read_rds(here("data", "data_built", "ep_raw_dep.rds"))
data_country <- read_rds(here("data", "data_built", "data_country.rds"))


load(here("scripts", "models", "feme_bobyqa.RData"))
load(here("scripts", "models", "nlme_bobyqa.RData"))
load(here("scripts", "models", "me_allfit.RData"))


# Recode no data back to native NA
model_data <- ep_raw_dep |>
  mutate(across(c(sex, age_bin, time_to_vs.less_than_hour,
                  time_to_vs.less_than_hour, out_of_Russia_time,
                  result_trust_bin),
                ~ if_else(. %in% c("No Data", "Declined to answer"), NA, .)),
         vote = relevel(as.factor(vote), ref = "Putin"),
         sex = relevel(as.factor(sex), ref = "Male"),
         age_bin = relevel(as.factor(age_bin), ref = "25-44"),
         out_of_Russia_time = relevel(as.factor(out_of_Russia_time), ref = "Before annexation"),
         result_trust_bin = relevel(as.factor(result_trust_bin), ref = "Yes")) |>
  filter(!countryname_en %in% c("New Zealand", "Australia"))


coef_map_default <- c("(Intercept)", "sexFemale" = "Sex: Female",
                      "sexOther" = "Sex: Other",
                      "age_bin18-24" = "Age: 18-24 (ref 25-44)",
                      "age_bin45-64" = "Age: 45-65 (ref 25-44)",
                      "age_bin65+" = "Age: 65 + (ref 25-44)",
                      "time_to_vs.less_than_hourYes" =
                        "Took < 1 hour to get to the voting station",
                      "out_of_Russia_timeAfter invasion" =
                        "Moved after March 2022 (ref before 2014)",
                      "out_of_Russia_time2 - 5 years" =
                        paste("Moved after March 2019 but before",
                              "March 2022 (ref before 2014)"),
                      "out_of_Russia_timeAfter annexation" =
                        paste("Moved after March 2014 but before",
                              "March 2019 (ref before 2014)"),
                      "out_of_Russia_timeTourist (lives in Russia)" =
                        paste("Didn't move - tourist, lives",
```

```
                "in Russia (ref before 2014)"),
              "result_trust_binDon't know" =
                "Trust in the result: Don't know (ref Yes)",
              "result_trust_binNo" =
                "Trust in the result: No (ref Yes)")
```

Multinomial

```
m2.naive <- multinom(vote ~ sex + age_bin + time_to_vs.less_than_hour
                     + out_of_Russia_time + result_trust_bin,
                     data = model_data, model = F)
```

```
m2.fe <- multinom(vote ~ sex + age_bin + time_to_vs.less_than_hour
                  + out_of_Russia_time + result_trust_bin
                  + as.factor(voting_station),
                  data = model_data, model = F)
```

```
gc()
```

```
            used   (Mb) gc trigger   (Mb)  max used   (Mb)
Ncells   5476757  292.5    9081791  485.1   9081791  485.1
Vcells 137755836 1051.0  219183858 1672.3 182282060 1390.8
```

```
modelsummary(list("Naive approach" = m2.naive),
             output = "kableExtra",
             stars = T, shape = term ~ response,
             coef_map = coef_map_default,
             gof_map = c("nobs", "adj.r.squared", "bic", "rmse")) |>
  kable_styling(latex_options = c("scale_down"))
```

```
gc()
```

```
            used   (Mb) gc trigger   (Mb)  max used   (Mb)
Ncells   5477354  292.6    9081780  485.1   9081780  485.1
Vcells 136849555 1044.1  219183850 1672.3 182372714 1391.4
```

```
modelsummary(list("Fixed Effects" = m2.fe),
             output = "kableExtra",
             stars = T, shape = term ~ response,
             coef_map = coef_map_default,
             gof_map = c("nobs", "adj.r.squared", "bic", "rmse")) |>
  kable_styling(latex_options = c("scale_down"))
```

Table 1: Binary outcomes, linear models, naive approach

```
model_data |>
  pivot_longer(cols = c(vote_putin, vote_declined, vote_putin_declined,
                        vote_davankov, vote_spoiled, vote_opposition)) |>
  nest(data = -name) |>
  transmute(m1.naive = map(data,
                        ~ lm(value ~ sex + age_bin + time_to_vs.less_than_hour
                             + out_of_Russia_time + result_trust_bin,
                             data = .))) |>
  deframe() |>
  set_names(c("Vote Putin", "Decline to Answer", "Putin or Declined",
              "Vote Davankov", "Spoil the ballot", "Vote Davankov or spoil")) |>
  modelsummary(output = "kableExtra", vcov = "robust", stars = T,
               gof_map = c("nobs", "adj.r.squared", "bic", "logLik", "rmse"),
               coef_map = coef_map_default) |>
  kable_styling(latex_options = c("scale_down"))
```

	Vote Putin	Decline to Answer	Putin or Declined	Vote Davankov	Spoil the ballot	Vote Davankov or spoil
Sex: Female	0.010***	0.008***	0.018***	−0.042***	0.028***	−0.014***
	(0.002)	(0.002)	(0.002)	(0.004)	(0.003)	(0.002)
Sex: Other	0.005	0.003	0.008	−0.087***	0.063**	−0.024+
	(0.012)	(0.013)	(0.012)	(0.023)	(0.022)	(0.014)
Age: 18-24 (ref 25-44)	−0.003	0.000	−0.003	0.005	−0.006	−0.001
	(0.002)	(0.002)	(0.003)	(0.006)	(0.006)	(0.004)
Age: 45-65 (ref 25-44)	0.044***	0.015***	0.059***	−0.154***	0.091***	−0.063***
	(0.004)	(0.004)	(0.003)	(0.006)	(0.005)	(0.004)
Age: 65 + (ref 25-44)	0.064***	0.029***	0.093***	−0.152***	0.053***	−0.099***
	(0.008)	(0.007)	(0.005)	(0.007)	(0.006)	(0.005)
Took < 1 hour to get to the voting station	0.001	0.013***	0.014***	−0.013***	−0.004	−0.017***
	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)	(0.002)
Moved after March 2022 (ref before 2014)	−0.048***	−0.020***	−0.067***	0.169***	−0.088***	0.081***
	(0.003)	(0.003)	(0.003)	(0.006)	(0.005)	(0.004)
Moved after March 2019 but before March 2022 (ref before 2014)	−0.042***	−0.017***	−0.059***	0.113***	−0.051***	0.062***
	(0.004)	(0.004)	(0.004)	(0.007)	(0.006)	(0.004)
Moved after March 2014 but before March 2019 (ref before 2014)	−0.034***	−0.016***	−0.049***	0.050***	−0.001	0.049***
	(0.004)	(0.004)	(0.004)	(0.007)	(0.007)	(0.005)
Didn't move - tourist, lives in Russia (ref before 2014)	0.002	−0.015*	−0.013*	0.077***	−0.070***	0.007
	(0.007)	(0.007)	(0.006)	(0.009)	(0.007)	(0.007)
Trust in the result: Don't know (ref Yes)	−0.666***	0.031***	−0.634***	0.436***	0.136***	0.572***
	(0.008)	(0.009)	(0.010)	(0.011)	(0.007)	(0.011)
Trust in the result: No (ref Yes)	−0.731***	−0.081***	−0.812***	0.458***	0.328***	0.786***
	(0.005)	(0.004)	(0.005)	(0.005)	(0.004)	(0.005)
Num.Obs.	54 111	54 111	54 111	54 111	54 111	54 111
R2 Adj.	0.726	0.047	0.763	0.291	0.082	0.668
BIC	−24 139.2	−15 371.5	−20 960.5	59 423.4	50 050.2	2406.8
Log.Lik.	12 145.880	7762.046	10 556.535	−29 635.417	−24 948.803	−1127.086
RMSE	0.19	0.21	0.20	0.42	0.38	0.25

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 2: Multinomial regression, naive approach

	Naive approach					
	Davankov	Declined to answer	Haritonov	Slutsky	Spoiled ballot	Tore up/took
Sex: Female	−0.565***	−0.070	−0.590***	−0.471***	−0.339***	−0.691***
	(0.056)	(0.052)	(0.084)	(0.102)	(0.059)	(0.132)
Sex: Other	−0.503	−0.045	−0.130	0.326	0.022	0.400
	(0.314)	(0.267)	(0.466)	(0.489)	(0.324)	(0.588)
Age: 18-24 (ref 25-44)	0.114	0.106	0.069	0.384*	0.087	0.423*
	(0.105)	(0.111)	(0.147)	(0.161)	(0.109)	(0.203)
Age: 45-65 (ref 25-44)	−1.308***	−0.213***	−0.769***	−0.733***	−0.452***	−0.171
	(0.069)	(0.061)	(0.119)	(0.147)	(0.073)	(0.179)
Age: 65 + (ref 25-44)	−1.870***	−0.091	−0.507**	−0.800**	−0.871***	−0.414
	(0.118)	(0.076)	(0.183)	(0.248)	(0.127)	(0.383)
Took < 1 hour to get to the voting station	−0.326***	0.163**	−0.236**	−0.169	−0.323***	−0.208
	(0.062)	(0.059)	(0.091)	(0.111)	(0.064)	(0.139)
Moved after March 2022 (ref before 2014)	1.877***	0.623***	0.895***	1.086***	1.120***	1.083***
	(0.074)	(0.071)	(0.115)	(0.146)	(0.078)	(0.193)
Moved after March 2019 but before March 2022 (ref before 2014)	1.215***	0.209*	0.638***	0.814***	0.689***	0.975***
	(0.088)	(0.087)	(0.133)	(0.166)	(0.092)	(0.212)
Moved after March 2014 but before March 2019 (ref before 2014)	0.759***	−0.012	0.265+	0.653***	0.532***	0.708**
	(0.096)	(0.093)	(0.151)	(0.179)	(0.100)	(0.234)
Didn't move - tourist, lives in Russia (ref before 2014)	0.332**	−0.244*	−0.069	0.517*	−0.524***	−0.206
	(0.113)	(0.099)	(0.201)	(0.216)	(0.130)	(0.395)
Trust in the result: Don't know (ref Yes)	4.100***	2.287***	3.350***	3.594***	3.890***	2.617***
	(0.105)	(0.110)	(0.186)	(0.192)	(0.156)	(0.667)
Trust in the result: No (ref Yes)	7.153***	3.648***	5.779***	5.259***	8.187***	7.097***
	(0.099)	(0.100)	(0.145)	(0.161)	(0.130)	(0.341)
Num.Obs.	54 111					
R2 Adj.	0.533					
BIC	89 346.1					
RMSE	0.25					

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 3: Multinomial regression, fixed effects

	Fixed Effects					
	Davankov	Declined to answer	Haritonov	Slutsky	Spoiled ballot	Tore up/took
Sex: Female	−0.452***	0.092+	−0.403***	−0.321**	−0.248***	−0.644***
	(0.059)	(0.054)	(0.090)	(0.113)	(0.062)	(0.147)
Sex: Other	−0.679*	−0.232	−0.302	0.196	−0.174	0.257
	(0.318)	(0.274)	(0.489)	(0.517)	(0.328)	(0.617)
Age: 18-24 (ref 25-44)	0.072	0.088	−0.115	0.324+	0.001	0.466*
	(0.112)	(0.117)	(0.164)	(0.180)	(0.116)	(0.227)
Age: 45-65 (ref 25-44)	−1.289***	−0.287***	−0.735***	−0.715***	−0.439***	0.004
	(0.073)	(0.063)	(0.127)	(0.163)	(0.077)	(0.195)
Age: 65 + (ref 25-44)	−1.757***	−0.387***	−0.350+	−0.763**	−0.811***	−0.399
	(0.120)	(0.082)	(0.197)	(0.292)	(0.133)	(0.465)
Took < 1 hour to get to the voting station	−0.030	0.273***	0.113	0.075	0.001	0.050
	(0.071)	(0.066)	(0.107)	(0.134)	(0.073)	(0.172)
Moved after March 2022 (ref before 2014)	2.183***	0.796***	1.319***	1.300***	1.647***	1.704***
	(0.087)	(0.083)	(0.137)	(0.179)	(0.092)	(0.240)
Moved after March 2019 but before March 2022 (ref before 2014)	1.399***	0.402***	0.869***	0.974***	0.929***	1.316***
	(0.096)	(0.093)	(0.146)	(0.187)	(0.100)	(0.248)
Moved after March 2014 but before March 2019 (ref before 2014)	0.854***	0.154	0.378*	0.846***	0.619***	1.030***
	(0.101)	(0.096)	(0.161)	(0.195)	(0.106)	(0.260)
Didn't move - tourist, lives in Russia (ref before 2014)	0.786***	0.231*	0.373+	0.949***	0.197	0.609
	(0.126)	(0.109)	(0.225)	(0.254)	(0.142)	(0.467)
Trust in the result: Don't know (ref Yes)	3.918***	2.318***	3.527***	3.927***	3.713***	−3.139***
	(0.109)	(0.115)	(0.198)	(0.225)	(0.159)	(0.005)
Trust in the result: No (ref Yes)	7.630***	4.343***	6.554***	6.311***	8.689***	11.848***
	(0.137)	(0.138)	(0.184)	(0.215)	(0.160)	(2.603)
Num.Obs.	54 111					
R2 Adj.	0.542					
BIC	91 620.5					
RMSE	0.25					

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

```r
comparisons <- logits(answer = dichotomy(answer = c("Davankov",
                                                    "Spoiled ballot",
                                                    "Slutsky",
                                                    "Haritonov",
                                                    "Putin"),
                                         "Declined to answer"),
                      not_putin = dichotomy(opposition = c("Davankov",
                                                           "Spoiled ballot",
                                                           "Slutsky",
                                                           "Haritonov"),
                                            "Putin"),
                      opposition = dichotomy(
                        systemic = c("Slutsky", "Haritonov"),
                        nonsystemic = c("Davankov", "Spoiled ballot")),
                      nonsystemic = c("Spoiled ballot", "Davankov"),
                      systemic = c("Haritonov", "Slutsky"))

m3.nested <- nestedLogit(vote ~ sex + age_bin + time_to_vs.less_than_hour
                         + out_of_Russia_time + result_trust_bin,
                         dichotomies = comparisons,
                         data = model_data,
                         subset = model_data$vote != "Tore up/took"
                        | !is.na(model_data$vote))

m3.nested.fe <- nestedLogit(vote ~ sex + age_bin + time_to_vs.less_than_hour
                         + out_of_Russia_time + result_trust_bin + as.factor(voting_station),
                         dichotomies = comparisons,
                         data = model_data,
                         subset = model_data$vote != "Tore up/took"
                        | !is.na(model_data$vote))

save(list = c("m3.nested", "m3.nested.fe"),
     file = here("scripts", "models", "nl_fe.RData"))


resizebox.stargazer(models(m3.nested),
          title = "Nested Logit models", header = F,
          dep.var.labels = c("Don't answer vs answer", "Putin vs everyone",
                             "Non-systemic vs systemic opposition",
                             "Spoiled vs Davankov", "Slutsky vs Haritonov"),
          covariate.labels = c(
            "Sex: Female", "Sex: Other", "Age: 18-24 (ref 25-44)",
            "Age: 45-65 (ref 25-44)", "Age: 65 + (ref 25-44)",
            "Took < 1 hour to get to the voting station",
            "Moved after March 2022 (ref before 2014)",
            "Moved after March 2019 but before March 2022 (ref before 2014)",
            "Moved after March 2014 but before March 2019 (ref before 2014)",
            "Didn't move - tourist, lives in Russia (ref before 2014)",
            "Trust in the result: Don't know (ref Yes)",
            "Trust in the result: No (ref Yes)", "Intercept"),
          tab.height = "\\textheight", tab.width= "\\textwidth"
          )



resizebox.stargazer(models(m3.nested.fe),
          title = "Nested Logit models, fixed effects", header = F,
          dep.var.labels = c("Don't answer vs answer", "Putin vs everyone",
                             "Non-systemic vs systemic opposition",
                             "Spoiled vs Davankov", "Slutsky vs Haritonov"),
```

Table 4: Nested Logit models

	Dependent variable:				
	Don't answer vs answer	Putin vs everyone	Non-systemic vs systemic opposition	Spoiled vs Davankov	Slutsky vs Haritonov
	(1)	(2)	(3)	(4)	(5)
Sex: Female	0.192***	0.510***	0.022	−0.220***	0.155
	(0.043)	(0.069)	(0.056)	(0.024)	(0.115)
Sex: Other	0.088	−0.138	−0.383	−0.517***	0.423
	(0.234)	(0.372)	(0.298)	(0.146)	(0.573)
Age: 18-24 (ref 25-44)	0.004	−0.132	−0.079	0.025	0.327*
	(0.080)	(0.118)	(0.085)	(0.036)	(0.170)
Age: 45-65 (ref 25-44)	0.249***	1.336***	−0.308***	−0.836***	0.007
	(0.057)	(0.083)	(0.087)	(0.039)	(0.179)
Age: 65 + (ref 25-44)	0.339***	1.542***	−0.939***	−0.959***	−0.424
	(0.074)	(0.127)	(0.154)	(0.106)	(0.305)
Took < 1 hour to get to the voting station	0.349***	0.368***	−0.107*	−0.001	0.034
	(0.049)	(0.075)	(0.059)	(0.024)	(0.122)
Moved after March 2022 (ref before 2014)	−0.294***	−1.413***	0.401***	0.513***	0.148
	(0.073)	(0.103)	(0.090)	(0.041)	(0.187)
Moved after March 2019 but before March 2022 (ref before 2014)	−0.227***	−0.816***	0.292***	0.217***	0.387*
	(0.078)	(0.116)	(0.102)	(0.045)	(0.208)
Moved after March 2014 but before March 2019 (ref before 2014)	−0.412***	−1.991***	0.741***	0.742***	0.163
	(0.062)	(0.087)	(0.080)	(0.036)	(0.166)
Didn't move - tourist, lives in Russia (ref before 2014)	−0.200**	−0.530***	−0.001	0.858***	0.542**
	(0.090)	(0.130)	(0.141)	(0.084)	(0.274)
Trust in the result: Don't know (ref Yes)	0.438***	−4.040***	0.708***	0.403***	0.253
	(0.080)	(0.105)	(0.127)	(0.140)	(0.239)
Trust in the result: No (ref Yes)	−1.381***	−7.365***	1.913***	−0.809***	−0.548***
	(0.057)	(0.099)	(0.094)	(0.106)	(0.183)
Intercept	−2.404***	1.881***	1.276***	1.466***	−0.466**
	(0.072)	(0.098)	(0.119)	(0.111)	(0.229)
Observations	53,824	51,202	42,363	40,946	1,417
Log Likelihood	−9,435.706	−3,530.187	−5,869.120	−22,756.890	−911.162
Akaike Inf. Crit.	18,897.410	7,086.374	11,764.240	45,539.780	1,848.323

Note: *p<0.1; **p<0.05; ***p<0.01

```
covariate.labels = c(
  "Sex: Female", "Sex: Other", "Age: 18-24 (ref 25-44)",
  "Age: 45-65 (ref 25-44)", "Age: 65 + (ref 25-44)",
  "Took < 1 hour to get to the voting station",
  "Moved after March 2022 (ref before 2014)",
  "Moved after March 2019 but before March 2022 (ref before 2014)",
  "Moved after March 2014 but before March 2019 (ref before 2014)",
  "Didn't move - tourist, lives in Russia (ref before 2014)",
  "Trust in the result: Don't know (ref Yes)",
  "Trust in the result: No (ref Yes)", "Intercept"),
omit = "as.factor",
tab.height = "\\textheight", tab.width= "\\textwidth"
)
```

Table 5: Nested Logit models, fixed effects

	Dependent variable:				
	Don't answer vs answer	Putin vs everyone	Non-systemic vs systemic opposition	Spoiled vs Davankov	Slutsky vs Haritonov
	(1)	(2)	(3)	(4)	(5)
Sex: Female	0.275***	0.481***	0.019	−0.195***	0.121
	(0.044)	(0.072)	(0.057)	(0.024)	(0.120)
Sex: Other	0.039	0.208	−0.371	−0.455***	0.331
	(0.240)	(0.369)	(0.301)	(0.146)	(0.589)
Age: 18-24 (ref 25-44)	−0.008	0.019	−0.114	0.072*	0.335*
	(0.082)	(0.126)	(0.088)	(0.037)	(0.183)
Age: 45-65 (ref 25-44)	0.172***	1.304***	−0.294***	−0.827***	0.011
	(0.059)	(0.087)	(0.088)	(0.039)	(0.190)
Age: 65 + (ref 25-44)	0.161**	1.501***	−0.994***	−0.952***	−0.461
	(0.078)	(0.132)	(0.159)	(0.107)	(0.322)
Took < 1 hour to get to the voting station	0.310***	0.071	−0.086	−0.028	−0.114
	(0.055)	(0.085)	(0.067)	(0.027)	(0.144)
Moved after March 2022 (ref before 2014)	−0.217***	−1.467***	0.419***	0.438***	0.149
	(0.075)	(0.110)	(0.093)	(0.042)	(0.200)
Moved after March 2019 but before March 2022 (ref before 2014)	−0.179**	−0.798***	0.299***	0.213***	0.455**
	(0.081)	(0.121)	(0.103)	(0.046)	(0.220)
Moved after March 2014 but before March 2019 (ref before 2014)	−0.363***	−2.357***	0.820***	0.539***	0.093
	(0.069)	(0.103)	(0.090)	(0.040)	(0.191)
Didn't move - tourist, lives in Russia (ref before 2014)	−0.002	−0.997***	0.134	0.633***	0.410
	(0.098)	(0.146)	(0.150)	(0.088)	(0.300)
Trust in the result: Don't know (ref Yes)	0.521***	−3.955***	0.716***	0.392***	0.241
	(0.083)	(0.110)	(0.129)	(0.141)	(0.250)
Trust in the result: No (ref Yes)	−1.293***	−7.204***	1.891***	−0.804***	−0.552***
	(0.060)	(0.102)	(0.095)	(0.106)	(0.193)
Intercept	−2.146***	1.379***	1.223***	1.401***	−0.644
	(0.144)	(0.247)	(0.198)	(0.130)	(0.400)
Observations	53,824	51,202	42,363	40,946	1,417
Log Likelihood	−9,008.215	−3,287.206	−5,809.709	−22,553.850	−878.176
Akaike Inf. Crit.	18,166.430	6,724.412	11,769.420	45,257.690	1,900.352

Note: *p<0.1; **p<0.05; ***p<0.01

Mixed effects models

Nested Logit

```
# Drop Australia and New Zealand for this because they have very skewed and low
# n observations. Might also help with convergence
nested_me_data <- model_data |>
  filter(vote != "Tore up/took", !countryname_en %in% c("Australia",
                                                        "New Zealand")) |>
  mutate(non_answer = if_else(vote == "Declined to answer", 1, 0),
         putin_else = case_when(vote == "Putin" ~ 1,
                                vote %in% c("Davankov", "Spoiled ballot",
                                            "Slutsky", "Haritonov") ~ 0,
                                .default = NA),
         nonsys_sys = case_when(vote %in% c("Davankov", "Spoiled ballot") ~ 1,
                                vote %in% c("Slutsky", "Haritonov") ~ 0,
                                .default = NA),
         davankov_spoiled = case_when(vote == "Davankov" ~ 1,
                                      vote == "Spoiled ballot" ~ 0,
                                      .default = NA),
         slutsky_haritonov = case_when(vote == "Slutsky" ~ 1,
                                       vote == "Haritonov" ~ 0,
                                       .default = NA)) |>
  left_join(data_country, by = c("countrycode_n", "countrycode_c"))
```

We fit the model consecutively for each dichotomy this time separating data by hand in the same way as the `nestedLogit` package does.

For some models we get non-convergence. We diagnose which optimizers work fine in those case and update the model to achieve convergence.

```
# Answer (1) vs non-answer (0)
m4a.nested <- glmer(non_answer ~ sex + age_bin + time_to_vs.less_than_hour
                    + out_of_Russia_time + result_trust_bin
                    + (1 | countryname_en.x),
                    data = nested_me_data, family = binomial,
                    control = glmerControl(optimizer = "bobyqa"))

# Fit using all optimizers
# m4.allfit <- allFit(m4a.nested)

# bobyqa works so use that in the previous call (no reason to estimate it again
# for knitr destruction reasons)
summary(m4a.nested)
```

Not answer v answer

```r
# Add second-level predicotrs
m5a.nested <- glmer(non_answer ~ sex + age_bin + time_to_vs.less_than_hour
                    + out_of_Russia_time + result_trust_bin
                    + orthodox_share + vdem_polyarchy_2022
                    + log(mad_gdppc_2018) + obl_type + export_share
                    + import_share + friendly_status + help + military_dummy
                    + log(dist) + (1 | countryname_en.x),
                    data = nested_me_data, family = binomial,
                    control = glmerControl(optimizer = "bobyqa",
                                           optCtrl = list(maxfun = 1e9)))
  # Doesn't converge


derivs1 <- m5a.nested@optinfo$derivs
sc_grad1 <- with(derivs1,solve(Hessian,gradient))
max(abs(sc_grad1))
```

```
[1] 0.005623852
```

```r
max(pmin(abs(sc_grad1),abs(derivs1$gradient)))
```

```
[1] 0.002404067
```

```r
dd <- update(m5a.nested,devFunOnly=TRUE)
pars <- unlist(getME(m5a.nested,c("theta","fixef")))
grad2 <- grad(dd,pars)
hess2 <- hessian(dd,pars)
sc_grad2 <- solve(hess2,grad2)
max(pmin(abs(sc_grad2),abs(grad2)))
```

```
[1] 0.002430115
```

```r
# Fit with all optimizers
# m5a.allfit <- allFit(m5a.nested, maxfun = 1e9)

# No options seem to work
m5a.allfit_OK <- m5a.allfit[sapply(m5a.allfit, is, "merMod")]
lapply(m5a.allfit_OK, function(x) x@optinfo$conv$lme4$messages)
```

```
$bobyqa
[1] "Model failed to converge with max|grad| = 0.00240407 (tol = 0.002, component 1)"

$Nelder_Mead
[1] "Model failed to converge with max|grad| = 0.0288314 (tol = 0.002, component 1)"

$nlminbwrap
[1] "Model failed to converge with max|grad| = 0.071349 (tol = 0.002, component 1)"
```

```
$nmkbw
[1] "Model failed to converge with max|grad| = 0.0112403 (tol = 0.002, component 1)"

$`optimx.L-BFGS-B`
[1] "unable to evaluate scaled gradient"
[2] "Model failed to converge: degenerate  Hessian with 1 negative eigenvalues"

$nloptwrap.NLOPT_LN_NELDERMEAD
[1] "unable to evaluate scaled gradient"
[2] "Model failed to converge: degenerate  Hessian with 1 negative eigenvalues"

$nloptwrap.NLOPT_LN_BOBYQA
[1] "Model failed to converge with max|grad| = 0.0450179 (tol = 0.002, component 1)"
```

```
# The gradient cutoffs for Nelder Mead (nlopt), bobyqa and nlminwrap seem to
# be close to what I am getting.

# Check for singular fit
tt <- getME(m5a.nested,"theta")
ll <- getME(m5a.nested,"lower")
min(tt[ll==0]) # Nope, no singular fit
```

```
[1] 0.4415713
```

```
# The only other thing to try is to see whether the coefficients change in unconverged models
is.OK <- sapply(m5a.allfit, is, "merMod")
m5a.allfit.OK <- m5a.allfit[is.OK]
lapply(m5a.allfit.OK,function(x) x@optinfo$conv$lme4$messages)
```

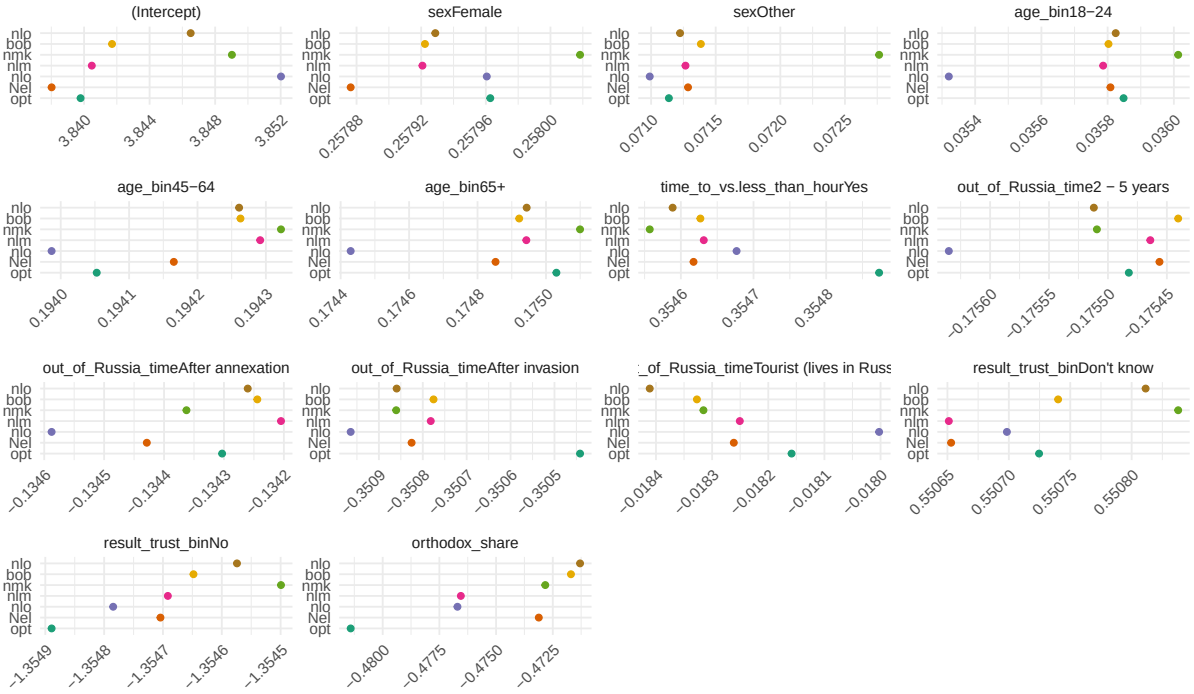
```
$bobyqa
[1] "Model failed to converge with max|grad| = 0.00240407 (tol = 0.002, component 1)"

$Nelder_Mead
[1] "Model failed to converge with max|grad| = 0.0288314 (tol = 0.002, component 1)"

$nlminbwrap
[1] "Model failed to converge with max|grad| = 0.071349 (tol = 0.002, component 1)"

$nmkbw
[1] "Model failed to converge with max|grad| = 0.0112403 (tol = 0.002, component 1)"

$`optimx.L-BFGS-B`
[1] "unable to evaluate scaled gradient"
```

```
[2] "Model failed to converge: degenerate  Hessian with 1 negative eigenvalues"

$nloptwrap.NLOPT_LN_NELDERMEAD
[1] "unable to evaluate scaled gradient"
[2] "Model failed to converge: degenerate  Hessian with 1 negative eigenvalues"

$nloptwrap.NLOPT_LN_BOBYQA
[1] "Model failed to converge with max|grad| = 0.0450179 (tol = 0.002, component 1)"
```

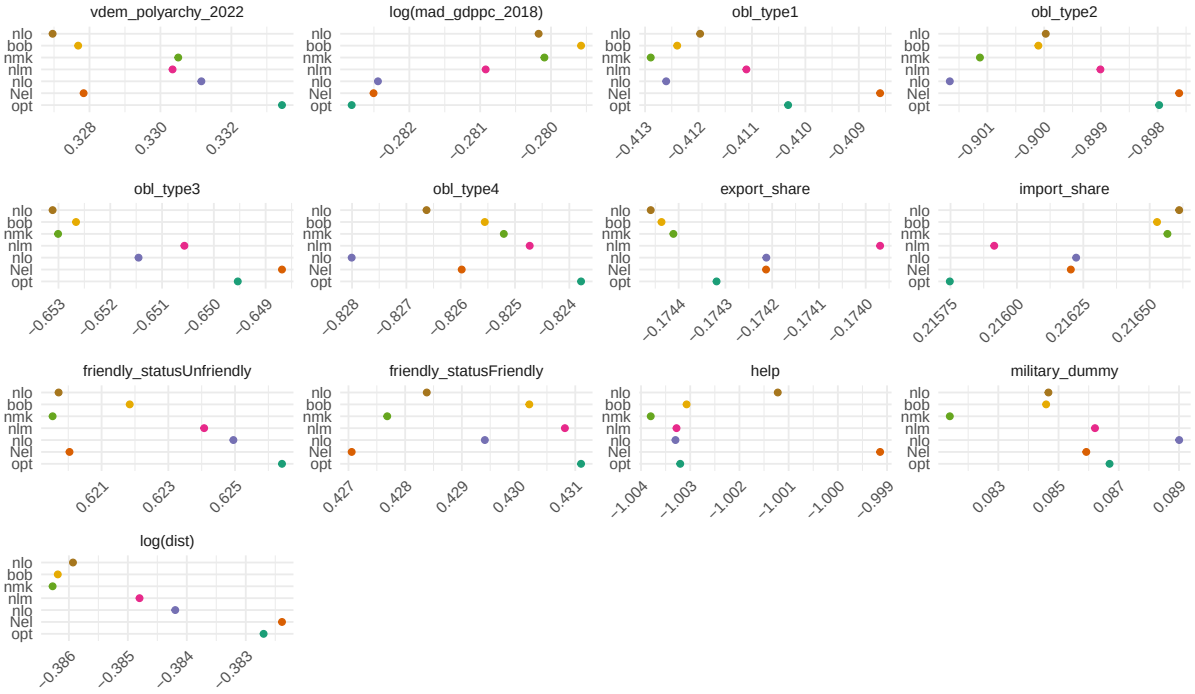
```
(lliks <- sort(sapply(m5a.allfit.OK,logLik)))
```

```
              optimx.L-BFGS-B                  Nelder_Mead
                     -8472.303                    -8472.302
    nloptwrap.NLOPT_LN_BOBYQA                    nlminbwrap
                     -8472.302                    -8472.302
                         nmkbw                       bobyqa
                     -8472.302                    -8472.302
nloptwrap.NLOPT_LN_NELDERMEAD
                     -8472.302
```

```
m5a.allfit.fixef <- t(sapply(m5a.allfit.OK,fixef))
m5a.allfit.fixef.m <- melt(m5a.allfit.fixef)
models <- levels(m5a.allfit.fixef.m$Var1)
m5a.allfit.fixef.m <- transform(m5a.allfit.fixef.m, Var1 = factor(Var1, levels = names(lliks)))

ggplot(m5a.allfit.fixef.m[1:98, ],
       aes(x = value, y = Var1, colour = Var1)) +
  geom_point() +
  facet_wrap(~ Var2, scale = "free") +
  scale_colour_brewer(palette = "Dark2") +
  scale_y_discrete(breaks = models,
                   labels = substr(models, 1, 3)) +
  labs(x = "", y = "") +
  theme_minimal() +
  theme(legend.position = "none",
        axis.text.x = element_text(angle = 45, hjust = 1))
```




```
ggplot(m5a.allfit.fixef.m[99:189, ],
       aes(x = value, y = Var1, colour = Var1)) +
  geom_point() +
  facet_wrap(~ Var2, scale = "free") +
  scale_colour_brewer(palette = "Dark2") +
  scale_y_discrete(breaks = models,
                   labels = substr(models, 1, 3)) +
  labs(x = "", y = "") +
  theme_minimal() +
  theme(legend.position = "none",
        axis.text.x = element_text(angle = 45, hjust = 1))
```




```
# So judging by this I leave the model alone - the coefficients seem to be okay
# between different optimizers and since bobyqa comes close to the tolerance
# threshold, I will use it.
```

Putin v everyone else

```
# Putin (1) vs everyone else (0), declined to answer NA
m4p.nested <- glmer(putin_else ~ sex + age_bin + time_to_vs.less_than_hour
                    + out_of_Russia_time + result_trust_bin
                    + (1 | countryname_en.x),
                    data = nested_me_data, family = binomial,
                    control = glmerControl(optimizer = "bobyqa"))

# Converges!
summary(m4p.nested)


m5p.nested <- glmer(putin_else ~ sex + age_bin + time_to_vs.less_than_hour
                    + out_of_Russia_time + result_trust_bin
                    + orthodox_share + vdem_polyarchy_2022
                    + log(mad_gdppc_2018) + obl_type + export_share
                    + import_share + friendly_status + help + military_dummy
                    + log(dist) + (1 | countryname_en.x),
                    data = nested_me_data, family = binomial,
                    control = glmerControl(optimizer = "bobyqa",
                                           optCtrl = list(maxfun = 1e9)))
```

```
derivs1 <- m5p.nested@optinfo$derivs
sc_grad1 <- with(derivs1,solve(Hessian,gradient))
max(abs(sc_grad1))
```

```
[1] 0.02388267
```

```
max(pmin(abs(sc_grad1),abs(derivs1$gradient)))
```

```
[1] 0.01320501
```

```
dd <- update(m5p.nested,devFunOnly=TRUE)
pars <- unlist(getME(m5p.nested,c("theta","fixef")))
grad2 <- grad(dd,pars)
hess2 <- hessian(dd,pars)
sc_grad2 <- solve(hess2,grad2)
max(pmin(abs(sc_grad2),abs(grad2)))
```

```
[1] 0.01319967
```

```
# Fit with all optimizers (loaded with other models)
# m5p.allfit <- allFit(m5p.nested, maxfun = 1e9)

# No options seem to work
m5p.allfit_OK <- m5p.allfit[sapply(m5p.allfit, is, "merMod")]
lapply(m5p.allfit_OK, function(x) x@optinfo$conv$lme4$messages)
```

```
$bobyqa
[1] "Model failed to converge with max|grad| = 0.00486188 (tol = 0.002, component 1)"

$Nelder_Mead
[1] "Model failed to converge with max|grad| = 0.0439094 (tol = 0.002, component 1)"

$nlminbwrap
[1] "Model failed to converge with max|grad| = 0.0198981 (tol = 0.002, component 1)"

$nmkbw
[1] "Model failed to converge with max|grad| = 0.0321358 (tol = 0.002, component 1)"

$`optimx.L-BFGS-B`
[1] "Model failed to converge with max|grad| = 0.0818325 (tol = 0.002, component 1)"

$nloptwrap.NLOPT_LN_NELDERMEAD
[1] "Model failed to converge with max|grad| = 0.0240685 (tol = 0.002, component 1)"
```

```
$nloptwrap.NLOPT_LN_BOBYQA
[1] "Model failed to converge with max|grad| = 0.0277748 (tol = 0.002, component 1)"
```

```
# Check for singular fit
tt <- getME(m5p.nested,"theta")
ll <- getME(m5p.nested,"lower")
min(tt[ll==0]) # Nope, no singular fit
```

```
[1] 0.3402741
```

```
# The only other thing to try is to see whether the coefficients change in unconverged models
is.OK <- sapply(m5p.allfit, is, "merMod")
m5p.allfit.OK <- m5p.allfit[is.OK]
lapply(m5p.allfit.OK,function(x) x@optinfo$conv$lme4$messages)
```

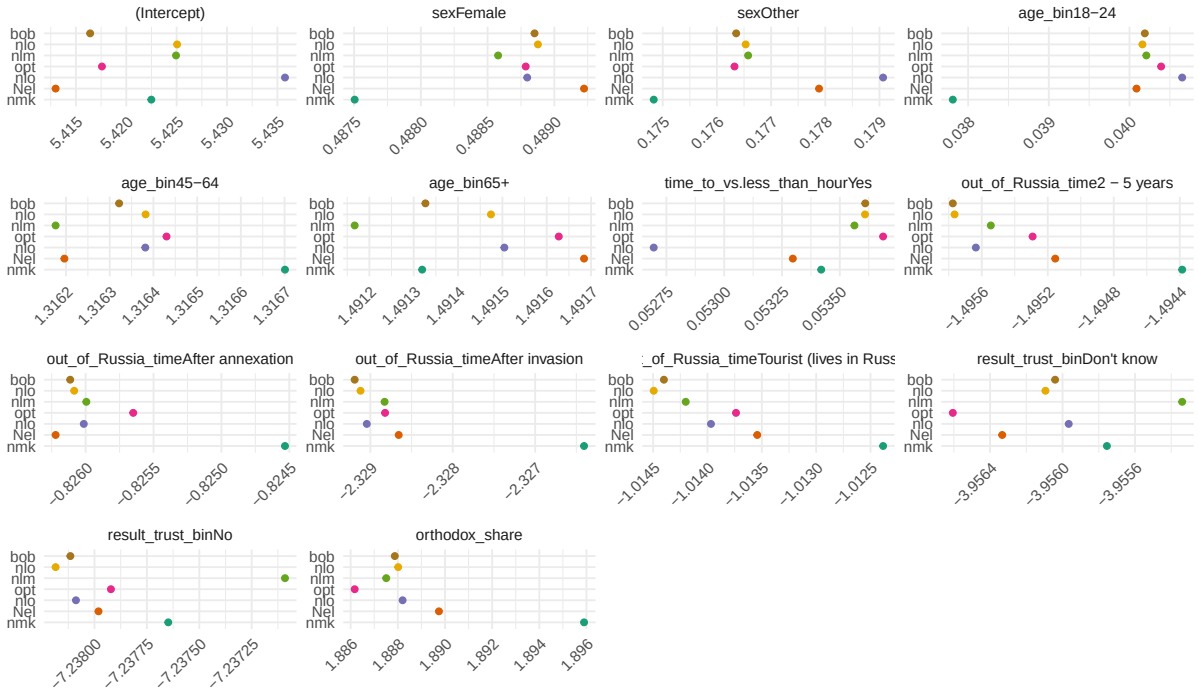
```
$bobyqa
[1] "Model failed to converge with max|grad| = 0.00486188 (tol = 0.002, component 1)"

$Nelder_Mead
[1] "Model failed to converge with max|grad| = 0.0439094 (tol = 0.002, component 1)"

$nlminbwrap
[1] "Model failed to converge with max|grad| = 0.0198981 (tol = 0.002, component 1)"

$nmkbw
[1] "Model failed to converge with max|grad| = 0.0321358 (tol = 0.002, component 1)"

$`optimx.L-BFGS-B`
[1] "Model failed to converge with max|grad| = 0.0818325 (tol = 0.002, component 1)"

$nloptwrap.NLOPT_LN_NELDERMEAD
[1] "Model failed to converge with max|grad| = 0.0240685 (tol = 0.002, component 1)"

$nloptwrap.NLOPT_LN_BOBYQA
[1] "Model failed to converge with max|grad| = 0.0277748 (tol = 0.002, component 1)"
```

```
(lliks <- sort(sapply(m5p.allfit.OK,logLik)))
```

```
                      nmkbw                Nelder_Mead
                  -3178.424                  -3178.423
nloptwrap.NLOPT_LN_BOBYQA              optimx.L-BFGS-B
```

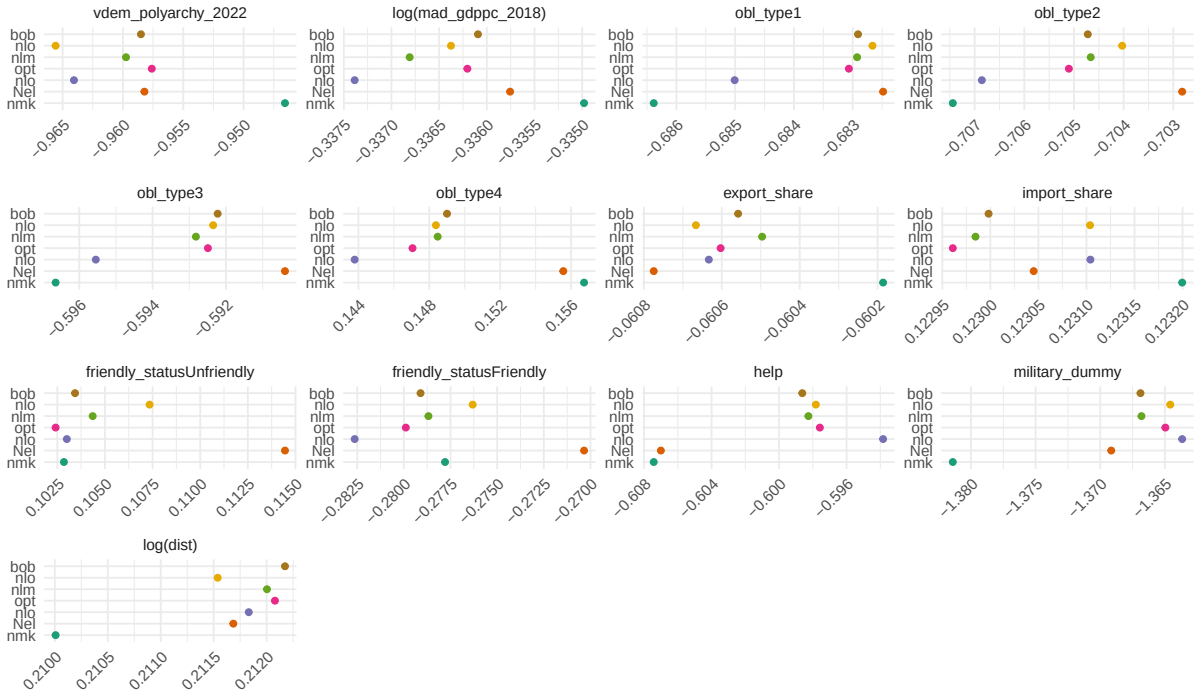
```
-3178.423                       -3178.423
nlminbwrap nloptwrap.NLOPT_LN_NELDERMEAD
-3178.423                       -3178.423
   bobyqa
-3178.423
```

```
m5p.allfit.fixef <- t(sapply(m5p.allfit.OK,fixef))
m5p.allfit.fixef.m <- melt(m5p.allfit.fixef)
models <- levels(m5p.allfit.fixef.m$Var1)
m5p.allfit.fixef.m <- transform(m5p.allfit.fixef.m, Var1 = factor(Var1, levels = names(lliks)))

ggplot(m5p.allfit.fixef.m[1:98, ],
       aes(x = value, y = Var1, colour = Var1)) +
  geom_point() +
  facet_wrap(~ Var2, scale = "free") +
  scale_colour_brewer(palette = "Dark2") +
  scale_y_discrete(breaks = models,
                   labels = substr(models, 1, 3)) +
  labs(x = "", y = "") +
  theme_minimal() +
  theme(legend.position = "none",
        axis.text.x = element_text(angle = 45, hjust = 1))
```




```
ggplot(m5p.allfit.fixef.m[99:189, ],
       aes(x = value, y = Var1, colour = Var1)) +
  geom_point() +
  facet_wrap(~ Var2, scale = "free") +
  scale_colour_brewer(palette = "Dark2") +
```

```
  scale_y_discrete(breaks = models,
                   labels = substr(models, 1, 3)) +
  labs(x = "", y = "") +
  theme_minimal() +
  theme(legend.position = "none",
        axis.text.x = element_text(angle = 45, hjust = 1))
```



Non-systemic v systemic opposition

```
# Non-systemic - Davankov or Spoiled (1) vs systemic - Haritonov, Slutsky (0)
# opposition, declined to answer and Putin are NA
m4s.nested <- glmer(nonsys_sys ~ sex + age_bin + time_to_vs.less_than_hour
                    + out_of_Russia_time + result_trust_bin
                    + (1 | countryname_en.x),
                    data = nested_me_data, family = binomial,
                    control = glmerControl(optimizer = "bobyqa"))

summary(m4s.nested)


m5s.nested <- glmer(nonsys_sys ~ sex + age_bin + time_to_vs.less_than_hour
                    + out_of_Russia_time + result_trust_bin
                    + orthodox_share + vdem_polyarchy_2022
                    + log(mad_gdppc_2018) + obl_type + export_share
                    + import_share + friendly_status  + help + military_dummy
                    + log(dist) + (1 | countryname_en.x),
                    data = nested_me_data, family = binomial,
```

```
                    control = glmerControl(optimizer = "bobyqa",
                                           optCtrl = list(maxfun = 1e9)))

# Singular fit!

# The predictors most likely to cause issues are obl_type and friendly_status
# as they are broadly (and correlated between themselves and other variables)
# defined dichotomous predictors. Remove them from the model and try again


m5s.red <- update(m5s.nested, ~ . - obl_type - friendly_status)

# Works great and no issues with convergence either
```

Davankov v spoiled

```
# Davankov (1) vs Spoiled (0) declined to answer, Haritonov, Slutsky and Putin
# are NA
m4d.nested <- glmer(davankov_spoiled ~ sex + age_bin + time_to_vs.less_than_hour
                    + out_of_Russia_time + result_trust_bin
                    + (1 | countryname_en.x),
                    data = nested_me_data, family = binomial,
                    control = glmerControl(optimizer = "bobyqa"))

summary(m4d.nested)


m5d.nested <- glmer(davankov_spoiled ~ sex + age_bin + time_to_vs.less_than_hour
                    + out_of_Russia_time + result_trust_bin
                    + orthodox_share + vdem_polyarchy_2022
                    + log(mad_gdppc_2018) + obl_type + export_share
                    + import_share + friendly_status  + help + military_dummy
                    + log(dist) + (1 | countryname_en.x),
                    data = nested_me_data, family = binomial,
                    control = glmerControl(optimizer = "bobyqa",
                                           optCtrl = list(maxfun = 1e9)))


derivs1 <- m5d.nested@optinfo$derivs
sc_grad1 <- with(derivs1,solve(Hessian,gradient))
max(abs(sc_grad1))
```

```
[1] 0.004068683
```

```
max(pmin(abs(sc_grad1),abs(derivs1$gradient)))
```

```
[1] 0.004068683
```

```
dd <- update(m5d.nested, devFunOnly=TRUE)
pars <- unlist(getME(m5d.nested,c("theta", "fixef")))
grad2 <- grad(dd,pars)
hess2 <- hessian(dd,pars)
sc_grad2 <- solve(hess2, grad2)
max(pmin(abs(sc_grad2), abs(grad2)))
```

```
[1] 0.003948733
```

```
# Fit with all optimizers (loaded with other models)
# m5d.allfit <- allFit(m5d.nested, maxfun = 1e9)

# No options seem to work
m5d.allfit_OK <- m5d.allfit[sapply(m5d.allfit, is, "merMod")]
lapply(m5d.allfit_OK, function(x) x@optinfo$conv$lme4$messages)
```

```
$bobyqa
[1] "Model failed to converge with max|grad| = 0.0157886 (tol = 0.002, component 1)"

$Nelder_Mead
[1] "Model failed to converge with max|grad| = 0.425244 (tol = 0.002, component 1)"

$nlminbwrap
[1] "Model failed to converge with max|grad| = 1.66793 (tol = 0.002, component 1)"

$`optimx.L-BFGS-B`
[1] "Model failed to converge with max|grad| = 0.0682182 (tol = 0.002, component 1)"

$nloptwrap.NLOPT_LN_NELDERMEAD
[1] "Model failed to converge with max|grad| = 0.081166 (tol = 0.002, component 1)"

$nloptwrap.NLOPT_LN_BOBYQA
[1] "Model failed to converge with max|grad| = 0.0678025 (tol = 0.002, component 1)"
```

```
# Check for singular fit
tt <- getME(m5d.nested,"theta")
ll <- getME(m5d.nested,"lower")
min(tt[ll==0]) # Nope, no singular fit
```

```
[1] 0.112515
```

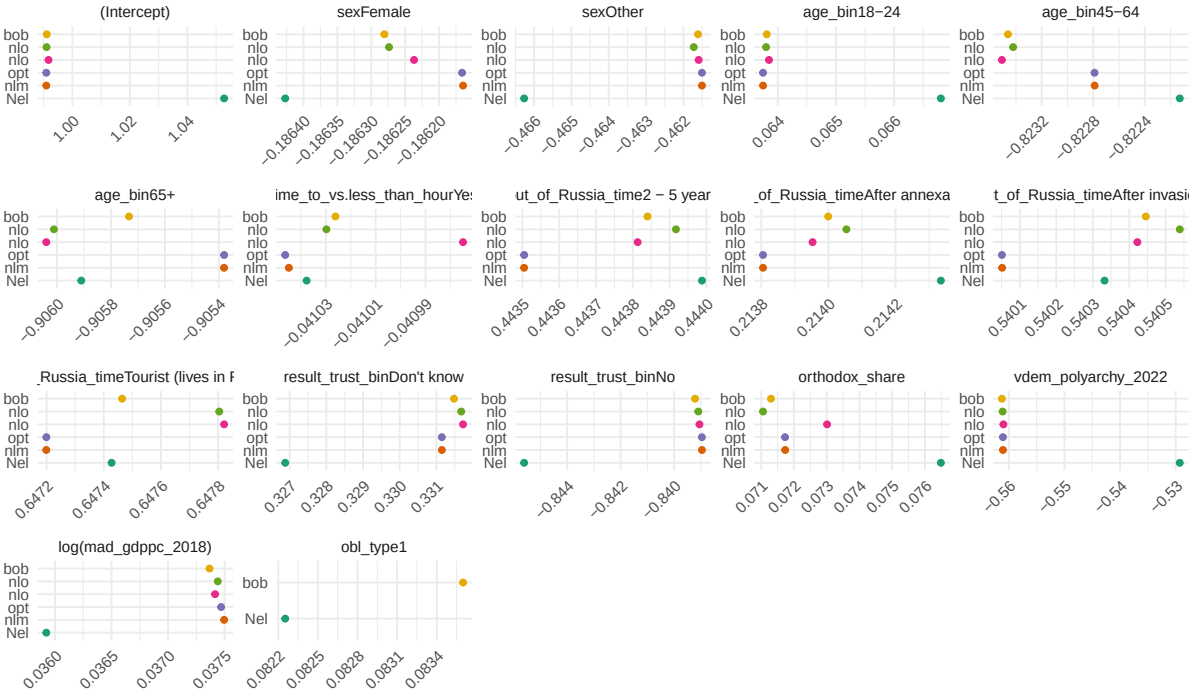
```
# The only other thing to try is to see whether the coefficients change in
# unconverged models
is.OK <- sapply(m5d.allfit, is, "merMod")
m5d.allfit.OK <- m5d.allfit[is.OK]
lapply(m5d.allfit.OK,function(x) x@optinfo$conv$lme4$messages)
```

```
$bobyqa
[1] "Model failed to converge with max|grad| = 0.0157886 (tol = 0.002, component 1)"

$Nelder_Mead
[1] "Model failed to converge with max|grad| = 0.425244 (tol = 0.002, component 1)"

$nlminbwrap
[1] "Model failed to converge with max|grad| = 1.66793 (tol = 0.002, component 1)"

$`optimx.L-BFGS-B`
[1] "Model failed to converge with max|grad| = 0.0682182 (tol = 0.002, component 1)"

$nloptwrap.NLOPT_LN_NELDERMEAD
[1] "Model failed to converge with max|grad| = 0.081166 (tol = 0.002, component 1)"

$nloptwrap.NLOPT_LN_BOBYQA
[1] "Model failed to converge with max|grad| = 0.0678025 (tol = 0.002, component 1)"
```

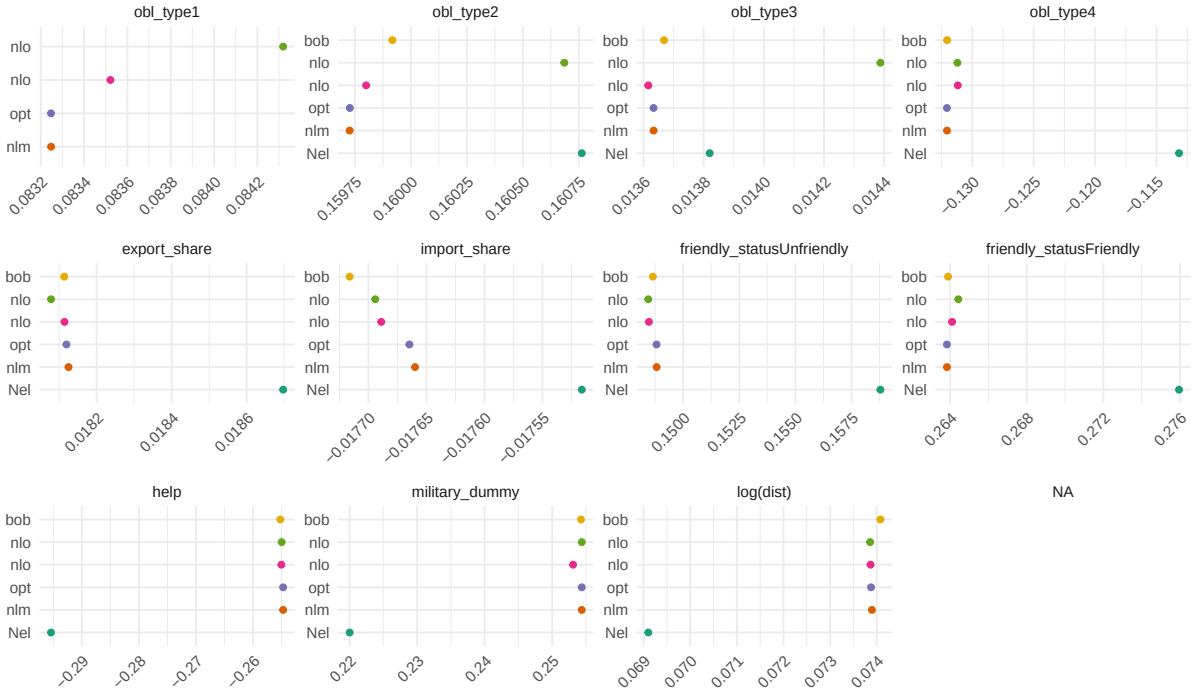
```
(lliks <- sort(sapply(m5d.allfit.OK,logLik)))
```

```
                  Nelder_Mead                     nlminbwrap
                    -20537.76                     -20537.73
               optimx.L-BFGS-B    nloptwrap.NLOPT_LN_BOBYQA
                    -20537.73                     -20537.73
nloptwrap.NLOPT_LN_NELDERMEAD                        bobyqa
                    -20537.73                     -20537.73
```

```
m5d.allfit.fixef <- t(sapply(m5d.allfit.OK,fixef))
m5d.allfit.fixef.m <- melt(m5d.allfit.fixef)
models <- levels(m5d.allfit.fixef.m$Var1)
m5d.allfit.fixef.m <- transform(m5d.allfit.fixef.m,
                            Var1 = factor(Var1, levels = names(lliks)))

ggplot(m5d.allfit.fixef.m[1:98, ],
       aes(x = value, y = Var1, colour = Var1)) +
  geom_point() +
  facet_wrap(~ Var2, scale = "free") +
  scale_colour_brewer(palette = "Dark2") +
  scale_y_discrete(breaks = models,
                   labels = substr(models, 1, 3)) +
  labs(x = "", y = "") +
  theme_minimal() +
  theme(legend.position = "none",
        axis.text.x = element_text(angle = 45, hjust = 1))
```




```
ggplot(m5d.allfit.fixef.m[99:189, ],
       aes(x = value, y = Var1, colour = Var1)) +
  geom_point() +
  facet_wrap(~ Var2, scale = "free") +
  scale_colour_brewer(palette = "Dark2") +
  scale_y_discrete(breaks = models,
                   labels = substr(models, 1, 3)) +
  labs(x = "", y = "") +
  theme_minimal() +
  theme(legend.position = "none",
        axis.text.x = element_text(angle = 45, hjust = 1))
```




```
save(list = c("m5a.nested", "m5p.nested", "m5s.nested", "m5s.red", "m5d.nested"),
     file = "nlme_bobyqa.RData")

save(list = c("m4a.nested", "m4p.nested", "m4s.nested", "m4d.nested"),
     file = "feme_bobyqa.RData")

save(list = c("m5a.allfit", "m5p.allfit", "m5d.allfit"),
     file = "me_allfit.RData")


resizebox.stargazer(m4a.nested, m4p.nested, m4s.nested, m4d.nested,
          title = "Mixed effects models, level 1", header = F,
          dep.var.labels = c("Declined to answer vs answer",
                             "Putin vs everyone else",
                             "Non-systemic vs systemic opposition",
                             "Davankov vs Spoiled"),
          tab.height = "\\textheight", tab.width= "\\textwidth")



m3.answer <- models(m3.nested.fe, 1)
m3.putin <- models(m3.nested.fe, 2)
m3.nonsys <- models(m3.nested.fe, 3)
m3.davankov <- models(m3.nested.fe, 4)


resizebox.stargazer(m4a.nested, m3.answer, m4p.nested, m3.putin,
          title = "Mixed effects models, comparison I", header = F,
          omit = "as.factor",
          dep.var.labels = c("Declined to answer vs answer",
                             "Declined to answer vs answer",
                             "Putin vs everyone else",
```

Table 6: Mixed effects models, level 1

	Dependent variable:			
	Declined to answer vs answer	Putin vs everyone else	Non-systemic vs systemic opposition	Davankov vs Spoiled
	(1)	(2)	(3)	(4)
sexFemale	0.275***	0.482***	0.022	−0.199***
	(0.044)	(0.071)	(0.056)	(0.024)
sexOther	0.064	0.171	−0.375	−0.470***
	(0.237)	(0.368)	(0.296)	(0.144)
age_bin18-24	−0.003	0.026	−0.095	0.062*
	(0.081)	(0.124)	(0.086)	(0.037)
age_bin45-64	0.180***	1.322***	−0.302***	−0.826***
	(0.059)	(0.086)	(0.087)	(0.039)
age_bin65+	0.170**	1.507***	−0.957***	−0.931***
	(0.077)	(0.131)	(0.155)	(0.106)
time_to_vs.less_than_hourYes	0.376***	0.094	−0.099	−0.034
	(0.052)	(0.081)	(0.061)	(0.026)
out_of_Russia_time2 - 5 years	−0.207***	−1.480***	0.409***	0.454***
	(0.075)	(0.109)	(0.091)	(0.042)
out_of_Russia_timeAfter annexation	−0.159**	−0.806***	0.296***	0.219***
	(0.080)	(0.120)	(0.102)	(0.045)
out_of_Russia_timeAfter invasion	−0.359***	−2.330***	0.766***	0.565***
	(0.069)	(0.101)	(0.084)	(0.040)
out_of_Russia_timeTourist (lives in Russia)	−0.039	−0.975***	0.041	0.652***
	(0.096)	(0.143)	(0.144)	(0.087)
result_trust_binDon't know	0.499***	−3.960***	0.718***	0.387***
	(0.082)	(0.109)	(0.127)	(0.139)
result_trust_binNo	−1.328***	−7.218***	1.903***	−0.806***
	(0.060)	(0.101)	(0.094)	(0.105)
Constant	−2.658***	1.992***	1.267***	1.558***
	(0.123)	(0.158)	(0.123)	(0.117)
Observations	53,824	51,202	42,363	40,946
Log Likelihood	−9,143.189	−3,369.086	−5,864.162	−22,658.160
Akaike Inf. Crit.	18,314.380	6,766.172	11,756.320	45,344.320
Bayesian Inf. Crit.	18,438.890	6,889.982	11,877.480	45,465.000

Note: *p<0.1; **p<0.05; ***p<0.01

```
                        "Putin vs everyone else"
                        ),
          tab.height = "\\textheight", tab.width= "\\textwidth")
```

Table 7: Mixed effects models, comparison I

	Dependent variable:			
	Declined to answer vs answer	Declined to answer vs answer	Putin vs everyone else	Putin vs everyone else
	generalized linear mixed-effects	*logistic*	*generalized linear mixed-effects*	*logistic*
	(1)	(2)	(3)	(4)
sexFemale	0.275***	0.275***	0.482***	0.481***
	(0.044)	(0.044)	(0.071)	(0.072)
sexOther	0.064	0.039	0.171	0.208
	(0.237)	(0.240)	(0.368)	(0.369)
age_bin18-24	−0.003	−0.008	0.026	0.019
	(0.081)	(0.082)	(0.124)	(0.126)
age_bin45-64	0.180***	0.172***	1.322***	1.304***
	(0.059)	(0.059)	(0.086)	(0.087)
age_bin65+	0.170**	0.161**	1.507***	1.501***
	(0.077)	(0.078)	(0.131)	(0.132)
time_to_vs.less_than_hourYes	0.376***	0.310***	0.094	0.071
	(0.052)	(0.055)	(0.081)	(0.085)
out_of_Russia_time2 - 5 years	−0.207***	−0.217***	−1.480***	−1.467***
	(0.075)	(0.075)	(0.109)	(0.110)
out_of_Russia_timeAfter annexation	−0.159**	−0.179**	−0.806***	−0.798***
	(0.080)	(0.081)	(0.120)	(0.121)
out_of_Russia_timeAfter invasion	−0.359***	−0.363***	−2.330***	−2.357***
	(0.069)	(0.069)	(0.101)	(0.103)
out_of_Russia_timeTourist (lives in Russia)	−0.039	−0.002	−0.975***	−0.997***
	(0.096)	(0.098)	(0.143)	(0.146)
result_trust_binDon't know	0.499***	0.521***	−3.960***	−3.955***
	(0.082)	(0.083)	(0.109)	(0.110)
result_trust_binNo	−1.328***	−1.293***	−7.218***	−7.204***
	(0.060)	(0.060)	(0.101)	(0.102)
Constant	−2.658***	−2.146***	1.992***	1.379***
	(0.123)	(0.144)	(0.158)	(0.247)
Observations	53,824	53,824	51,202	51,202
Log Likelihood	−9,143.189	−9,008.215	−3,369.086	−3,287.206
Akaike Inf. Crit.	18,314.380	18,166.430	6,766.172	6,724.412
Bayesian Inf. Crit.	18,438.890		6,889.982	
Note:				*p<0.1; **p<0.05; ***p<0.01

```
resizebox.stargazer(m4s.nested, m3.nonsys, m4d.nested, m3.davankov,
          title = "Mixed effects models, comparison II", header = F,
          omit = "as.factor",
          dep.var.labels = c("Non-systemic vs systemic opposition",
                             "Non-systemic vs systemic opposition",
                             "Davankov vs Spoiled",
                             "Davankov vs Spoiled"
                             ),
```

```
          tab.height = "\\textheight", tab.width= "\\textwidth")
```

Table 8: Mixed effects models, comparison II

	Dependent variable:			
	Non-systemic vs systemic opposition	Non-systemic vs systemic opposition	Davankov vs Spoiled	Davankov vs Spoiled
	generalized linear mixed-effects	*logistic*	*generalized linear mixed-effects*	*logistic*
	(1)	(2)	(3)	(4)
sexFemale	0.022	0.019	−0.199***	−0.195***
	(0.056)	(0.057)	(0.024)	(0.024)
sexOther	−0.375	−0.371	−0.470***	−0.455***
	(0.296)	(0.301)	(0.144)	(0.146)
age_bin18-24	−0.095	−0.114	0.062*	0.072*
	(0.086)	(0.088)	(0.037)	(0.037)
age_bin45-64	−0.302***	−0.294***	−0.826***	−0.827***
	(0.087)	(0.088)	(0.039)	(0.039)
age_bin65+	−0.957***	−0.994***	−0.931***	−0.952***
	(0.155)	(0.159)	(0.106)	(0.107)
time_to_vs.less_than_hourYes	−0.099	−0.086	−0.034	−0.028
	(0.061)	(0.067)	(0.026)	(0.027)
out_of_Russia_time2 - 5 years	0.409***	0.419***	0.454***	0.438***
	(0.091)	(0.093)	(0.042)	(0.042)
out_of_Russia_timeAfter annexation	0.296***	0.299***	0.219***	0.213***
	(0.102)	(0.103)	(0.045)	(0.046)
out_of_Russia_timeAfter invasion	0.766***	0.820***	0.565***	0.539***
	(0.084)	(0.090)	(0.040)	(0.040)
out_of_Russia_timeTourist (lives in Russia)	0.041	0.134	0.652***	0.633***
	(0.144)	(0.150)	(0.087)	(0.088)
result_trust_binDon't know	0.718***	0.716***	0.387***	0.392***
	(0.127)	(0.129)	(0.139)	(0.141)
result_trust_binNo	1.903***	1.891***	−0.806***	−0.804***
	(0.094)	(0.095)	(0.105)	(0.106)
Constant	1.267***	1.223***	1.558***	1.401***
	(0.123)	(0.198)	(0.117)	(0.130)
Observations	42,363	42,363	40,946	40,946
Log Likelihood	−5,864.162	−5,809.709	−22,658.160	−22,553.850
Akaike Inf. Crit.	11,756.320	11,769.420	45,344.320	45,257.690
Bayesian Inf. Crit.	11,877.480		45,465.000	
Note:				*p<0.1; **p<0.05; ***p<0.01

```
resizebox.stargazer(m5a.nested, m5p.nested, m5s.red, m5d.nested,
          title = "Mixed effects models with level 2", header = F,
          omit = "as.factor",
          dep.var.labels = c("Declined to answer vs answer",
                             "Putin vs everyone else",
                             "Non-systemic vs systemic opposition",
                             "Davankov vs Spoiled"
                             ),
          tab.height = "\\textheight", tab.width= "\\textwidth")
```

Table 9: Mixed effects models with level 2

	Dependent variable:			
	Declined to answer vs answer	Putin vs everyone else	Non-systemic vs systemic opposition	Davankov vs Spoiled
	(1)	(2)	(3)	(4)
sexFemale	0.258***	0.489***	0.015	−0.186***
	(0.045)	(0.073)	(0.059)	(0.025)
sexOther	0.071	0.176	−0.232	−0.462***
	(0.240)	(0.376)	(0.328)	(0.148)
age_bin18-24	0.036	0.040	−0.117	0.064*
	(0.083)	(0.125)	(0.088)	(0.038)
age_bin45-64	0.194***	1.316***	−0.299***	−0.823***
	(0.060)	(0.089)	(0.090)	(0.040)
age_bin65+	0.175**	1.491***	−0.930***	−0.906***
	(0.078)	(0.134)	(0.159)	(0.108)
time_to_vs.less_than_hourYes	0.355***	0.054	−0.081	−0.041
	(0.054)	(0.084)	(0.065)	(0.027)
out_of_Russia_time2 - 5 years	−0.175**	−1.496***	0.402***	0.444***
	(0.076)	(0.111)	(0.093)	(0.042)
out_of_Russia_timeAfter annexation	−0.134*	−0.826***	0.318***	0.214***
	(0.081)	(0.121)	(0.103)	(0.045)
out_of_Russia_timeAfter invasion	−0.351***	−2.329***	0.817***	0.540***
	(0.071)	(0.103)	(0.090)	(0.040)
out_of_Russia_timeTourist (lives in Russia)	−0.018	−1.014***	0.148	0.647***
	(0.099)	(0.148)	(0.153)	(0.090)
result_trust_binDon't know	0.551***	−3.956***	0.700***	0.331**
	(0.084)	(0.111)	(0.133)	(0.146)
result_trust_binNo	−1.355***	−7.238***	1.910***	−0.839***
	(0.062)	(0.103)	(0.098)	(0.111)
orthodox_share	−0.472	1.888***	−0.360**	0.071
	(0.468)	(0.412)	(0.142)	(0.163)
vdem_polyarchy_2022	0.328	−0.959	0.532**	−0.561**
	(0.668)	(0.674)	(0.250)	(0.233)
log(mad_gdppc_2018)	−0.280	−0.336*	0.036	0.037
	(0.174)	(0.176)	(0.088)	(0.072)
obl_type1	−0.412	−0.683		0.084
	(0.471)	(0.454)		(0.162)
obl_type2	−0.900*	−0.705		0.160
	(0.507)	(0.485)		(0.171)
obl_type3	−0.653	−0.592		0.014
	(0.463)	(0.427)		(0.162)
obl_type4	−0.826	0.149		−0.132
	(0.814)	(0.739)		(0.278)
export_share	−0.174***	−0.061	0.030	0.018
	(0.062)	(0.058)	(0.024)	(0.016)
import_share	0.217***	0.123**	−0.020	−0.018
	(0.063)	(0.056)	(0.020)	(0.018)
friendly_statusUnfriendly	0.622	0.103		0.149
	(0.819)	(0.794)		(0.284)
friendly_statusFriendly	0.430	−0.279		0.264
	(0.480)	(0.466)		(0.183)
help	−1.003**	−0.599	−0.124	−0.255
	(0.476)	(0.532)	(0.194)	(0.196)
military_dummy	0.085	−1.367**	0.224	0.254
	(0.728)	(0.678)	(0.195)	(0.264)
log(dist)	−0.386**	0.212	−0.150***	0.074
	(0.151)	(0.144)	(0.057)	(0.050)
Constant	3.842*	5.416***	1.739*	0.991
	(1.965)	(2.091)	(1.051)	(0.907)
Observations	48,964	46,494	37,827	36,523
Log Likelihood	−8,472.302	−3,178.423	−5,342.410	−20,537.730
Akaike Inf. Crit.	17,000.600	6,412.846	10,728.820	41,131.460
Bayesian Inf. Crit.	17,246.970	6,657.764	10,916.720	41,369.610

Note: *p<0.1; **p<0.05; ***p<0.01

```
resizebox.stargazer(m4a.nested, m5a.nested, m4p.nested, m5p.nested,
          title = "Mixed effects models with level 2, comparison I", header = F,
          omit = "as.factor",
          dep.var.labels = c("Declined to answer vs answer",
                             "Declined to answer vs answer",
                             "Putin vs everyone else",
                             "Putin vs everyone else"
                             ),
          tab.height = "\\textheight", tab.width= "\\textwidth")


resizebox.stargazer(m4s.nested, m5s.red, m4d.nested, m5d.nested,
          title = "Mixed effects models with level 2, comparison II", header = F,
          omit = "as.factor",
          dep.var.labels = c("Non-systemic vs systemic opposition",
                             "Non-systemic vs systemic opposition",
                             "Davankov vs Spoiled",
                             "Davankov vs Spoiled"
                             ),
          tab.height = "\\textheight", tab.width= "\\textwidth")
```

Table 10: Mixed effects models with level 2, comparison I

	Dependent variable:			
	Declined to answer vs answer		Declined to answer vs answer	
	(1)	(2)	(3)	(4)
sexFemale	0.275***	0.258***	0.482***	0.489***
	(0.044)	(0.045)	(0.071)	(0.073)
sexOther	0.064	0.071	0.171	0.176
	(0.237)	(0.240)	(0.368)	(0.376)
age_bin18-24	−0.003	0.036	0.026	0.040
	(0.081)	(0.083)	(0.124)	(0.125)
age_bin45-64	0.180***	0.194***	1.322***	1.316***
	(0.059)	(0.060)	(0.086)	(0.089)
age_bin65+	0.170**	0.175**	1.507***	1.491***
	(0.077)	(0.078)	(0.131)	(0.134)
time_to_vs.less_than_hourYes	0.376***	0.355***	0.094	0.054
	(0.052)	(0.054)	(0.081)	(0.084)
out_of_Russia_time2 - 5 years	−0.207***	−0.175**	−1.480***	−1.496***
	(0.075)	(0.076)	(0.109)	(0.111)
out_of_Russia_timeAfter annexation	−0.159**	−0.134*	−0.806***	−0.826***
	(0.080)	(0.081)	(0.120)	(0.121)
out_of_Russia_timeAfter invasion	−0.359***	−0.351***	−2.330***	−2.329***
	(0.069)	(0.071)	(0.101)	(0.103)
out_of_Russia_timeTourist (lives in Russia)	−0.039	−0.018	−0.975***	−1.014***
	(0.096)	(0.099)	(0.143)	(0.148)
result_trust_binDon't know	0.499***	0.551***	−3.960***	−3.956***
	(0.082)	(0.084)	(0.109)	(0.111)
result_trust_binNo	−1.328***	−1.355***	−7.218***	−7.238***
	(0.060)	(0.062)	(0.101)	(0.103)
orthodox_share		−0.472		1.888***
		(0.468)		(0.412)
vdem_polyarchy_2022		0.328		−0.959
		(0.668)		(0.674)
log(mad_gdppc_2018)		−0.280		−0.336*
		(0.174)		(0.176)
obl_type1		−0.412		−0.683
		(0.471)		(0.454)
obl_type2		−0.900*		−0.705
		(0.507)		(0.485)
obl_type3		−0.653		−0.592
		(0.463)		(0.427)
obl_type4		−0.826		0.149
		(0.814)		(0.739)
export_share		−0.174***		−0.061
		(0.062)		(0.058)
import_share		0.217***		0.123**
		(0.063)		(0.056)
friendly_statusUnfriendly		0.622		0.103
		(0.819)		(0.794)
friendly_statusFriendly		0.430		−0.279
		(0.480)		(0.466)
help		−1.003**		−0.599
		(0.476)		(0.532)
military_dummy		0.085		−1.367**
		(0.728)		(0.678)
log(dist)		−0.386**		0.212
		(0.151)		(0.144)
Constant	−2.658***	3.842*	1.992***	5.416***
	(0.123)	(1.965)	(0.158)	(2.091)
Observations	53,824	48,964	51,202	46,494
Log Likelihood	−9,143.189	−8,472.302	−3,369.086	−3,178.423
Akaike Inf. Crit.	18,314.380	17,000.600	6,766.172	6,412.846
Bayesian Inf. Crit.	18,438.890	17,246.970	6,889.982	6,657.764
Note:				*p<0.1; **p<0.05; ***p<0.01

Table 11: Mixed effects models with level 2, comparison II

	Dependent variable:			
	Non-systemic vs systemic opposition		Non-systemic vs systemic opposition	
	(1)	(2)	(3)	(4)
sexFemale	0.022	0.015	−0.199***	−0.186***
	(0.056)	(0.059)	(0.024)	(0.025)
sexOther	−0.375	−0.232	−0.470***	−0.462***
	(0.296)	(0.328)	(0.144)	(0.148)
age_bin18-24	−0.095	−0.117	0.062*	0.064*
	(0.086)	(0.088)	(0.037)	(0.038)
age_bin45-64	−0.302***	−0.299***	−0.826***	−0.823***
	(0.087)	(0.090)	(0.039)	(0.040)
age_bin65+	−0.957***	−0.930***	−0.931***	−0.906***
	(0.155)	(0.159)	(0.106)	(0.108)
time_to_vs.less_than_hourYes	−0.099	−0.081	−0.034	−0.041
	(0.061)	(0.065)	(0.026)	(0.027)
out_of_Russia_time2 - 5 years	0.409***	0.402***	0.454***	0.444***
	(0.091)	(0.093)	(0.042)	(0.042)
out_of_Russia_timeAfter annexation	0.296***	0.318***	0.219***	0.214***
	(0.102)	(0.103)	(0.045)	(0.045)
out_of_Russia_timeAfter invasion	0.766***	0.817***	0.565***	0.540***
	(0.084)	(0.090)	(0.040)	(0.040)
out_of_Russia_timeTourist (lives in Russia)	0.041	0.148	0.652***	0.647***
	(0.144)	(0.153)	(0.087)	(0.090)
result_trust_binDon't know	0.718***	0.700***	0.387***	0.331**
	(0.127)	(0.133)	(0.139)	(0.146)
result_trust_binNo	1.903***	1.910***	−0.806***	−0.839***
	(0.094)	(0.098)	(0.105)	(0.111)
orthodox_share		−0.360**		0.071
		(0.142)		(0.163)
vdem_polyarchy_2022		0.532**		−0.561**
		(0.250)		(0.233)
log(mad_gdppc_2018)		0.036		0.037
		(0.088)		(0.072)
obl_type1				0.084
				(0.162)
obl_type2				0.160
				(0.171)
obl_type3				0.014
				(0.162)
obl_type4				−0.132
				(0.278)
export_share		0.030		0.018
		(0.024)		(0.016)
import_share		−0.020		−0.018
		(0.020)		(0.018)
friendly_statusUnfriendly				0.149
				(0.284)
friendly_statusFriendly				0.264
				(0.183)
help		−0.124		−0.255
		(0.194)		(0.196)
military_dummy		0.224		0.254
		(0.195)		(0.264)
log(dist)		−0.150***		0.074
		(0.057)		(0.050)
Constant	1.267***	1.739*	1.558***	0.991
	(0.123)	(1.051)	(0.117)	(0.907)
Observations	42,363	37,827	40,946	36,523
Log Likelihood	−5,864.162	−5,342.410	−22,658.160	−20,537.730
Akaike Inf. Crit.	11,756.320	10,728.820	45,344.320	41,131.460
Bayesian Inf. Crit.	11,877.480	10,916.720	45,465.000	41,369.610

Note: *p<0.1; **p<0.05; ***p<0.01