

ASDA2 ANALYSIS EXAMPLE REPLICATION SPSS C11

* Syntax for Analysis Example Replication C11
* Use data sets previously prepared in SAS, refer to SAS Analysis Example Replication for C11 for details.

* Single Wave Analyses.

* Complete Case for Single Wave.
* See SAS code for how data sets used were created.

```
GET  
SAS DATA='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\cc_1wave.sas7bdat'.  
DATASET NAME DataSet1 WINDOW=FRONT.
```

```
* Analysis Preparation Wizard.  
CSPLAN ANALYSIS  
/PLAN FILE='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_kwgt.csaplan'  
/PLANVARS ANALYSISWEIGHT=KWGTR  
/SRSESTIMATOR TYPE=WOR  
/PRINT PLAN  
/DESIGN STRATA=STRATUM CLUSTER=SECU  
/ESTIMATOR TYPE=WR.
```

```
* Complex Samples Descriptives.  
CSDESCRIPTIVES  
/PLAN FILE='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_kwgt.csaplan'  
/SUMMARY VARIABLES=ln_inc08  
/SUBPOP TABLE=KFINR DISPLAY=LAYERED  
/MEAN  
/STATISTICS SE CIN COUNT DEFF  
/MISSING SCOPE=LISTWISE.
```

```
compute mean=exp(10.4407).  
compute upci=exp(10.3880).  
compute lowci=exp(10.4934).  
execute.
```

```
DESCRIPTIVES VARIABLES=mean upci lowci  
/STATISTICS=DEFAULT.
```

```
* Adjusted Weight for Single Wave.  
GET  
SAS DATA='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\adj_wgt_1wave.sas7bdat'.  
DATASET NAME DataSet1 WINDOW=FRONT.
```

```
* Analysis Preparation Wizard.  
CSPLAN ANALYSIS  
/PLAN FILE='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_adj_kwgt.csaplan'  
/PLANVARS ANALYSISWEIGHT=adj_KWGTR  
/SRSESTIMATOR TYPE=WOR  
/PRINT PLAN  
/DESIGN STRATA=STRATUM CLUSTER=SECU  
/ESTIMATOR TYPE=WR.
```

```
* Complex Samples Descriptives.  
CSDESCRIPTIVES  
/PLAN FILE='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_adj_kwgt.csaplan'  
/SUMMARY VARIABLES=ln_inc08  
/SUBPOP TABLE=KFINR DISPLAY=LAYERED  
/MEAN  
/STATISTICS SE CIN COUNT DEFF  
/MISSING SCOPE=LISTWISE.
```

```
compute mean1=exp(10.4136).  
compute upci1=exp(10.3603).  
compute lowci1=exp(10.4669).  
execute.
```

```
DESCRIPTIVES VARIABLES=mean1 upci1 lowci1  
/STATISTICS=DEFAULT.
```

* Note: Multiple Imputation using Sequential Regression or Equivalent and Analysis of MI Data Sets NOT AVAILABLE in CS Commands.
* Note: MI using Selection Model NOT AVAILABLE in CS Commands.

```

* 2 Wave Analyses.

* Complete Case for Two Waves.
GET
  SAS DATA='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\cc_2waves.sas7bdat'.
DATASET NAME DataSet1 WINDOW=FRONT.

* Complex Samples Descriptives.
CSDESCRIPTIVES
  /PLAN FILE='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_kwgt.csaplan'
  /SUMMARY VARIABLES=incdiff_06_10
  /SUBPOP TABLE=KFINR DISPLAY=LAYERED
  /MEAN
  /STATISTICS SE CIN COUNT DEFF
  /MISSING SCOPE=LISTWISE.

* Adjusted Weight for Two Waves.
GET
  SAS DATA='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\adj_wgt_2waves.sas7bdat'.
DATASET NAME DataSet1 WINDOW=FRONT.

* Analysis Preparation Wizard.
CSPLAN ANALYSIS
  /PLAN FILE='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_adj_kwgt2.csaplan'
  /PLANVARS ANALYSISWEIGHT=adj_KWGTR
  /SRSESTIMATOR TYPE=WOR
  /PRINT PLAN
  /DESIGN STRATA=STRATUM CLUSTER=SECU
  /ESTIMATOR TYPE=WR.

* Complex Samples Descriptives.
CSDESCRIPTIVES
  /PLAN FILE='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_adj_kwgt2.csaplan'
  /SUMMARY VARIABLES=incdiff_06_10
  /SUBPOP TABLE=KFINR DISPLAY=LAYERED
  /MEAN
  /STATISTICS SE CIN COUNT DEFF
  /MISSING SCOPE=LISTWISE.

* Calibration Method for Two Waves.
GET
  SAS DATA='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\calibration_2waves.sas7bdat'.
DATASET NAME DataSet1 WINDOW=FRONT.

* Analysis Preparation Wizard.
CSPLAN ANALYSIS
  /PLAN FILE='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_calibration_2waves.csaplan'
  /PLANVARS ANALYSISWEIGHT=KWGTR_cal
  /SRSESTIMATOR TYPE=WOR
  /PRINT PLAN
  /DESIGN STRATA=STRATUM CLUSTER=SECU
  /ESTIMATOR TYPE=WR.

* Complex Samples Descriptives.
CSDESCRIPTIVES
  /PLAN FILE='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_calibration_2waves.csaplan'
  /SUMMARY VARIABLES=incdiff_06_10
  /SUBPOP TABLE=KFINR DISPLAY=LAYERED
  /MEAN
  /STATISTICS SE CIN COUNT DEFF
  /MISSING SCOPE=LISTWISE.

```

* 4 Waves of HRS data.

* Weighted Multilevel Model.

```
GET
  SAS DATA='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\wgt_multilevel_3pwaves.sas7bdat'.
  DATASET NAME DataSet1 WINDOW=FRONT.
  compute revgender=3 - gender.
  compute revstratum=57- stratum.
```

* Notes on this model:

Approximate weighted multilevel model with mixed linear model with stratum as model predictor, SPSS does not allow use of different weights for multiple levels in CS Commands
Model is modified to include random effects and level1 weight but no robust SE or level 2 weights in SPSS due to lack of ability to handle these features
This model serves as a demonstration of an approximation and is not strictly correct.

```
MIXED ln_inc BY REVGENDER REVSTRATUM WITH yrssince06 yrs06sq
  /CRITERIA=CIN(95) MXITER(100) MXSTEP(10) SCORING(1) SINGULAR(0.00000000001) HCONVERGE(0,
  ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)
  /FIXED YRSSINCE06 REVGENDER YRSSINCE06*REVGENDER YRS06SQ YRS06SQ*REVGENDER REVSTRATUM
  /RANDOM YRSSINCE06 YRS06SQ
  /METHOD=REML
  /PRINT=SOLUTION
  /REGWGT=level1wgt.
```

* Veiga et al. (2014) not available in SPSS CS Commands.

* Weighted GEE.

```
GET
  SAS DATA='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\wgt_gee_3pwaves.sas7bdat'.
  DATASET NAME DataSet1 WINDOW=FRONT.
  compute revgender=3 - gender.
  compute revstratum=57- stratum.
```

* Model results are very close to those from Stata, GENLIN allows Robust SE and STRATUM variable used as model predictor.

* Generalized Estimating Equations.

```
GENLIN ln_inc BY revgender revstratum (ORDER=ASCENDING) WITH yrssince06 yrs06sq
  /MODEL yrssince06 revgender yrs06sq yrssince06*revgender yrs06sq*revgender revstratum INTERCEPT=YES
  SCALEWEIGHT=casewt
  DISTRIBUTION=NORMAL LINK=IDENTITY
  /CRITERIA SCALE=MLE PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3(WALD) CILEVEL=95
  LIKELIHOOD=FULL
  /REPEATED SUBJECT=newid_num SORT=YES CORRTYPE=EXCHANGEABLE ADJUSTCORR=YES COVB=ROBUST
  /MISSING CLASSMISSING=EXCLUDE
  /PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.
```

* Export Output.

```
OUTPUT EXPORT
  /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=PRINTSETTING
  /DOC DOCUMENTFILE='P:\ASDA 2\Analysis Example Replication\SPSS\Analysis Example Replication '+
  'SPSS C11.doc'
  NOTESCAPTIONS=YES WIDETABLES=WRAP PAGEBREAKS=YES
  PAGESIZE=INCHES(8.5, 11.0) TOPMARGIN=INCHES(1.0) BOTTOMMARGIN=INCHES(1.0)
  LEFTMARGIN=INCHES(.5) RIGHTMARGIN=INCHES(.5).
```

OUTPUT ASDA2 ANALYSIS EXAMPLE REPLICATION SPSS C11

```
*****
* Single Wave Analyses.

* Complete Case for Single Wave.
GET
  SAS DATA='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\cc_1wave.sas7bdat'.
DATASET NAME DataSet1 WINDOW=FRONT.

* Analysis Preparation Wizard.
CSPLAN ANALYSIS
  /PLAN FILE='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_kwgt.csaplan'
  /PLANVARS ANALYSISWEIGHT=KWGTR
  /SRSESTIMATOR TYPE=WOR
  /PRINT PLAN
  /DESIGN STRATA=STRATUM CLUSTER=SECU
  /ESTIMATOR TYPE=WR.
```

Complex Samples: Plan

Summary

			Stage 1
Design Variables	Stratification	1	STRATUM ID
	Cluster	1	SAMPLING ERROR COMPUTATION UNIT
Analysis Information	Estimator Assumption		Sampling with replacement

Plan File: P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_kwgt.csaplan

Weight Variable: 2006 WEIGHT: RESPONDENT LEVEL

SRS Estimator: Sampling without replacement

```
* Complex Samples Descriptives.
CSD DESCRIPTIVES
  /PLAN FILE='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_kwgt.csaplan'
  /SUMMARY VARIABLES=ln_inc08
  /SUBPOP TABLE=KFINR DISPLAY=LAYERED
  /MEAN
  /STATISTICS SE CIN COUNT DEFF
  /MISSING SCOPE=LISTWISE.
```

Complex Samples: Descriptives

Univariate Statistics

	Estimate	Standard Error	95% Confidence Interval		Design Effect	Unweighted Count
			Lower	Upper		
Mean ln_inc08	10.4407	.02630	10.3880	10.4934	3.461	10574

Subpopulation Descriptives

Univariate Statistics

2006 WHETHER FINANCIAL RESPONDENT	Estimate	Standard Error	95% Confidence Interval		Design Effect
			Lower	Upper	

1	Mean	ln_inc08	10.4407	.02630	10.3880	10.4934	3.461
---	------	----------	---------	--------	---------	---------	-------

Univariate Statistics

2006 WHETHER FINANCIAL RESPONDENT				Unweighted Count			
1	Mean	ln_inc08					10574

```
compute mean=exp(10.4407).
compute upci=exp(10.3880).
compute lowci=exp(10.4934).
execute.
```

```
DESCRIPTIVES VARIABLES=mean upci lowci
/STATISTICS=DEFAULT.
```

Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
mean	11789	34224.60	34224.60	34224.6013	.00000
upci	11789	32467.67	32467.67	32467.6666	.00000
lowci	11789	36076.61	36076.61	36076.6096	.00000
Valid N (listwise)	11789				

* Adjusted Weight for Single Wave.
 GET
 SAS DATA='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\adj_wgt_1wave.sas7bdat'.

Warning # 7251. Command name: GET SAS
 One or more variable names were changed to satisfy the SPSS Statistics rules
 for names.
 DATASET NAME DataSet1 WINDOW=FRONT.

* Analysis Preparation Wizard.
 CSPLAN ANALYSIS
 /PLAN FILE='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_adj_kwgt.csaplan'
 /PLANVARS ANALYSISWEIGHT=adj_KWGTR
 /SRSESTIMATOR TYPE=WOR
 /PRINT PLAN
 /DESIGN STRATA=STRATUM CLUSTER=SECU
 /ESTIMATOR TYPE=WR.

Complex Samples: Plan

Summary

			Stage 1
Design Variables	Stratification	1	STRATUM ID
	Cluster	1	SAMPLING ERROR COMPUTATION UNIT
Analysis Information	Estimator Assumption		Sampling with replacement

Plan File: P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_adj_kwgt.csaplan

Weight Variable: adj_kwgtr

SRS Estimator: Sampling without replacement

* Complex Samples Descriptives.
 CSDESCRIPTIVES
 /PLAN FILE='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_adj_kwgt.csaplan'
 /SUMMARY VARIABLES=ln_inc08
 /SUBPOP TABLE=KFINR DISPLAY=LAYERED
 /MEAN
 /STATISTICS SE CIN COUNT DEFF
 /MISSING SCOPE=LISTWISE.

Complex Samples: Descriptives

Univariate Statistics

		Estimate	Standard Error	95% Confidence Interval		Design Effect	Unweighted Count
				Lower	Upper		
Mean	ln_inc08	10.4136	.02661	10.3603	10.4669	3.525	10574

Subpopulation Descriptives

Univariate Statistics

2006 WHETHER FINANCIAL RESPONDENT		Estimate	Standard Error	95% Confidence Interval		Design Effect
				Lower	Upper	
1	Mean ln_inc08	10.4136	.02661	10.3603	10.4669	3.525

Univariate Statistics

2006 WHETHER FINANCIAL RESPONDENT			Unweighted Count
1	Mean	ln_inc08	10574

```
compute mean1=exp(10.4136).
compute upci1=exp(10.3603).
compute lowci1=exp(10.4669).
execute.
```

```
DESCRIPTIVES VARIABLES=mean1 upci1 lowci1
/STATISTICS=DEFAULT.
```

Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
mean1	11789	33309.57	33309.57	33309.5693	.00000
upci1	11789	31580.65	31580.65	31580.6541	.00000
lowci1	11789	35133.14	35133.14	35133.1357	.00000
Valid N (listwise)	11789				

* Note: Multiple Imputation using Sequential Regression or Equivalent and Analysis of MI Data Sets NOT AVAILABLE in CS Commands.

* Note: MI using Selection Model NOT AVAILABLE in CS Commands.

* 2 Waves Analyses.

* Complete Case for Two Waves.

GET

SAS DATA='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\cc_2waves.sas7bdat'.
 DATASET NAME DataSet1 WINDOW=FRONT.

* Complex Samples Descriptives.

CSDSCRIPTIVES

/PLAN FILE='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_kwgt.csaplan'
 /SUMMARY VARIABLES=incdiff_06_10
 /SUBPOP TABLE=KFINR DISPLAY=LAYERED
 /MEAN
 /STATISTICS SE CIN COUNT DEFF
 /MISSING SCOPE=LISTWISE.

Complex Samples: Descriptives

Univariate Statistics

	Estimate	Standard Error	95% Confidence Interval		Design Effect	Unweighted Count
			Lower	Upper		
Mean incdiff_06_10	-6551.4016	1866.13456	-10289.7184	-2813.0849	1.081	9402

Subpopulation Descriptives

Univariate Statistics

2006 WHETHER FINANCIAL RESPONDENT	Estimate	Standard Error	95% Confidence Interval		Design Effect
			Lower	Upper	
1 Mean incdiff_06_10	-6551.4016	1866.13456	-10289.7184	-2813.0849	1.081

Univariate Statistics

2006 WHETHER FINANCIAL RESPONDENT	Unweighted Count
1 Mean incdiff_06_10	9402

* Adjusted Weight for Two Waves.

```
GET
  SAS DATA='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\adj_wgt_2waves.sas7bdat'.
Warning # 7251. Command name: GET SAS
One or more variable names were changed to satisfy the SPSS Statistics rules
for names.
```

* Analysis Preparation Wizard.

```
CSPLAN ANALYSIS
  /PLAN FILE='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_adj_kwgt2.csaplan'
  /PLANVARS ANALYSISWEIGHT=adj_kwgtr
  /SRSESTIMATOR TYPE=WOR
  /PRINT PLAN
  /DESIGN STRATA=STRATUM CLUSTER=SECU
  /ESTIMATOR TYPE=WR.
```

* Complex Samples Descriptives.

```
CSDESCRIPTIVES
  /PLAN FILE='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_adj_kwgt2.csaplan'
  /SUMMARY VARIABLES=incdiff_06_10
  /SUBPOP TABLE=KFINR DISPLAY=LAYERED
  /MEAN
  /STATISTICS SE CIN COUNT DEFF
  /MISSING SCOPE=LISTWISE.
```

Complex Samples: Descriptives

Univariate Statistics

	Estimate	Standard Error	95% Confidence Interval		Design Effect	Unweighted Count
			Lower	Upper		
Mean incdiff_06_10	-6119.9698	1702.96510	-9531.4188	-2708.5208	.984	9402

Subpopulation Descriptives

Univariate Statistics

		Estimate	Standard Error	95% Confidence Interval		Design Effect
				Lower	Upper	
2006 WHETHER FINANCIAL RESPONDENT						
1	Mean incdiff_06_10	-6119.9698	1702.96510	-9531.4188	-2708.5208	.984

Univariate Statistics

		Unweighted Count	
2006 WHETHER FINANCIAL RESPONDENT			
1	Mean incdiff_06_10		9402

* Calibration Method for Two Waves.

```
GET
  SAS DATA='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\calibration_2waves.sas7bdat'.
```

Warning # 7251. Command name: GET SAS
 One or more variable names were changed to satisfy the SPSS Statistics rules for names.
 DATASET NAME DataSet1 WINDOW=FRONT.

* Analysis Preparation Wizard.

```
CSPLAN ANALYSIS
  /PLAN FILE='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_calibration_2waves.csaplan'
  /PLANVARS ANALYSISWEIGHT=KWGTR_cal
  /SRSESTIMATOR TYPE=WOR
  /PRINT PLAN
  /DESIGN STRATA=STRATUM CLUSTER=SECU
  /ESTIMATOR TYPE=WR.
```

* Complex Samples Descriptives.

```
CSDSCRIPTIVES
  /PLAN FILE='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\hrs_calibration_2waves.csaplan'
  /SUMMARY VARIABLES=incdiff_06_10
  /SUBPOP TABLE=KFINR DISPLAY=LAYERED
  /MEAN
  /STATISTICS SE CIN COUNT DEFF
  /MISSING SCOPE=LISTWISE.
```

Complex Samples: Descriptives

Univariate Statistics

	Estimate	Standard Error	95% Confidence Interval		Design Effect	Unweighted Count
			Lower	Upper		
Mean incdiff_06_10	-6341.6570	1780.59942	-9908.6262	-2774.6877	1.036	9402

Subpopulation Descriptives

Univariate Statistics

		Estimate	Standard Error	95% Confidence Interval		Design Effect
				Lower	Upper	
2006 WHETHER FINANCIAL RESPONDENT						
1	Mean incdiff_06_10	-6341.6570	1780.59942	-9908.6262	-2774.6877	1.036

Univariate Statistics

			Unweighted Count
2006 WHETHER FINANCIAL RESPONDENT			
1	Mean incdiff_06_10		9402

* 4 Waves of HRS data.

* Weighted Multilevel Model.

```
GET
  SAS DATA='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\wgt_multilevel_3pwaves.sas7bdat'.
DATASET NAME DataSet1 WINDOW=FRONT.
```

```
compute revgender=3 - gender.
compute revstratum=57- stratum.
```

* Notes on this model:

Approximate weighted multilevel model with mixed linear model with stratum as model predictor, SPSS does not allow use of different weights for multiple levels in CS Commands
 Model is modified to include random effects and level1 weight but no robust SE or level 2 weights in SPSS due to lack of ability to handle these features
 This model serves as a demonstration of an approximation and is not strictly correct.

```
MIXED ln_inc BY REVGENDER REVSTRATUM WITH yrssince06 yrs06sq
  /CRITERIA=CIN(95) MXITER(100) MXSTEP(10) SCORING(1) SINGULAR(0.000000000001) HCONVERGE(0,
  ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)
  /FIXED YRSSINCE06 REVGENDER YRSSINCE06*REVGENDER YRS06SQ YRS06SQ*REVGENDER REVSTRATUM
  /RANDOM YRSSINCE06 YRS06SQ
  /METHOD=REML
  /PRINT=SOLUTION
  /REGWGT=level1wgt.
```

Mixed Model Analysis

Model Dimension^{a,b}

		Number of Levels	Covariance Structure	Number of Parameters
Fixed Effects	Intercept	1		1
	yrssince06	1		1
	Revgender	2		1
	revgender * yrssince06	2		1
	yrs06sq	1		1
	revgender * yrs06sq	2		1
	Revstratum	56		55
Random Effects	yrssince06 + yrs06sq	2	Variance Components	2
Residual				1
Total		67		64

a. Dependent Variable: ln_inc.

b. Residual is weighted by level1wgt.

Information Criteria^{a,b}

-2 Restricted Log Likelihood	135493.368
Akaike's Information Criterion (AIC)	135499.368
Hurvich and Tsai's Criterion (AICC)	135499.369
Bozdogan's Criterion (CAIC)	135528.120
Schwarz's Bayesian Criterion (BIC)	135525.120

The information criteria are displayed in smaller-is-better form.^{a,b}

a. Dependent Variable: ln_inc.

b. Residual is weighted by level1wtg.

Fixed Effects

Type III Tests of Fixed Effects^{a,b}

Source	Numerator df	Denominator df	F	Sig.
Intercept	1	39495.000	616652.813	.000
yrssince06	1	39495.000	22.186	.000
revgender	1	39495.000	553.444	.000
revgender * yrssince06	1	39495.000	.787	.375
yrs06sq	1	39495.000	38.333	.000
revgender * yrs06sq	1	39495	1.998	.157
revstratum	55	39495.000	19.217	.000

a. Dependent Variable: ln_inc.

b. Residual is weighted by level1wtg.

Estimates of Fixed Effects^{a,b}

Parameter	Estimate	Std. Error	df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Intercept	10.193536	.054630	39495.000	186.594	.000	10.086460	10.300611
yrssince06	.057366	.015413	39495.000	3.722	.000	.027156	.087576
[revgender=1.00]	-.570575	.024254	39495.000	-23.525	.000	-.618113	-.523038
[revgender=2.00]	0 ^c	0	.	.	.	.	.
[revgender=1.00] * yrssince06	-.018185	.020496	39495.000	-.887	.375	-.058358	.021988
[revgender=2.00] * yrssince06	0 ^c	0	.	.	.	.	.
yrs06sq	-.012767	.002526	39495.000	-5.054	.000	-.017718	-.007816
[revgender=1.00] * yrs06sq	.004746	.003357	39495	1.414	.157	-.001835	.011327
[revgender=2.00] * yrs06sq	0 ^c	0	.	.	.	.	.
[revstratum=1.00]	.823406	.121129	39495.000	6.798	.000	.585990	1.060823
[revstratum=2.00]	.212805	.111564	39495.000	1.907	.056	-.005863	.431472
[revstratum=3.00]	-.248137	.181099	39495.000	-1.370	.171	-.603096	.106821
[revstratum=4.00]	.600864	.136969	39495.000	4.387	.000	.332402	.869326
[revstratum=5.00]	-.642758	.083198	39495.000	-7.726	.000	-.805827	-.479689
[revstratum=6.00]	.413252	.068634	39495.000	6.021	.000	.278727	.547776
[revstratum=7.00]	.358917	.064453	39495.000	5.569	.000	.232588	.485246
[revstratum=8.00]	.237989	.068421	39495.000	3.478	.001	.103882	.372097
[revstratum=9.00]	.314640	.072483	39495.000	4.341	.000	.172572	.456708
[revstratum=10.00]	.220935	.064141	39495.000	3.445	.001	.095217	.346653
[revstratum=11.00]	.456657	.061018	39495.000	7.484	.000	.337060	.576255
[revstratum=12.00]	.622352	.062369	39495.000	9.979	.000	.500108	.744596
[revstratum=13.00]	.486190	.066146	39495.000	7.350	.000	.356543	.615837
[revstratum=14.00]	.470830	.066287	39495.000	7.103	.000	.340906	.600753
[revstratum=15.00]	.475978	.065105	39495.000	7.311	.000	.348372	.603585
[revstratum=16.00]	.561794	.065844	39495.000	8.532	.000	.432738	.690850
[revstratum=17.00]	.723051	.063516	39495.000	11.384	.000	.598558	.847543
[revstratum=18.00]	.560014	.069768	39495.000	8.027	.000	.423266	.696762
[revstratum=19.00]	.399625	.069930	39495.000	5.715	.000	.262559	.536690
[revstratum=20.00]	.251593	.075962	39495.000	3.312	.001	.102706	.400480
[revstratum=21.00]	.195657	.073677	39495.000	2.656	.008	.051248	.340065
[revstratum=22.00]	.544233	.083670	39495.000	6.505	.000	.380239	.708228
[revstratum=23.00]	-.014321	.067300	39495.000	-.213	.831	-.146231	.117589
[revstratum=24.00]	.264621	.062751	39495.000	4.217	.000	.141626	.387615
[revstratum=25.00]	.324075	.068247	39495.000	4.749	.000	.190308	.457841
[revstratum=26.00]	.530216	.064280	39495.000	8.248	.000	.404225	.656208
[revstratum=27.00]	.613787	.064293	39495.000	9.547	.000	.487772	.739802
[revstratum=28.00]	.573539	.063967	39495.000	8.966	.000	.448163	.698915
[revstratum=29.00]	.511901	.067653	39495.000	7.567	.000	.379301	.644502
[revstratum=30.00]	.648318	.065427	39495.000	9.909	.000	.520080	.776557
[revstratum=31.00]	.485452	.068279	39495.000	7.110	.000	.351624	.619280

[revstratum=32.00]	.468919	.096866	39495.000	4.841	.000	.279061	.658778
[revstratum=33.00]	.555772	.102353	39495.000	5.430	.000	.355158	.756386
[revstratum=34.00]	.486006	.093114	39495.000	5.219	.000	.303501	.668511
[revstratum=35.00]	.531222	.092498	39495.000	5.743	.000	.349925	.712520
[revstratum=36.00]	.503361	.074307	39495.000	6.774	.000	.357718	.649004
[revstratum=37.00]	-.078161	.075233	39495.000	-1.039	.299	-.225619	.069297
[revstratum=38.00]	.357038	.084517	39495.000	4.224	.000	.191382	.522694
[revstratum=39.00]	.742752	.084436	39495.000	8.797	.000	.577256	.908248
[revstratum=40.00]	.483201	.078097	39495.000	6.187	.000	.330129	.636273
[revstratum=41.00]	.321673	.090246	39495.000	3.564	.000	.144789	.498557
[revstratum=42.00]	.459584	.086998	39495.000	5.283	.000	.289066	.630103
[revstratum=43.00]	.603072	.088449	39495.000	6.818	.000	.429710	.776433
[revstratum=44.00]	.611541	.086753	39495.000	7.049	.000	.441503	.781579
[revstratum=45.00]	.241579	.081953	39495.000	2.948	.003	.080950	.402208
[revstratum=46.00]	.370638	.080710	39495.000	4.592	.000	.212445	.528831
[revstratum=47.00]	.767664	.075759	39495.000	10.133	.000	.619175	.916153
[revstratum=48.00]	.553475	.074679	39495.000	7.411	.000	.407102	.699849
[revstratum=49.00]	.442595	.068387	39495.000	6.472	.000	.308556	.576635
[revstratum=50.00]	.701016	.070793	39495.000	9.902	.000	.562260	.839772
[revstratum=51.00]	.281267	.074866	39495.000	3.757	.000	.134527	.428006
[revstratum=52.00]	.366523	.076651	39495.000	4.782	.000	.216285	.516762
[revstratum=53.00]	.375566	.078151	39495.000	4.806	.000	.222389	.528743
[revstratum=54.00]	.275429	.078811	39495.000	3.495	.000	.120957	.429901
[revstratum=55.00]	.179310	.074452	39495.000	2.408	.016	.033383	.325237
[revstratum=56.00]	0 ^c	0	.	.	.	.	.

a. Dependent Variable: ln_inc.

b. Residual is weighted by level1wt.

c. This parameter is set to zero because it is redundant.

Covariance Parameters

Estimates of Covariance Parameters^{a,b}

Parameter	Estimate	Std. Error
Residual	1.775762	.012637
yrssince06 Variance	.000000 ^c	.000000
yrs06sq Variance	.000000 ^c	.000000

a. Dependent Variable: ln_inc.

b. Residual is weighted by level1wt.

c. This covariance parameter is redundant.

* Veiga et al. (2014) not available in SPSS CS Commands.

* Weighted GEE.

```
GET
  SAS DATA='P:\ASDA 2\Data sets\HRS 2012\HRS 2006_2012 Longitudinal File\wgt_gee_3pwaves.sas7bdat'.
DATASET NAME DataSet1 WINDOW=FRONT.
```

```
compute revgender=3 - gender.
compute revstratum=57- stratum.
```

* Model results are very close to those from Stata, GENLIN allows Robust SE and STRATUM variable used as model predictor.

* Generalized Estimating Equations.

```
GENLIN ln_inc BY revgender revstratum (ORDER=ASCENDING) WITH yrssince06 yrs06sq
  /MODEL yrssince06 revgender yrs06sq yrssince06*revgender yrs06sq*revgender revstratum INTERCEPT=YES
SCALEWEIGHT=casewt
DISTRIBUTION=NORMAL LINK=IDENTITY
/CRITERIA SCALE=MLE PCONVERGE=1E-006 (ABSOLUTE) SINGULAR=1E-012 ANALYSISTYPE=3 (WALD) CILEVEL=95
  LIKELIHOOD=FULL
/REPEATED SUBJECT=newid_num SORT=YES CORRTYPE=EXCHANGEABLE ADJUSTCORR=YES COVB=ROBUST
/MISSING CLASSMISSING=EXCLUDE
/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.
```

Generalized Linear Models

Model Information

Dependent Variable	ln_inc
Probability Distribution	Normal
Link Function	Identity
Scale Weight Variable	casewt
Subject Effect	1 newid_num
Working Correlation Matrix Structure	Exchangeable

Case Processing Summary

	N	Percent
Included	40325	85.5%
Excluded	6831	14.5%
Total	47156	100.0%

Correlated Data Summary

Number of Levels	Subject Effect	newid_num	11789
Number of Subjects			11789
Number of Measurements per Subject	Minimum		1
	Maximum		4
Correlation Matrix Dimension			4

Categorical Variable Information

			N	Percent
Factor	revgender	1.00	22821	56.6%
		2.00	17504	43.4%
		Total	40325	100.0%
	revstratum	1.00	170	0.4%
		2.00	200	0.5%
		3.00	62	0.2%
		4.00	125	0.3%
		5.00	419	1.0%
		6.00	921	2.3%
		7.00	1238	3.1%
		8.00	895	2.2%
		9.00	708	1.8%
		10.00	1250	3.1%
		11.00	1698	4.2%
		12.00	1470	3.6%
		13.00	1067	2.6%
		14.00	1044	2.6%
		15.00	1097	2.7%
		16.00	1062	2.6%
		17.00	1310	3.2%
		18.00	808	2.0%
		19.00	822	2.0%
		20.00	568	1.4%
		21.00	707	1.8%
		22.00	430	1.1%
		23.00	984	2.4%
		24.00	1429	3.5%
		25.00	893	2.2%
		26.00	1207	3.0%
		27.00	1193	3.0%
		28.00	1227	3.0%
		29.00	921	2.3%
		30.00	1084	2.7%
		31.00	890	2.2%
		32.00	252	0.6%
		33.00	228	0.6%

34.00	292	0.7%
35.00	296	0.7%
36.00	635	1.6%
37.00	606	1.5%
38.00	407	1.0%
39.00	396	1.0%
40.00	533	1.3%
41.00	334	0.8%
42.00	363	0.9%
43.00	341	0.8%
44.00	350	0.9%
45.00	448	1.1%
46.00	471	1.2%
47.00	569	1.4%
48.00	618	1.5%
49.00	910	2.3%
50.00	775	1.9%
51.00	638	1.6%
52.00	577	1.4%
53.00	569	1.4%
54.00	524	1.3%
55.00	631	1.6%
56.00	663	1.6%
Total	40325	100.0%

Continuous Variable Information

		N	Minimum	Maximum	Mean	Std. Deviation
Dependent Variable	ln_inc	40325	.00	17.91	10.2688	1.41383
Covariate	yrssince06	40325	0	6	2.73	2.228
	yrs06sq	40325	0	36	12.42	13.591
Scale Weight	casewt	40325	1068	8449395	27230.1793	155257.90017

Goodness of Fit^a

	Value
Quasi Likelihood under Independence Model Criterion (QIC) ^b	2509506411.621
Corrected Quasi Likelihood under Independence Model Criterion (QICC) ^b	2509502073.623

Dependent Variable: In_inc

Model: (Intercept), yrssince06, revgender, yrs06sq, revgender * yrssince06, revgender * yrs06sq, revstratum^a

a. Information criteria are in smaller-is-better form.

b. Computed using the full log quasi-likelihood function.

Tests of Model Effects

Source	Type III		
	Wald Chi-Square	df	Sig.
(Intercept)	30891.375	1	.000
yrssince06	.795	1	.373
revgender	38.296	1	.000
yrs06sq	.001	1	.975
revgender * yrssince06	1.623	1	.203
revgender * yrs06sq	.771	1	.380
revstratum	148.647	55	.000

Dependent Variable: In_inc

Model: (Intercept), yrssince06, revgender, yrs06sq, revgender * yrssince06, revgender * yrs06sq, revstratum

Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
			(Intercept)	9.819	.4376	8.961	10.676	503.508	1	.000
yrssince06	-.087	.0476	-.180	.007	3.320	1	.068
[revgender=1.00]	-.635	.1026	-.836	-.434	38.296	1	.000
[revgender=2.00]	0 ^a	.	.	.	.	.	.
ysr06sq	.006	.0083	-.010	.022	.489	1	.484
[revgender=1.00] * yrssince06	.099	.0779	-.053	.252	1.623	1	.203
[revgender=2.00] * yrssince06	0 ^a	.	.	.	.	.	.
[revgender=1.00] * ysr06sq	-.011	.0127	-.036	.014	.771	1	.380
[revgender=2.00] * ysr06sq	0 ^a	.	.	.	.	.	.
[revstratum=1.00]	1.330	.4733	.402	2.258	7.896	1	.005
[revstratum=2.00]	.308	.5162	-.704	1.319	.355	1	.551
[revstratum=3.00]	.286	.6156	-.921	1.492	.215	1	.643
[revstratum=4.00]	.969	.4794	.029	1.908	4.082	1	.043
[revstratum=5.00]	.067	.5013	-.916	1.049	.018	1	.894
[revstratum=6.00]	.963	.4820	.018	1.908	3.990	1	.046
[revstratum=7.00]	.803	.4552	-.090	1.695	3.109	1	.078
[revstratum=8.00]	.354	.6153	-.852	1.560	.331	1	.565
[revstratum=9.00]	.933	.4566	.038	1.828	4.176	1	.041
[revstratum=10.00]	.676	.4517	-.209	1.561	2.240	1	.134
[revstratum=11.00]	1.071	.4735	.144	1.999	5.121	1	.024
[revstratum=12.00]	1.368	.4568	.473	2.264	8.968	1	.003
[revstratum=13.00]	1.156	.4623	.250	2.062	6.255	1	.012
[revstratum=14.00]	1.039	.4763	.106	1.973	4.763	1	.029
[revstratum=15.00]	.666	.4648	-.245	1.577	2.051	1	.152
[revstratum=16.00]	1.311	.5071	.317	2.305	6.681	1	.010
[revstratum=17.00]	1.413	.4549	.521	2.304	9.646	1	.002
[revstratum=18.00]	.958	.4571	.062	1.854	4.391	1	.036
[revstratum=19.00]	1.348	.5322	.305	2.391	6.417	1	.011
[revstratum=20.00]	.720	.4518	-.166	1.605	2.537	1	.111
[revstratum=21.00]	.746	.6137	-.456	1.949	1.480	1	.224
[revstratum=22.00]	1.123	.5142	.116	2.131	4.774	1	.029
[revstratum=23.00]	.385	.4540	-.505	1.275	.720	1	.396
[revstratum=24.00]	.932	.5666	-.178	2.043	2.708	1	.100
[revstratum=25.00]	1.003	.6157	-.203	2.210	2.656	1	.103
[revstratum=26.00]	1.136	.4622	.230	2.042	6.039	1	.014
[revstratum=27.00]	.971	.4739	.042	1.899	4.195	1	.041
[revstratum=28.00]	1.241	.4700	.320	2.162	6.971	1	.008
[revstratum=29.00]	.997	.4627	.090	1.904	4.642	1	.031
[revstratum=30.00]	1.218	.4638	.309	2.127	6.901	1	.009
[revstratum=31.00]	1.242	.5337	.196	2.288	5.417	1	.020

[revstratum=32.00]	.916	.4529	.028	1.803	4.089	1	.043
[revstratum=33.00]	.959	.5252	-.070	1.989	3.336	1	.068
[revstratum=34.00]	.556	.5119	-.447	1.559	1.180	1	.277
[revstratum=35.00]	1.116	.4895	.156	2.075	5.196	1	.023
[revstratum=36.00]	1.167	.4514	.283	2.052	6.686	1	.010
[revstratum=37.00]	1.072	.7330	-.365	2.508	2.137	1	.144
[revstratum=38.00]	1.064	.6607	-.231	2.359	2.595	1	.107
[revstratum=39.00]	1.393	.4915	.430	2.356	8.031	1	.005
[revstratum=40.00]	1.277	.4817	.333	2.221	7.024	1	.008
[revstratum=41.00]	.832	.4533	-.056	1.721	3.370	1	.066
[revstratum=42.00]	.801	.5083	-.195	1.797	2.482	1	.115
[revstratum=43.00]	.982	.4701	.061	1.904	4.367	1	.037
[revstratum=44.00]	1.038	.5211	.016	2.059	3.965	1	.046
[revstratum=45.00]	1.185	.5437	.120	2.251	4.752	1	.029
[revstratum=46.00]	.236	.7802	-1.293	1.765	.091	1	.762
[revstratum=47.00]	1.476	.4581	.578	2.374	10.385	1	.001
[revstratum=48.00]	.711	.5196	-.307	1.730	1.873	1	.171
[revstratum=49.00]	.922	.4785	-.015	1.860	3.717	1	.054
[revstratum=50.00]	1.469	.5121	.465	2.472	8.226	1	.004
[revstratum=51.00]	.890	.6169	-.320	2.099	2.079	1	.149
[revstratum=52.00]	.700	1.6461	-2.526	3.926	.181	1	.671
[revstratum=53.00]	-.278	1.1753	-2.581	2.026	.056	1	.813
[revstratum=54.00]	.742	.4870	-.213	1.696	2.321	1	.128
[revstratum=55.00]	.243	.4943	-.726	1.211	.241	1	.623
[revstratum=56.00]	0 ^a	.	.	.	.	.	.
(Scale)	62326.196						

Dependent Variable: ln_inc

Model: (Intercept), yrssince06, revgender, yrs06sq, revgender * yrssince06, revgender * yrs06sq, revstratum

a. Set to zero because this parameter is redundant.

* Export Output.

OUTPUT EXPORT

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