Replikation prac2_mlwin.do

Discrete-time Event History Analysis

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```
options(MLwiN_path = "C:/Program Files (x86)/MLwiN trial/i386/")

library(tidyverse)
```

```
## Loading tidyverse: ggplot2
## Loading tidyverse: tibble
## Loading tidyverse: tidyr
## Loading tidyverse: readr
## Loading tidyverse: purrr
## Loading tidyverse: dplyr
```

```
## Conflicts with tidy packages ----------------------------------------------
```

```
## filter(): dplyr, stats
## lag():    dplyr, stats
```

```
library(haven)
suppressMessages(library(R2MLwiN))
library(modelr)
library(AzureML)

ws <- workspace()

daten <- download.datasets(
  dataset = ws,
  name    = "statafile.csv")

daten <- tbl_df(daten)
```

Modell 1

```
form <- logit(event, cons) ~ tgp2 + tgp3 + tgp4 + tgp5 + tgp6 + tgp7 + tgp8 + tgp9 + tgp10 + cons + (co

runMLwiN(form , D = "Binomial", estoptions = list(EstM = 1, mcmcMeth=list(seed=1, orth=1)),  data = dat
```

```
## MLwiN is running, please wait......
```

```
##
## -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-
## MLwiN (version: 2.36)  multilevel model (Binomial)
##         N min     mean max N_complete min_complete mean_complete
## l2id 1399   1 10.93424  44       1399            1      10.93424
##      max_complete
## l2id           44
## Estimation algorithm:  MCMC      Elapsed time : 205.94s
```

```
## Number of obs:  15297 (from total 15297)          Number of iter.: 5000  Chains: 1  Burn-in: 500
## Bayesian Deviance Information Criterion (DIC)
## Dbar      D(thetabar)    pD      DIC
## 6093.165   5315.991   777.174    6870.339
## ---------------------------------------------------------------------------------------------------
## The model formula:
## logit(event, cons) ~ tgp2 + tgp3 + tgp4 + tgp5 + tgp6 + tgp7 +
##     tgp8 + tgp9 + tgp10 + cons + (cons | l2id)
## Level 2: l2id     Level 1: l1id
## ---------------------------------------------------------------------------------------------------
## The fixed part estimates:
##              Coef.   Std. Err.        z    Pr(>|z|)        [95% Cred.   Interval]   ESS
## tgp2       -0.63709    0.09820   -6.49   8.722e-11  ***    -0.82798    -0.44259   431
## tgp3       -1.05736    0.12462   -8.48   2.163e-17  ***    -1.30748    -0.82183   456
## tgp4       -1.41463    0.15982   -8.85   8.665e-19  ***    -1.74044    -1.09897   467
## tgp5       -1.33905    0.17216   -7.78   7.362e-15  ***    -1.69678    -1.01269   407
## tgp6       -1.20107    0.19282   -6.23   4.698e-10  ***    -1.58346    -0.83114   569
## tgp7       -1.25031    0.20932   -5.97   2.327e-09  ***    -1.65863    -0.85166   515
## tgp8       -1.45386    0.24661   -5.90   3.737e-09  ***    -1.95139    -0.98675   429
## tgp9       -1.54749    0.26578   -5.82   5.801e-09  ***    -2.07598    -1.04551   583
## tgp10      -2.08020    0.16607  -12.53   5.392e-36  ***    -2.40934    -1.77513   139
## cons       -1.35945    0.08896  -15.28   1.026e-52  ***    -1.55128    -1.19496   103
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## ---------------------------------------------------------------------------------------------------
## The random part estimates at the l2id level:
##              Coef.   Std. Err.   [95% Cred.   Interval]   ESS
## var_cons   2.99902     0.35094      2.34811     3.74939    84
## ---------------------------------------------------------------------------------------------------
## The random part estimates at the l1id level:
##                 Coef.   Std. Err.   [95% Cred.   Interval]    ESS
## var_bcons_1   1.00000       1e-05      1.00000     1.00000   5000
## -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-
```

Ansicht in MLWIN

$\text{event}_{ij} \sim \text{Binomial}(\text{cons}_{ij}, \pi_{ij})$

$\text{logit}(\pi_{ij}) = -0.637(0.098)\text{tgp2}_{ij} + -1.057(0.125)\text{tgp3}_{ij} + -1.415(0.160)\text{tgp4}_{ij} + -1.339(0.172)\text{tgp5}_{ij} + -1.201(0.193)\text{tgp6}_{ij} +$
$\quad -1.250(0.209)\text{tgp7}_{ij} + -1.454(0.247)\text{tgp8}_{ij} + -1.547(0.266)\text{tgp9}_{ij} + -2.080(0.166)\text{tgp10}_{ij} + \beta_{9j}\text{cons}$

$\beta_{9j} = -1.359(0.089) + u_{9j}$

$\left[u_{9j}\right] \sim \text{N}(0, \Omega_u) \ : \ \Omega_u = \left[2.999(0.351)\right]$

$\text{var}(\text{event}_{ij}|\pi_{ij}) = \pi_{ij}(1 - \pi_{ij})/\text{cons}_{ij}$

PRIOR SPECIFICATIONS

$p(\beta_0) \propto 1$

$p(\beta_1) \propto 1$

$p(\beta_2) \propto 1$

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$p(\beta_4) \propto 1$

$p(\beta_5) \propto 1$

$p(\beta_6) \propto 1$

$p(\beta_7) \propto 1$

$p(\beta_8) \propto 1$

$p(\beta_9) \propto 1$

$p(1/\sigma^2_{u9}) \sim \text{Gamma}(0.001,0.001)$

Deviance(MCMC) = 6093.165(15297 of 15297 cases in use)

Stata-Syntax

```
*Fit random effects logit model with tgp=1 as the reference

*MQL1 estimates (to get starting values for MCMC)
*These are only approximate for multilevel models.
*It is strongly recommended that you use MCMC.

runmlwin event ///
  tgp2-tgp10 cons, ///
  level2(l2id: cons) ///
  level1(l1id:) ///
  discrete(distribution(binomial) link(logit) denom(cons)) maxi(50) nopause

*Now estimate the model using MCMC. We specify a burn-in of 500 and chain length of 5000 (but in practi
                                                                                    *will be requ
*The 'orth' and 'parexpansion' options specify the use of orthogonal fixed effects and
*parameter expansion to improve efficiency of MCMC sampling.
*See Chapters 24 of the 'MCMC Estimation in MLwiN' User Guide at http://www.bristol.ac.uk/cmm/software/
*A random number seed is used to ensure we get the same results each time the model is re-run.

runmlwin event ///
  tgp2-tgp10 cons, ///
  level2(l2id: cons, parexpansion) ///
  level1(l1id:) ///
  discrete(distribution(binomial) link(logit) denom(cons)) ///
```

```
  mcmc(burnin(500) chain(5000) orth seed(1)) initsprevious pause
```

Modell 2 & Parameteränderungen

```
form2 <- logit(event, cons) ~
  tgp2   + tgp3   + tgp4   + tgp5   + tgp6   + tgp7   + tgp8   + tgp9   + tgp10 +
  agegp1 + agegp2 + agegp3 + agegp4 + agegp5 + agegp6 + agegp7 + agegp8 + everjob +
  cons   + (cons | l2id)
```

```
eins <- list(EstM = 1, mcmcMeth=list(seed=1, orth=1))

zwei <- list(EstM = 0,
             mcmcMeth  = list(seed=1),
             nonlinear = c(N = 0 , M = 1))

drei <- list(EstM        = 1,
             mcmcMeth    = list(seed=1),
             Meth        = 1,
             nonlinear   = c(N = 0 , M = 1),
             mcmcOptions = list(paex = c(2, 1), orth = 1))


# runMLwiN(form2 , D = "Binomial", estoptions = eins, data = daten)

# runMLwiN(form2 , D = "Binomial", estoptions = zwei, data = daten)
```