Running MLwiN from within Stata: the `runmlwin` command

Research Workshop in Multilevel Modelling using MLwiN
Bristol
13th September 2013

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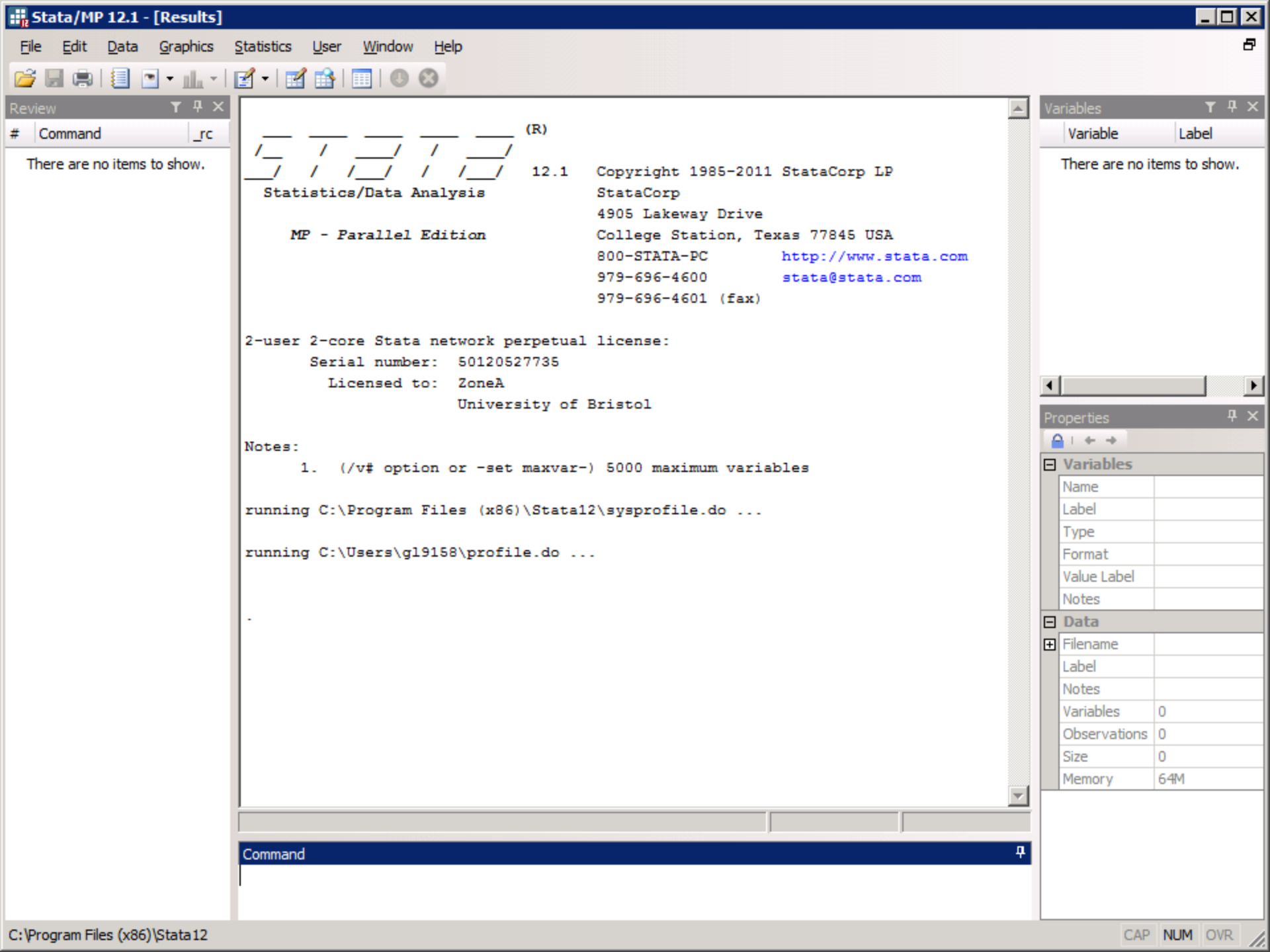
Centre for Multilevel Modelling
University of Bristol

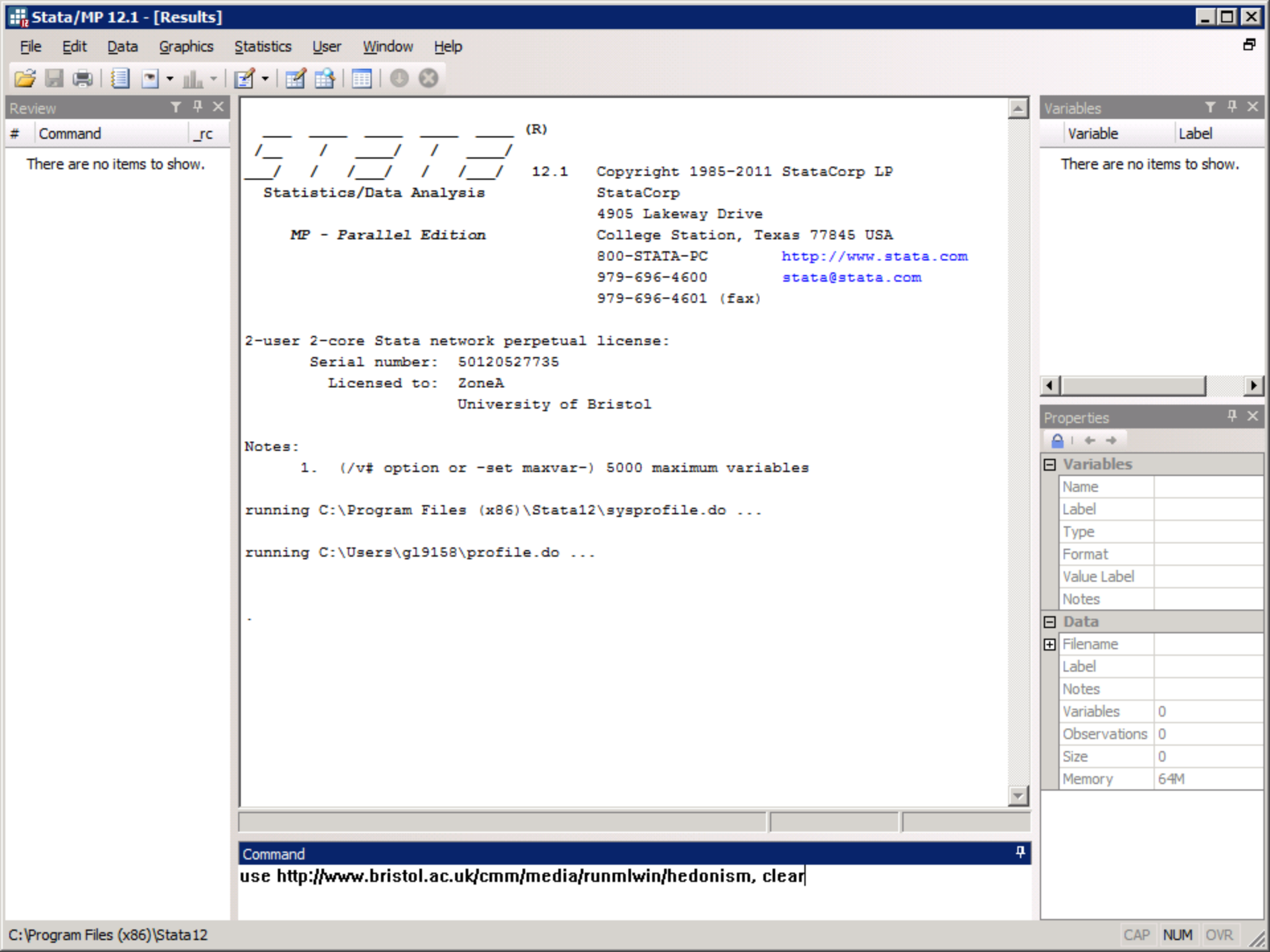
What is `runmlwin`?

- `runmlwin` is a Stata command to run MLwiN seamlessly from within Stata
  - MLwiN offers fast estimation for a wide range of multilevel models, but has limited data management, graphics and programming facilities
  - Stata offers a limited range of multilevel models, but has excellent facilities for pre- and post-estimation data management and graphics and many model testing and interpretation routines
  - `runmlwin` capitalises on the best features of both packages

- But what if you use R rather than Stata…
  - Then use the `r2mlwin` R function to run MLwiN from within R
  - `r2mlwin` provides all the same functionality as `runmlwin`

1. EXAMPLE ANALYSES USING THE HEDONISM IN EUROPE DATA


Stata/MP 12.1 - [Results]
File Edit Data Graphics Statistics User Window Help
Review
Command _rc
There are no items to show.
(R)
12.1 Copyright 1985-2011 StataCorp LP
Statistics/Data Analysis StataCorp
4905 Lakeway Drive
MP - Parallel Edition College Station, Texas 77845 USA
800-STATA-PC http://www.stata.com
979-696-4600 stata@stata.com
979-696-4601 (fax)
2-user 2-core Stata network perpetual license:
Serial number: 50120527735
Licensed to: ZoneA
University of Bristol
Notes:
1. (/v# option or -set maxvar-) 5000 maximum variables
running C:\Program Files (x86)\Stata12\sysprofile.do ...
running C:\Users\gl9158\profile.do ...
.
Variables
Variable Label
There are no items to show.
Properties
Variables
Name
Label
Type
Format
Value Label
Notes
Data
Filename
Label
Notes
Variables 0
Observations 0
Size 0
Memory 64M
Command
C:\Program Files (x86)\Stata12
CAP NUM OVR


Stata/MP 12.1 - [Results]
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Variable Label
There are no items to show.
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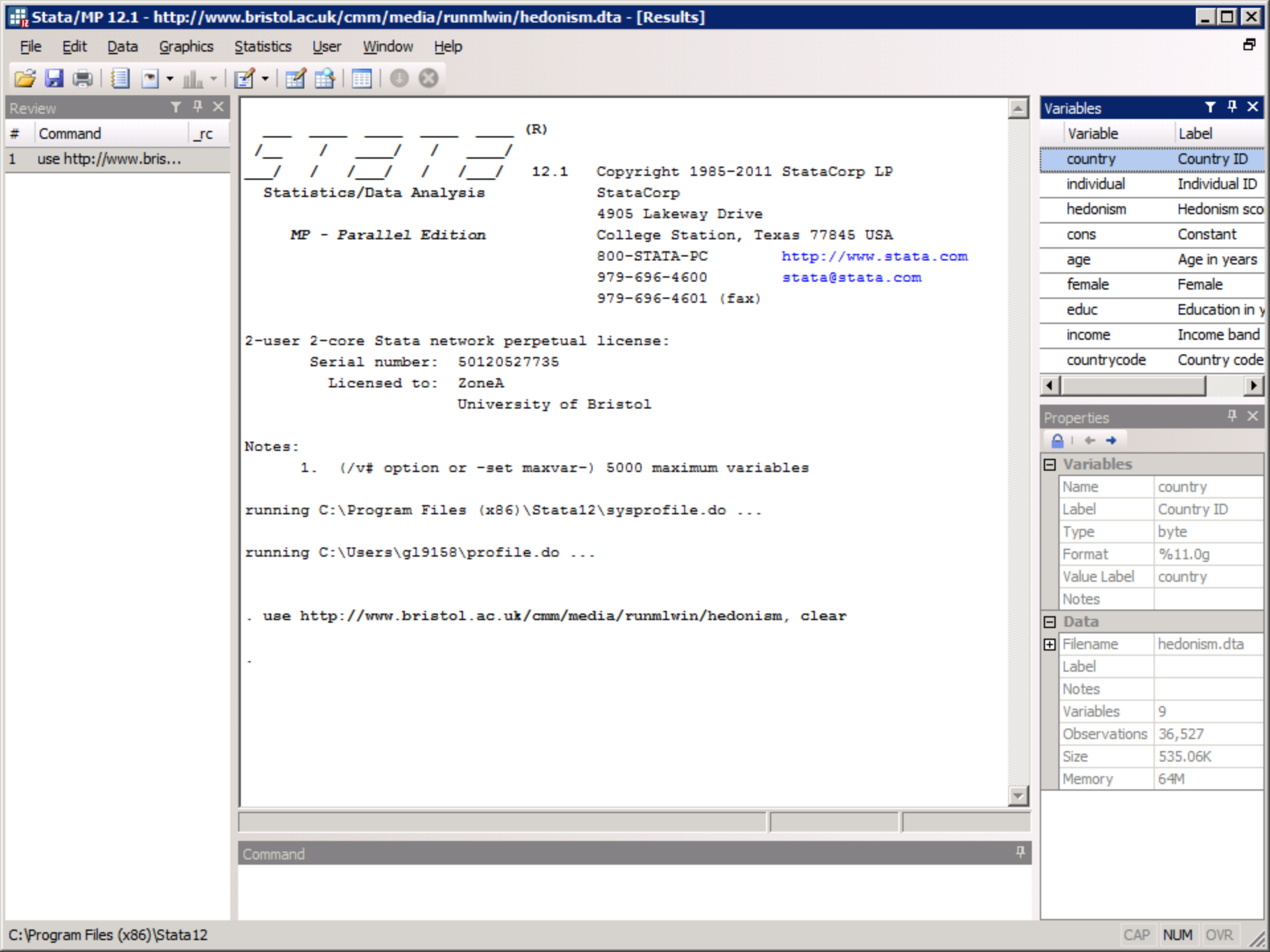
Variables
Name
Label
Type
Format
Value Label
Notes
Data
Filename
Label
Notes
Variables 0
Observations 0
Size 0
Memory 64M
Command
use http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism, clear
C:\Program Files (x86)\Stata12
CAP NUM OVR


Stata/MP 12.1 - http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism.dta - [Results]
File Edit Data Graphics Statistics User Window Help
Review
Command _rc
1 use http://www.bris...
(R)
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Statistics/Data Analysis StataCorp
4905 Lakeway Drive
MP - Parallel Edition College Station, Texas 77845 USA
800-STATA-PC http://www.stata.com
979-696-4600 stata@stata.com
979-696-4601 (fax)
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Serial number: 50120527735
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Notes:
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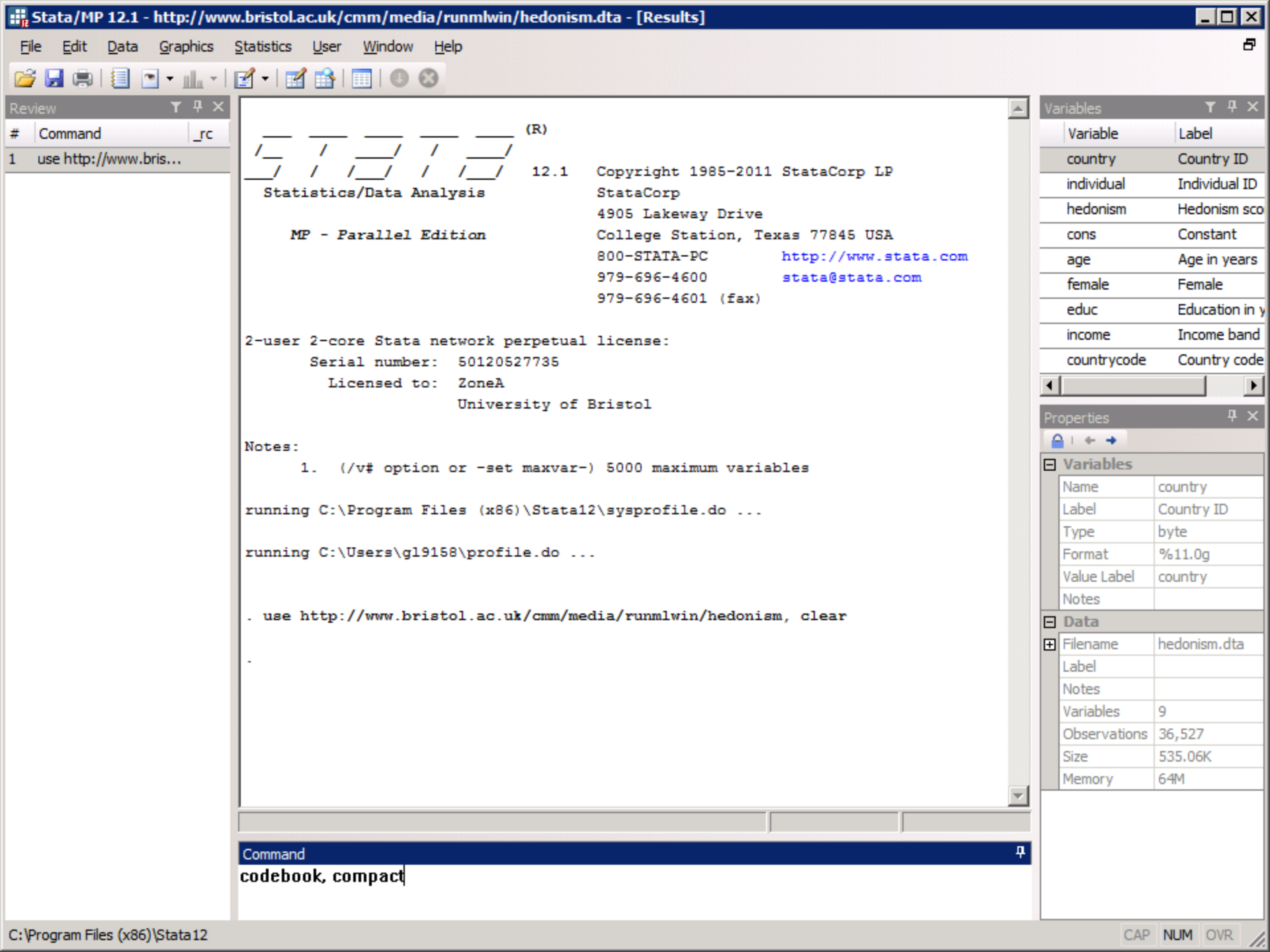
running C:\Program Files (x86)\Stata12\sysprofile.do ...
running C:\Users\gl9158\profile.do ...
. use http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism, clear
.
Command
Variables
Variable Label
country Country ID
individual Individual ID
hedonism Hedonism sco
cons Constant
age Age in years
female Female
educ Education in y
income Income band
countrycode Country code
Properties
Variables
Name country
Label Country ID
Type byte
Format %11.0g
Value Label country
Notes
Data
Filename hedonism.dta
Label
Notes
Variables 9
Observations 36,527
Size 535.06K
Memory 64M
C:\Program Files (x86)\Stata12
CAP NUM OVR


Stata/MP 12.1 - http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism.dta - [Results]
File Edit Data Graphics Statistics User Window Help
Review
Command _rc
1 use http://www.bris...
(R)
12.1 Copyright 1985-2011 StataCorp LP
Statistics/Data Analysis StataCorp
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running C:\Users\gl9158\profile.do ...
. use http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism, clear
.
Variables
Variable Label
country Country ID
individual Individual ID
hedonism Hedonism sco
cons Constant
age Age in years
female Female
educ Education in y
income Income band
countrycode Country code
Properties
Variables
Name country
Label Country ID
Type byte
Format %11.0g
Value Label country
Notes
Data
Filename hedonism.dta
Label
Notes
Variables 9
Observations 36,527
Size 535.06K
Memory 64M
Command
codebook, compact
C:\Program Files (x86)\Stata12
CAP NUM OVR

Stata/MP 12.1 - http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism.dta - [Results]

File Edit Data Graphics Statistics User Window Help

Review

#	Command	_rc
1	use http://www.bris...	
2	codebook, compact	

```
                                    979-696-4601 (fax)

2-user 2-core Stata network perpetual license:
       Serial number:  50120527735
         Licensed to:  ZoneA
                       University of Bristol

Notes:
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running C:\Program Files (x86)\Stata12\sysprofile.do ...

running C:\Users\gl9158\profile.do ...


. use http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism, clear

. codebook, compact

Variable       Obs Unique       Mean     Min     Max  Label
-------------------------------------------------------------------------------
country      36527     20   10.88318       1      22  Country ID
individual   36527  36527      18264       1   36527  Individual ID
hedonism     36527    607  -.2035884  -4.158    3.25  Hedonism score
cons         36527      1          1       1       1  Constant
age          36364     84   46.15595      14      98  Age in years
female       36496      2   .5291813       0       1  Female
educ         36082     35   11.92317       0      40  Education in years
income       29744     12   5.962816       1      12  Income band
countrycode  36527     20   10.88318       1      22  Country code
-------------------------------------------------------------------------------

.
```

Command

```
codebook, compact
```

Variables

Variable	Label
country	Country ID
individual	Individual ID
hedonism	Hedonism sco
cons	Constant
age	Age in years
female	Female
educ	Education in y
income	Income band
countrycode	Country code

Properties

Variables

Name	country
Label	Country ID
Type	byte
Format	%11.0g
Value Label	country
Notes	

Data

Filename	hedonism.dta
Label	
Notes	
Variables	9
Observations	36,527
Size	535.06K
Memory	64M

C:\Program Files (x86)\Stata12

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Stata/MP 12.1 - http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism.dta - [Results]

File Edit Data Graphics Statistics User Window Help

```
. use http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism, clear

. codebook, compact
```

Variable	Obs	Unique	Mean	Min	Max	Label
country	36527	20	10.88318	1	22	Country ID
individual	36527	36527	18264	1	36527	Individual ID
hedonism	36527	607	-.2035884	-4.158	3.25	Hedonism score
cons	36527	1	1	1	1	Constant
age	36364	84	46.15595	14	98	Age in years
female	36496	2	.5291813	0	1	Female
educ	36082	35	11.92317	0	40	Education in years
income	29744	12	5.962816	1	12	Income band
countrycode	36527	20	10.88318	1	22	Country code

Variables

Variable
country
individual
hedonism
cons
age
female
educ
income
countryc...

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Two-level variance components model

$$\mathbf{hedonism}_{ij} = \beta_0 + u_j + e_{ij}$$

$$u_j \sim \mathrm{N}(0, \sigma_u^2)$$

$$e_{ij} \sim \mathrm{N}(0, \sigma_e^2)$$

```
. runmlwin hedonism cons,
      level2(country: cons) ///
      level1(individual: cons)
```

Stata/MP 12.1 - http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism.dta - [Results]

File Edit Data Graphics Statistics User Window Help

```
. runmlwin hedonism cons, level2(country: cons) level1(individual: cons)
```

Variables

Variable
country
individual
hedonism
cons
age
female
educ
income
countryc...

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CAP NUM OVR

Stata/MP 12.1 - http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism.dta - [Results]

File Edit Data Graphics Statistics User Window Help

MLwiN

Version 2.25

Software authors :
Jon Rasbash
and
William Browne
Michael Healy
Bruce Cameron
Christopher Charlton

Feburary 2012

We are grateful to the ESRC for their sustained support.

```
. runmlwin hedonism cons, level2(country: cons) level1(individual: cons)
```

Variables

Variable
country
individual
edonism
ons
ge
emale
duc
come
ountryc...

C:\Program Files (x86)\Stata12

CAP NUM OVR

MLwiN - [Equations]
File Edit Options Model Estimation Data Manipulation Basic Statistics Graphs Window Help
Start More Stop IGLS
Estimation control..
Resume macro
Abort Macro
$\text{hedonism}_{ij} \sim \text{N}(XB, \Omega)$
$\text{hedonism}_{ij} = \beta_{0ij}\text{cons}$
$\beta_{0ij} = \beta_0 + u_{0j} + e_{0ij}$
$\begin{bmatrix} u_{0j} \end{bmatrix} \sim \text{N}(0, \Omega_u) : \Omega_u = \begin{bmatrix} \sigma^2_{u0} \end{bmatrix}$
$\begin{bmatrix} e_{0ij} \end{bmatrix} \sim \text{N}(0, \Omega_e) : \Omega_e = \begin{bmatrix} \sigma^2_{e0} \end{bmatrix}$
(36527 of 36527 cases in use)
Name + - Add Term Estimates Nonlinear Clear Notation Responses Store Help Zoom 150
random fixed iteration 0
Equations

$$\text{hedonism}_{ij} \sim \text{N}(XB,\ \Omega)$$

$$\text{hedonism}_{ij} = \beta_{0ij}\text{cons}$$

$$\beta_{0ij} = -0.203(0.067) + u_{0j} + e_{0ij}$$

$$\begin{bmatrix} u_{0j} \end{bmatrix} \sim \text{N}(0,\ \Omega_u) : \Omega_u = \begin{bmatrix} 0.090(0.029) \end{bmatrix}$$

$$\begin{bmatrix} e_{0ij} \end{bmatrix} \sim \text{N}(0,\ \Omega_e) : \Omega_e = \begin{bmatrix} 0.885(0.007) \end{bmatrix}$$

*-2*loglikelihood(IGLS Deviance)* = 99303.351(36527 of 36527 cases in use)

Stata/MP 12.1 - http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism.dta - [Results]

File Edit Data Graphics Statistics User Window Help

```
.
. runmlwin hedonism cons, level2(country: cons) level1(individual: cons)

MLwiN 2.28 multilevel model                     Number of obs      =     36527
Normal response model
Estimation algorithm: IGLS
```

Level Variable	No. of Groups	Observations per Group Minimum	Average	Maximum
country	20	1213	1826.3	2785

```
Run time (seconds)    =       41.94
Number of iterations  =           3
Log likelihood        = -49651.676
Deviance              =  99303.352
```

hedonism	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
cons	-.2031523	.0671835	-3.02	0.002	-.3348295	-.0714752

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
Level 2: country				
var(cons)	.0897654	.0285461	.0338161	.1457147

Variables

- Variable
- country
- individual
- hedonism
- cons
- age
- female
- educ
- income
- countryc...

C:\Program Files (x86)\Stata12

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Refit the model by RIGLS and retrieve the level-2 residuals

$$\mathbf{hedonism}_{ij} = \beta_0 + u_j + e_{ij}$$

$$u_j \sim \mathrm{N}(0, \sigma_u^2)$$

$$e_{ij} \sim \mathrm{N}(0, \sigma_e^2)$$

```
. runmlwin hedonism cons, ///
      level2(country: cons, residuals(u)) ///
      level1(individual: cons) ///
      rigls nogroup nopause
```

Stata/MP 12.1 - http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism.dta - [Results]

File Edit Data Graphics Statistics User Window Help

```
. runmlwin hedonism cons, level2(country: cons, residuals(u)) level1(individual:
> cons) rigls nogroup nopause

MLwiN 2.28 multilevel model                     Number of obs      =     36527
Normal response model
Estimation algorithm: RIGLS
Run time (seconds)          =         2.77
Number of iterations        =            3
Log restricted-likelihood = -49651.688
Restricted-deviance         =  99303.375
```

hedonism	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
cons	-.2031516	.0689179	-2.95	0.003	-.3382282	-.0680751

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
Level 2: country				
var(cons)	.0944864	.0298413	.0359985	.1529742
Level 1: individual				
var(cons)	.8850616	.0065509	.8722221	.8979011

```
.
.
.
```

Variables

Variable
country
individual
hedonism
cons
age
female
educ
income
countryc...
u0
u0se

C:\Program Files (x86)\Stata12

CAP NUM OVR

Stata/MP 12.1 - http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism.dta - [Results]

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```
MLwiN 2.28 multilevel model                       Number of obs      =     36527
Normal response model
Estimation algorithm: RIGLS
Run time (seconds)          =       2.52
Number of iterations        =          3
Log restricted-likelihood = -49651.688
Restricted-deviance         =  99303.375
```

hedonism	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
cons	-.2031516	.0689179	-2.95	0.003	-.3382282	-.0680751

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
Level 2: country				
var(cons)	.0944864	.0298413	.0359985	.1529742
Level 1: individual				
var(cons)	.8850616	.0065509	.8722221	.8979011

```
. display 0.094/(0.094 + 0.885)
.09601634

. display [RP2]var(cons)/([RP2]var(cons) + [RP1]var(cons))
.09645915

.
```

$$\text{VPC} = \text{ICC} = \frac{\sigma_u^2}{\sigma_u^2 + \sigma_e^2}$$

Variables

- Variable
- country
- individual
- hedonism
- cons
- age
- female
- educ
- income
- countryc...
- u0
- u0se

C:\Program Files (x86)\Stata12

CAP NUM OVR

Stata/MP 12.1 - http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism.dta - [Results]

File Edit Data Graphics Statistics User Window Help

```
. estimates store VC

. runmlwin hedonism cons, level2(country:) level1(individual: cons) rigls noheade
> r nopause
```

hedonism	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
cons	-.2035884	.0051563	-39.48	0.000	-.2136946	-.1934821

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
Level 1: individual				
var(cons)	.9711704	.0071863	.9570856	.9852553

```
. estimates store SL

. lrtest SL VC

Likelihood-ratio test                                 LR chi2(1)  =     3286.23
(Assumption: SL nested in VC)                         Prob > chi2 =     0.0000

.
.
.
.
```

$$H_0: \sigma_u^2 = 0; H_1: \sigma_u^2 > 0; \qquad \chi_1^2 = 3286, p < 0.01$$

Variables

Variable
country
individual
hedonism
cons
age
female
educ
income
countryc...
u0
u0se
_est_VC
_est_SL

C:\Program Files (x86)\Stata12

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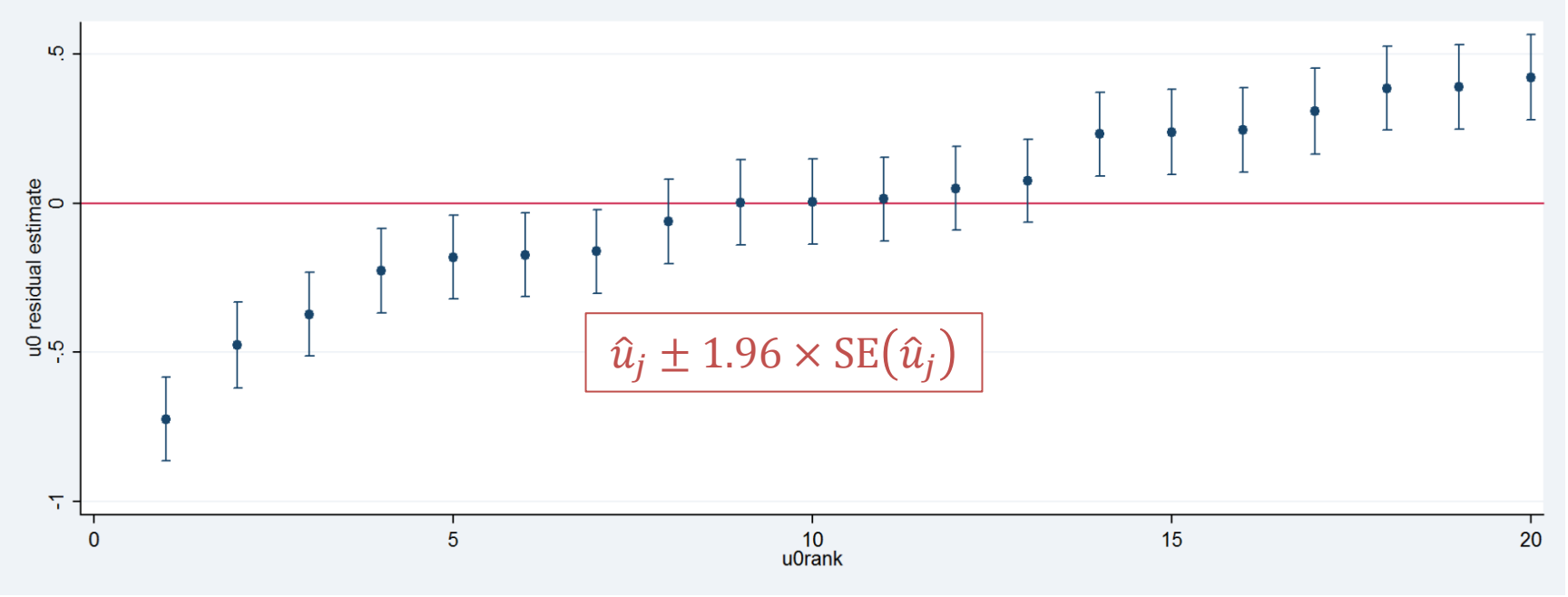
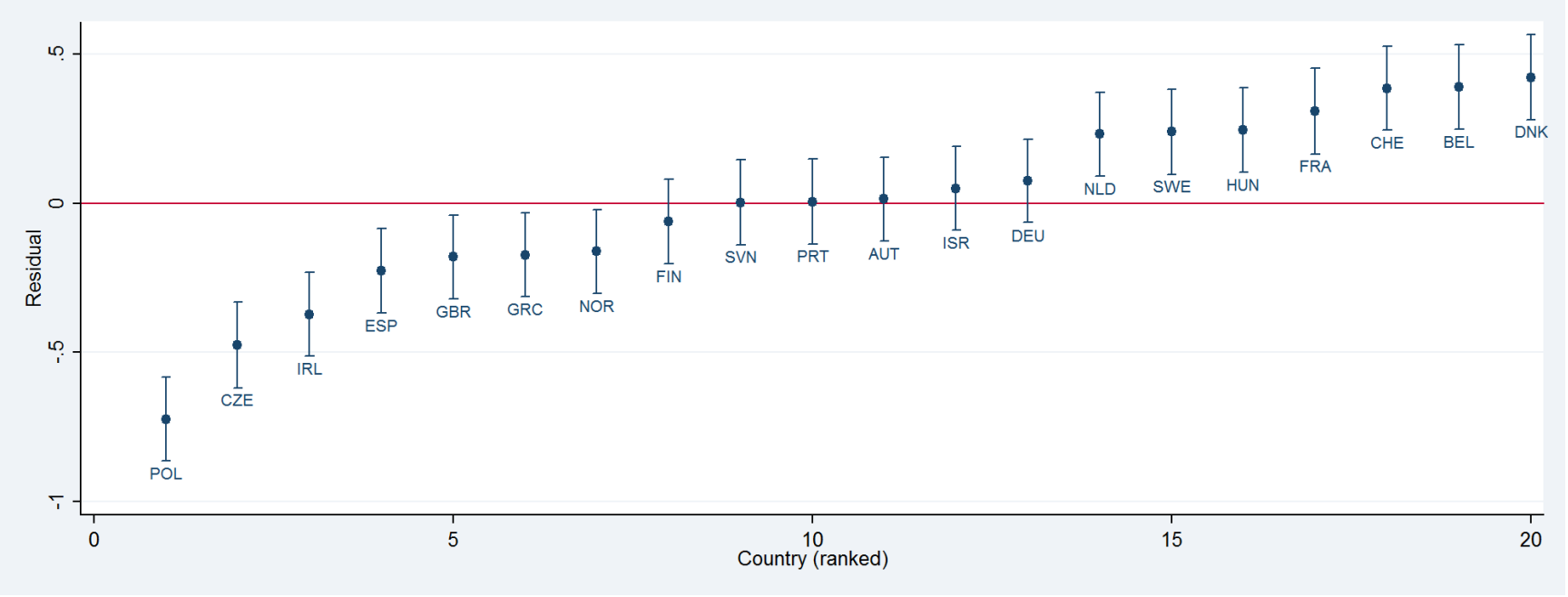
Caterpillar plot showing country residuals with 95% CIs




```
. keep country countrycode u0 u0se
. duplicates drop
. isid country
. sort u0
. generate u0rank = _n
. serrbar u0 u0se u0rank, scale(1.96) yline(0)
```

Caterpillar plot showing country residuals with 95% CIs




```
. serrbar u0 u0se u0rank, scale(1.96)
> mvopts(mlabel(countrycode)
> mlabposition(6) mlabgap(huge))
> ytitle("Residual") yline(0) xtitle("Country (ranked)")
```

Two-level random-intercept model with covariates

$$\mathbf{hedonism}_{ij} = \beta_0 + \beta_1 \mathbf{age46}_{ij} + u_j + e_{ij}$$

$$u_j \sim \mathrm{N}(0, \sigma_u^2)$$

$$e_{ij} \sim \mathrm{N}(0, \sigma_e^2)$$

```
. generate age46 = age - 46
. runmlwin hedonism cons age46, ///
      level2(country: cons, residuals(u)) ///
      level1(individual: cons) ///
      rigls noheader nopause
```

Stata/MP 12.1 - http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism.dta - [Results]

File Edit Data Graphics Statistics User Window Help

```
.
. generate age46 = age - 46
(163 missing values generated)

. runmlwin hedonism cons age46, level2(country: cons, residuals(u)) level1(individ
> ual: cons) rigls nogroup nopause

MLwiN 2.28 multilevel model                     Number of obs      =     36364
Normal response model
Estimation algorithm: RIGLS
Run time (seconds)        =       3.46
Number of iterations      =          3
Log restricted-likelihood = -47294.555
Restricted-deviance       =  94589.109
```

hedonism	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
cons	-.198907	.0687597	-2.89	0.004	-.3336736	-.0641404
age46	-.0174069	.0002581	-67.45	0.000	-.0179127	-.0169011

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
Level 2: country				
var(cons)	.094105	.0297527	.0357908	.1524193
Level 1: individual				
var(cons)	.7869442	.0058377	.7755025	.7983859

Variables

- Variable
- country
- individual
- hedonism
- cons
- age
- female
- educ
- income
- countryc...
- age46
- u0
- u0se

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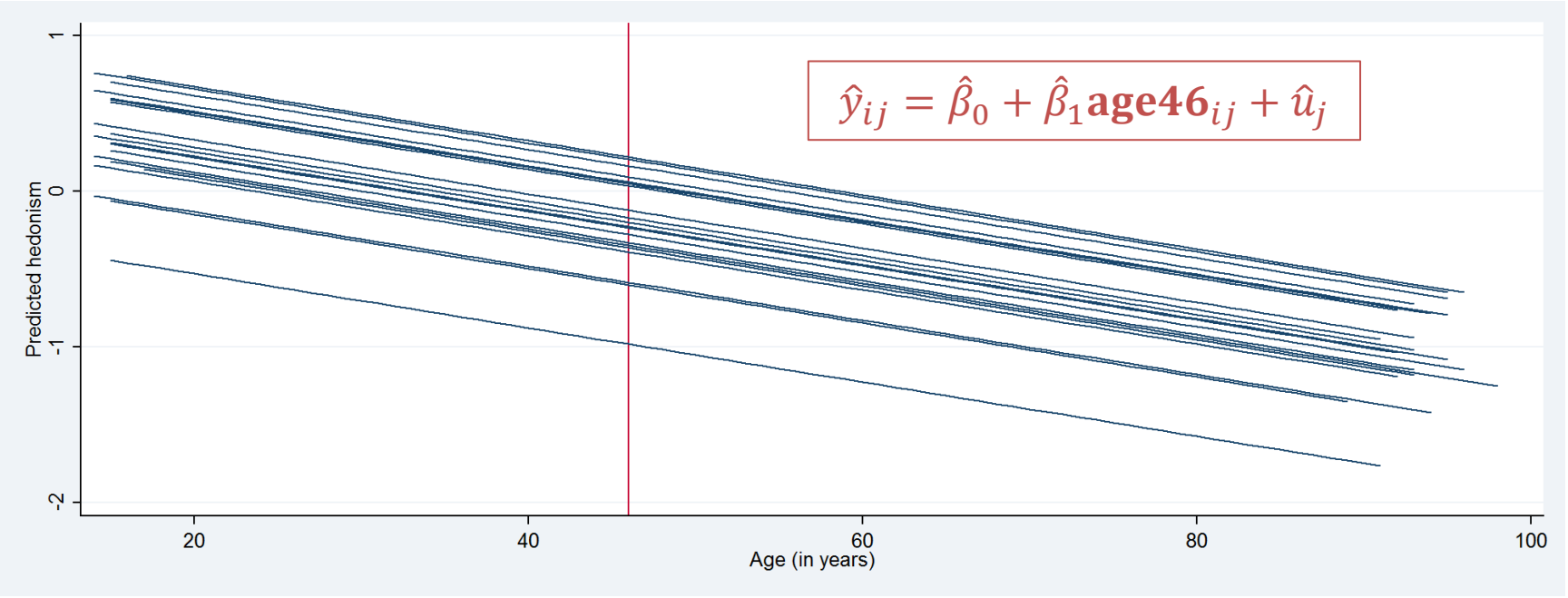
Predicted country lines




```
. predict predxb
. generate predxbu = predxb + u0
. sort country age46
. twoway (line predxbu age, connect(ascending)),
> ytitle("Predicted hedonism")
> xtitle("Age (in years)") xline(46)
```

Two-level random-slope model

$$\mathbf{hedonism}_{ij} = \beta_0 + \beta_1 \mathbf{age46}_{ij} + u_{0j} + u_{1j}\mathbf{age46}_{ij} + e_{ij}$$

$$\begin{pmatrix} u_{0j} \\ u_{1j} \end{pmatrix} \sim \mathrm{N}\left\{ \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \sigma^2_{u0} & \\ \sigma_{u01} & \sigma^2_{u1} \end{pmatrix} \right\}$$

$$e_{ij} \sim \mathrm{N}(0, \sigma^2_e)$$

```
. runmlwin hedonism cons age46, ///
      level2(country: cons age46, residuals(u)) ///
      level1(individual: cons) ///
      rigls noheader nopause
```

Stata/MP 12.1 - http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism.dta - [Results]

File Edit Data Graphics Statistics User Window Help

```
. runmlwin hedonism cons age46, level2(country: cons age46, residuals(u)) level1(i
> ndividual: cons) rigls noheader nopause
```

hedonism	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
cons	-.1999337	.06904	-2.90	0.004	-.3352496	-.0646177
age46	-.0176279	.0010115	-17.43	0.000	-.0196104	-.0156453

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
Level 2: country				
var(cons)	.0948761	.0301369	.035809	.1539433
cov(cons,age46)	.0009578	.0003784	.0002161	.0016995
var(age46)	.0000191	6.47e-06	6.41e-06	.0000318
Level 1: individual				
var(cons)	.7810343	.0057955	.7696754	.7923932

```
. estimates store RS

. lrtest RI RS

Likelihood-ratio test                           LR chi2(2)  =     232.19
(Assumption: RI nested in RS)                   Prob > chi2 =     0.0000
```

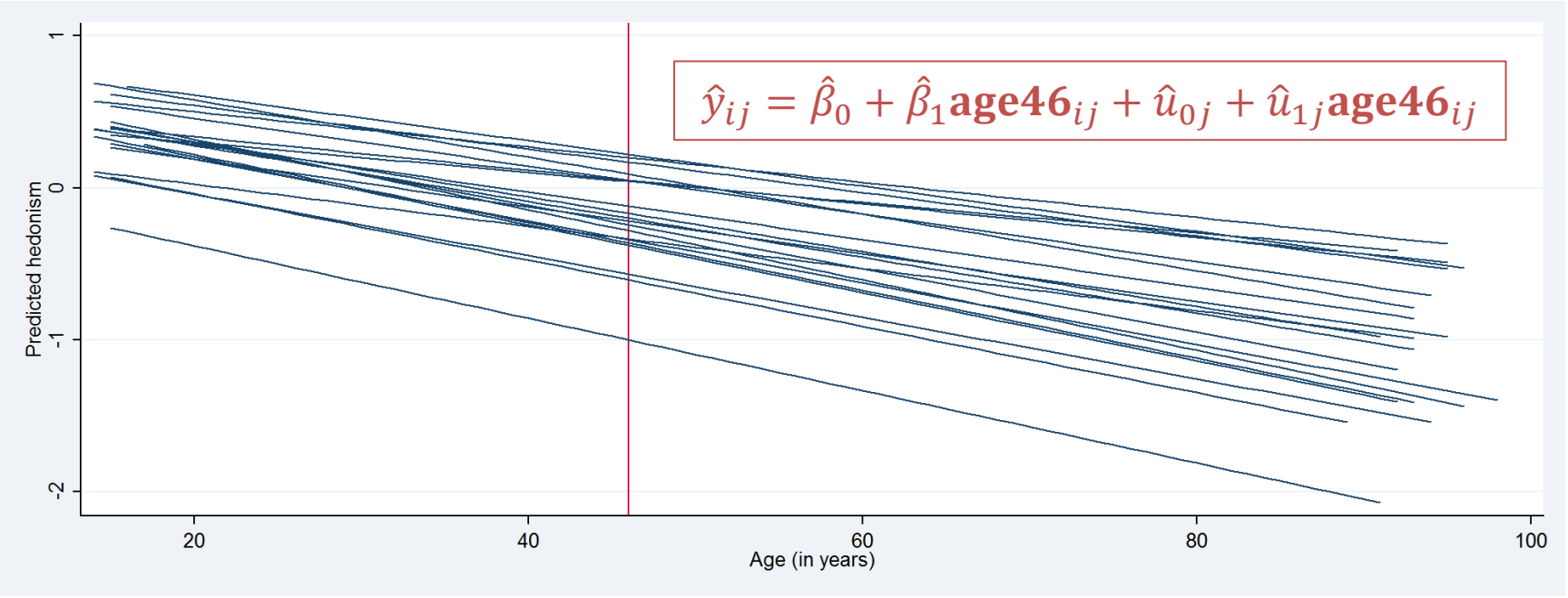
Variables

- Variable
- country
- individual
- hedonism
- cons
- age
- female
- educ
- income
- countryc...
- age46
- u0
- u1
- u0se
- u1se
- _est_RS

C:\Program Files (x86)\Stata12

CAP NUM OVR

Predicted country lines




```
. predict predxb
. generate predxbu = predxb + u0 + u1*age46
. sort country age46
. twoway (line predxbu age, connect(ascending)),
> ytitle("Predicted hedonism") xtitle("Age (in years)")
> xline(46)
```

Stata/MP 12.1 - http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism.dta - [Results]

File Edit Data Graphics Statistics User Window Help

```
. runmlwin, noheader correlations
```

hedonism	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
cons	-.1999337	.06904	-2.90	0.004	-.3352496	-.0646177
age46	-.0176279	.0010115	-17.43	0.000	-.0196104	-.0156453

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
Level 2: country				
var(cons)	.0948761	.0301369	.035809	.1539433
corr(cons,age46)	.7117642	.1190144	.4785001	.9450282
var(age46)	.0000191	6.47e-06	6.41e-06	.0000318
Level 1: individual				
var(cons)	.7810343	.0057955	.7696754	.7923932

$$\rho_{u01} = \frac{\sigma_{u01}}{\sqrt{\sigma_{u0}^2 \sigma_{u1}^2}}$$

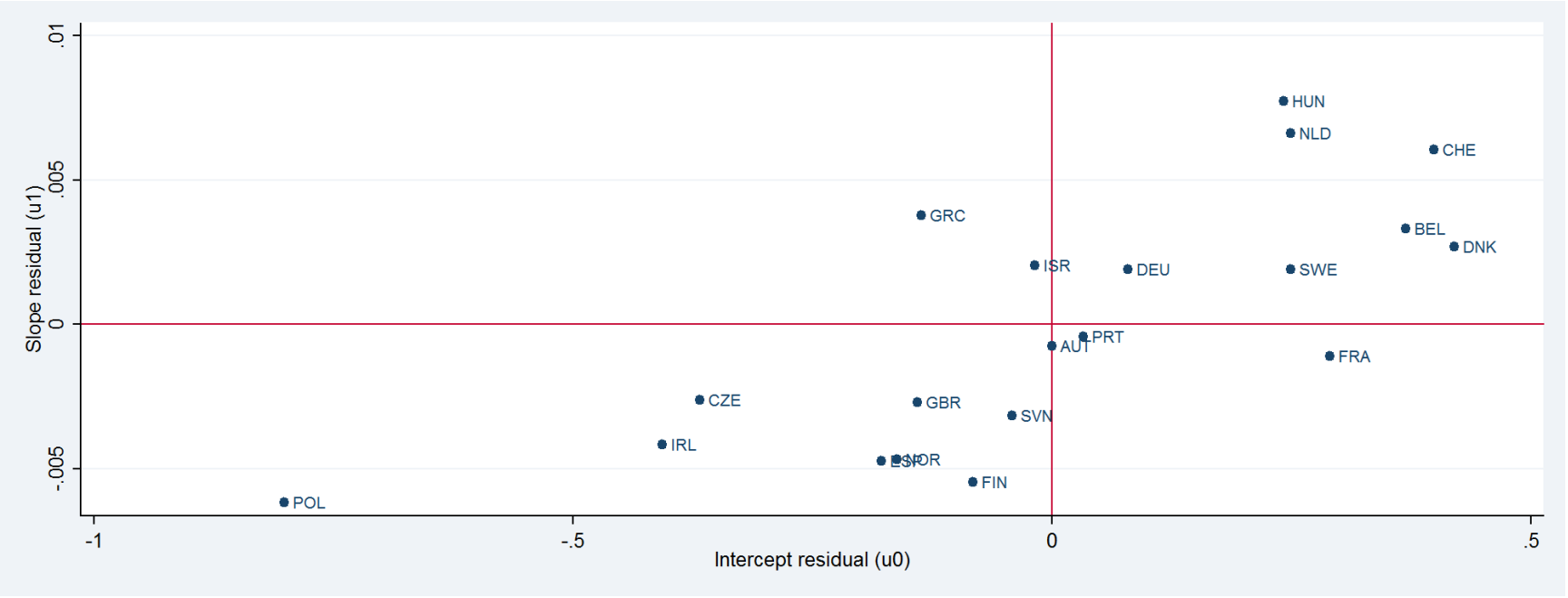
Variables

- Variable
- country
- individual
- hedonism
- cons
- age
- female
- educ
- income
- countryc...
- age46
- u0
- u1
- u0se
- u1se
- _est_RS
- predxb
- predxbu

C:\Program Files (x86)\Stata12

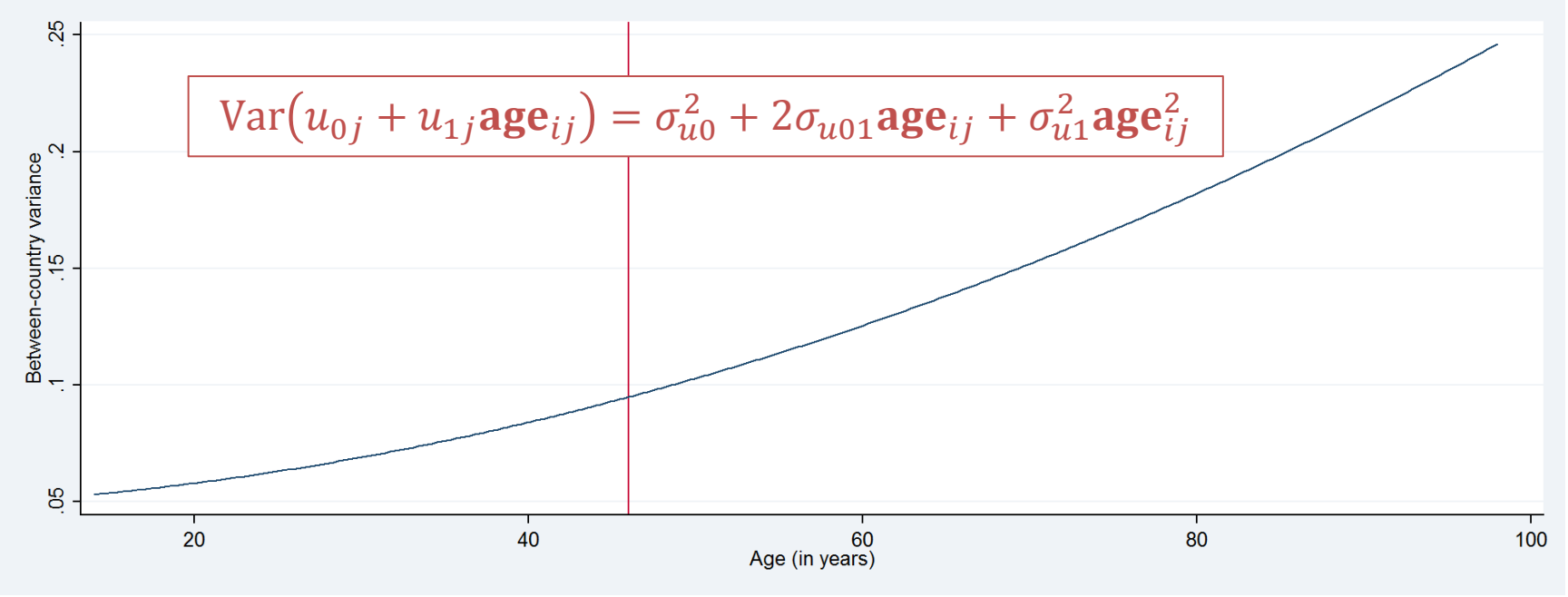
CAP NUM OVR

Slope vs. Intercept residuals




```
. keep country countrycode u0 u1
. duplicates drop
. isid country
. twoway (scatter u1 u0, mlabel(countrycode)),
> ytitle("Slope residual (u1)") yline(0)
> xtitle("Intercept residual (u0)") xline(0)
```

Between-country variance as a function of age




```
. generate lev2var = [RP2]var(cons)
> + 2*[RP2]cov(cons\age46)*age46 + [RP2]var(age46)*age46^2
. twoway (line lev2var age, sort),
> ytitle("Between-country variance") xline(46)
```

Stata/MP 12.1 - http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism.dta - [Results]

File Edit Data Graphics Statistics User Window Help

```
. estimates table SL VC RI RS, stats(deviance) b(%4.3f) stfmt(%6.0f) varwidth(15)
```

Variable	SL	VC	RI	RS
FP1				
cons	-0.204	-0.203	-0.199	-0.200
age46			-0.017	-0.018
RP1				
var(cons)	0.971	0.885	0.787	0.781
RP2				
var(cons)		0.094	0.094	0.095
cov(cons\age46)				0.001
var(age46)				0.000
Statistics				
deviance	102590	99303	94589	94357

```
.
.
.
.
.
.
.
.
```

Variables

- Variable
- country
- individual
- hedonism
- cons
- age
- female
- educ
- income
- countryc...
- age46
- u0
- u1
- u0se
- u1se
- _est_RS
- predxb
- predxbu
- lev2var

C:\Program Files (x86)\Stata12

CAP NUM OVR

2. RUNNING MLWIN FROM WITHIN STATA MAKES IT EASY TO REPRODUCE AND DOCUMENT ANALYSES

Do-file Editor - bristol2013.do

File Edit Tools View

bristol2013.do

```
39
40  ********************************************************************************
41  * 1. Example analyses using the Hedonism in Europe data
42  ********************************************************************************
43
44  * Load the hedonism.dta dataset
45  use http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism, clear
46
47  * Describe and summarize all variables in the data
48  codebook, compact
49
50
51  ********************************************************************************
52  * Variance-components model
53  ********************************************************************************
54
55  * Reload the data
56  use http://www.bristol.ac.uk/cmm/media/runmlwin/hedonism, clear
57
58  * Fit the variance-components model by IGLS
59  runmlwin hedonism cons, level2(country: cons) level1(individual: cons)
60
61  * Refit the variance-components model by RIGLS and retrieve the level-2
62  * residuals
63  runmlwin hedonism cons, ///
64      level2(country: cons, residuals(u)) ///
65      level1(individual: cons) ///
66      rigls nogroup nopause
67
68  * Calculate the VPC/ICC
69  display 0.094/(0.094 + 0.885)
70
```

Ready

Line: 41, Col: 5 CAP NUM OVR

3. RESOURCES TO HELP YOU LEARN `runmlwin`

help runmlwin

Title

runmlwin - Run the MLwiN multilevel modelling software from within Stata

Syntax

runmlwin *responses_and_fixed_part*, *random_part* [discrete(*discrete_options*)]
[mcmc(*mcmc_options*)] [*general_options*]

where the syntax of *responses_and_fixed_part* is one of the following

for univariate continuous, binary, proportion and count response models

depvar indepvars [*if*] [*in*]

for univariate ordered and unordered categorical response models

depvar indepvars1 [(*indepvars2*, **contrast**(*numlist*)) ...] [*if*] [*in*]

where *indepvars1* are those independent variables which appear with separate coefficients in each of every log-odds contrast, while *indepvars2* are those independent variables which appear with common coefficients for those log-odds contrasts specified in **contrast**(*numlist*). Contrasts can be thought of as the separate "subequations" or "arms" of a multinomial response model. These contrasts are indexed 1,2, ... up to the total number of contrasts

Examples

IMPORTANT. The following examples will only work on your computer once you have installed MLwiN and once you have told **runmlwin** what the mlwin.exe file address is. See *Remarks on installing runmlwin* above for more information.

(a) Continuous response models

Two-level models

Setup

```
. use http://www.bristol.ac.uk/cmm/media/runmlwin/tutorial, clear
```

Two-level random-intercept model, analogous to xtreg (fitted using IGLS)
(See Section 2.5 of the MLwiN User Manual)

```
. runmlwin normexam cons standlrt, level2(school: cons) level1(student: cons)
    nopause
```

Two-level random-intercept and random-slope (coefficient) model (fitted using IGLS)
(See Section 4.4 of the MLwiN User Manual)

```
. runmlwin normexam cons standlrt, level2 (school: cons standlrt) level1
    (student: cons) nopause
```

Refit the model, where this time we additionally calculate the level 2 residuals (fitted using IGLS)
(See Section 4.4 of the MLwiN User Manual)

```
. runmlwin normexam cons standlrt, level2 (school: cons standlrt, residuals(u))
    level1 (student: cons) nopause
```

Two-level random-intercept and random-slope (coefficient) model with a complex level

University of BRISTOL | Centre for Multilevel Modelling

runmlwin: Running MLwiN from within Stata

runmlwin is a Stata command which allows Stata users to run the powerful MLwiN multilevel modelling software from within Stata.

The multilevel models fitted by **runmlwin** are often considerably faster than those fitted by the Stata's **xtmixed, xtmelogit** and **xtmepoisson** commands. The range of models which can be fitted by **runmlwin** is also much wider than those commands. **runmlwin** also allows fast estimation on large data sets for many of the more complex multilevel models available through the user written **gllamm** command.

MLwiN has the following features:

1. Estimation of multilevel models for continuous, binary, count, ordered categorical and unordered categorical data
2. Fast estimation via classical and Bayesian methods
3. Estimation of multilevel models for cross-classified and multiple membership nonhierarchical data structures
4. Estimation of multilevel multivariate response models, multilevel spatial models, multilevel measurement error models and multilevel multiple imputation models

These details with a screen shot are available on our **runmlwin** leaflet (pdf, 0.1mb)

CENTRE FOR MULTILEVEL MODELLING
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  - Realcom
  - Stat-JR
  - MLPowSim
  - R2MLwiN
  - runmlwin
    - Presentations
    - Examples
    - Citations
    - User Forum

University home > Centre for Multilevel Modelling... > Software > runmlwin > Examples

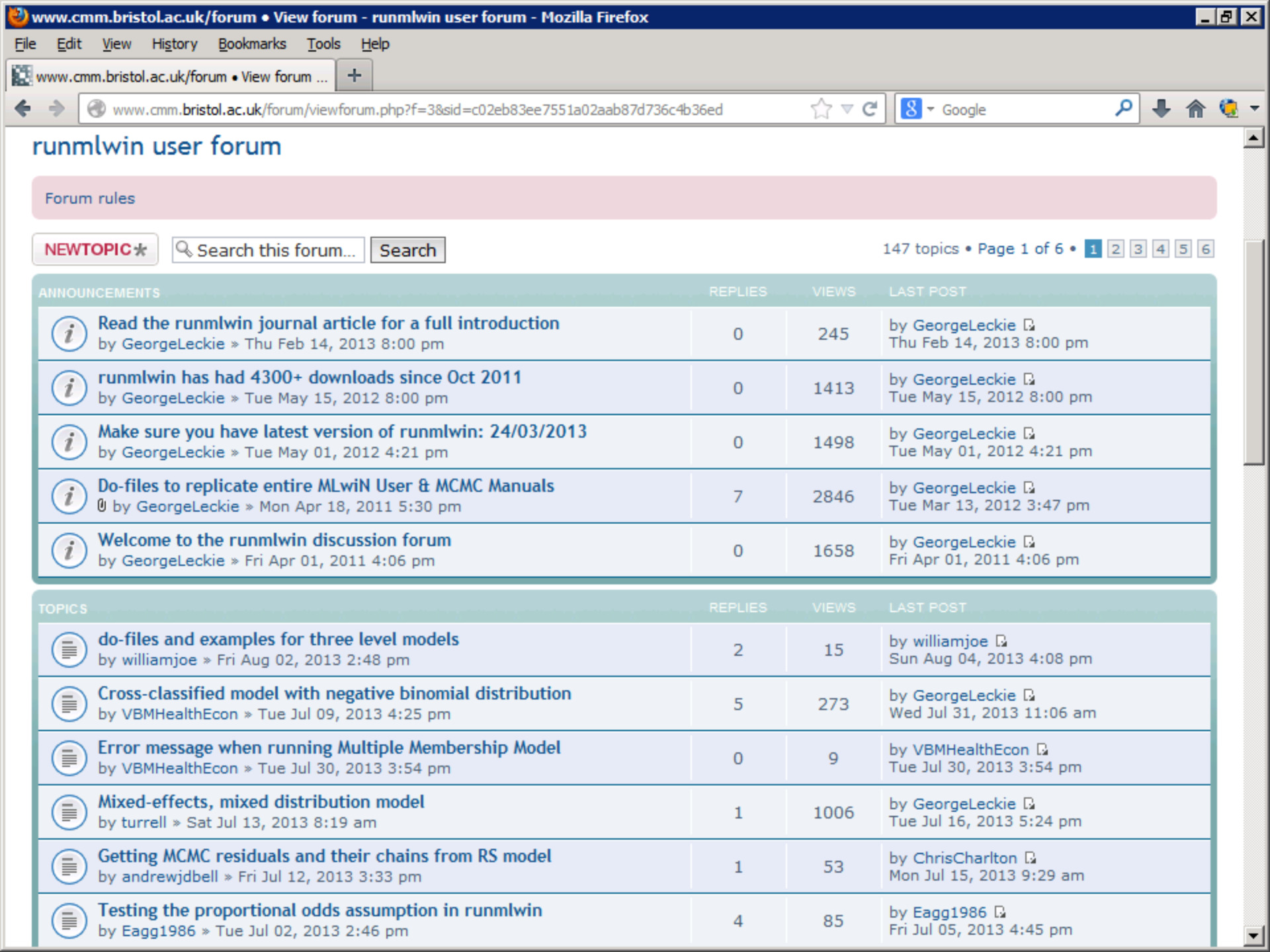
Examples using runmlwin

MLwiN User Manual

These do-files and log files replicate the analyses reported in the MLwiN User Manual (PDF, 4.6 mb) Rasbash, J., Steele, F., Browne, W.J. and Goldstein, H. (2012) Centre for Multilevel Modelling, University of Bristol.

Note that we have not created do-files for Chapters 1, 8 or 19 of the manual as no models are fitted in those chapters. We have also not yet created the do-file for Chapter 17.

- 1 Introducing Multilevel Models
- 2 Introduction to Multilevel Modelling (do | log)
- 3 Residuals (do | log)
- 4 Random Intercept and Random Slope Models (do | log)
- 5 Graphical Procedures for Exploring the Model (do | log)
- 6 Contextual Effects (do | log)
- 7 Modelling the Variance as a Function of Explanatory Variables (do | log)
- 8 Getting Started with your Data
- 9 Logistic Models for Binary and Binomial Responses (do | log)



runmlwin user forum

Forum rules

NEWTOPIC* Search this forum... Search

147 topics • Page 1 of 6 • 1 2 3 4 5 6

ANNOUNCEMENTS	REPLIES	VIEWS	LAST POST
Read the runmlwin journal article for a full introduction by GeorgeLeckie » Thu Feb 14, 2013 8:00 pm	0	245	by GeorgeLeckie Thu Feb 14, 2013 8:00 pm
runmlwin has had 4300+ downloads since Oct 2011 by GeorgeLeckie » Tue May 15, 2012 8:00 pm	0	1413	by GeorgeLeckie Tue May 15, 2012 8:00 pm
Make sure you have latest version of runmlwin: 24/03/2013 by GeorgeLeckie » Tue May 01, 2012 4:21 pm	0	1498	by GeorgeLeckie Tue May 01, 2012 4:21 pm
Do-files to replicate entire MLwiN User & MCMC Manuals by GeorgeLeckie » Mon Apr 18, 2011 5:30 pm	7	2846	by GeorgeLeckie Tue Mar 13, 2012 3:47 pm
Welcome to the runmlwin discussion forum by GeorgeLeckie » Fri Apr 01, 2011 4:06 pm	0	1658	by GeorgeLeckie Fri Apr 01, 2011 4:06 pm

TOPICS	REPLIES	VIEWS	LAST POST
do-files and examples for three level models by williamjoe » Fri Aug 02, 2013 2:48 pm	2	15	by williamjoe Sun Aug 04, 2013 4:08 pm
Cross-classified model with negative binomial distribution by VBMHealthEcon » Tue Jul 09, 2013 4:25 pm	5	273	by GeorgeLeckie Wed Jul 31, 2013 11:06 am
Error message when running Multiple Membership Model by VBMHealthEcon » Tue Jul 30, 2013 3:54 pm	0	9	by VBMHealthEcon Tue Jul 30, 2013 3:54 pm
Mixed-effects, mixed distribution model by turrell » Sat Jul 13, 2013 8:19 am	1	1006	by GeorgeLeckie Tue Jul 16, 2013 5:24 pm
Getting MCMC residuals and their chains from RS model by andrewjdbell » Fri Jul 12, 2013 3:33 pm	1	53	by ChrisCharlton Mon Jul 15, 2013 9:29 am
Testing the proportional odds assumption in runmlwin by Eagg1986 » Tue Jul 02, 2013 2:46 pm	4	85	by Eagg1986 Fri Jul 05, 2013 4:45 pm