Appendices

A Code

```
%web_drop_table(WORK.IMPORT1);


FILENAME REFFILE '/home/u58265911/sasuser.v94/Life Expecttancy - My Data.xlsx';

PROC IMPORT DATAFILE=REFFILE
DBMS=XLSX
OUT=WORK.IMPORT1;
GETNAMES=YES;
RUN;

PROC CONTENTS DATA=WORK.IMPORT1; RUN;


%web_open_table(WORK.IMPORT1);

data new;
set Work.Import1 (rename=(Y=old X2=old2 X3=old3 X4=old4 X5=old5 X6= old6 X7=old7));
*had problems with data, so converted variables to numeric here;
Y = input(old, best4.);
X2 = input(old2, best.4);
X3 = input(old3, best.4);
X4 = input(old4, best.4);
X5 = input(old5, best.4);
X6 = input(old6, best.4);
X7 = input(old7, best.4);
```

```
drop old old2 old3 old4 old5 old6 old7;
format Y X2 X3 X4 X5 X6 X7 best4.;
run;
*Creating dummy variables;
data shaz;
set new;
if status='Developing' then d1=1; else d1=0;
d1x1=d1*x1;
d1x2=d1*x2;
d1x3=d1*x3;
d1x4=d1*x4;
d1x5=d1*x5;
d1x6=d1*x6;
d1x7=d1*x7;

*Sorting the data;
proc sort data=work.shaz;
by country year;
run;

*Running the PROC PANEL prodcedure using a one-way error component model;
goptions reset=all;
title1 'Panel Procedure One Way life expectancy';
proc panel data=work.shaz;
id country year;
model Y= X1 X4/ranone;
run;

*Running the PROC PANEL prodcedure using a two-way error component model;
goptions reset=all;
```

```
title1 'Panel Procedure life expectancy';
proc panel data=work.shaz plots=residualhistogram plots=qq; * Plotting residuals;
id country year;
model Y= X1 X4/ rantwo vcomp = WH;*fb wh nl;
output out=O  Residual=Res PREDICTED=Predi;
run;
proc print data=o;

*Creating scatter plot of residuals;
proc sgplot data=o;
scatter x =Predi y=Res;
run;
```

B Output

The CONTENTS Procedure

Data Set Name	WORK.IMPORT1	**Observations**	75
Member Type	DATA	**Variables**	11
Engine	V9	**Indexes**	0
Created	10/02/2021 18:24:03	**Observation Length**	80
Last Modified	10/02/2021 18:24:03	**Deleted Observations**	0
Protection		**Compressed**	NO
Data Set Type		**Sorted**	NO
Label			
Data Representation	SOLARIS_X86_64, LINUX_X86_64, ALPHA_TRU64, LINUX_IA64		
Encoding	utf-8 Unicode (UTF-8)		

Engine/Host Dependent Information	
Data Set Page Size	131072
Number of Data Set Pages	1
First Data Page	1
Max Obs per Page	1635
Obs in First Data Page	75
Number of Data Set Repairs	0
Filename	/saswork/SAS_work15D60001E4CD_odaws04-usw2.oda.sas.com/SAS_work83F60001E4CD_odaws04-usw2.oda.sas.com/import1.sas7bdat
Release Created	9.0401M6
Host Created	Linux
Inode Number	536989976
Access Permission	rw-r--r--
Owner Name	u58265911
File Size	256KB
File Size (bytes)	262144

Alphabetic List of Variables and Attributes

#	Variable	Type	Len	Format	Informat	Label
1	Country	Char	11	$11.	$11.	Country
3	Status	Char	10	$10.	$10.	Status
5	X1	Num	8	15.2		X1
6	X2	Char	5	$5.	$5.	X2
7	X3	Char	4	$4.	$4.	X3
8	X4	Char	4	$4.	$4.	X4
9	X5	Char	11	$11.	$11.	X5
10	X6	Num	8	15.2		X6
11	X7	Char	4	$4.	$4.	X7
4	Y	Char	4	$4.	$4.	Y
2	Year	Num	8	BEST.		Year

Panel Procedure One Way life expectancy

The PANEL Procedure
Fuller and Battese Variance Components (RanOne)

Dependent Variable: Y

Model Description	
Estimation Method	RanOne
Number of Cross Sections	5

Model Description	
Time Series Length	15

Fit Statistics			
SSE	195.2365	DFE	72
MSE	2.7116	Root MSE	1.6467
R-Square	0.3026		

Variance Component Estimates	
Variance Component for Cross Sections	82.70759
Variance Component for Error	2.685628

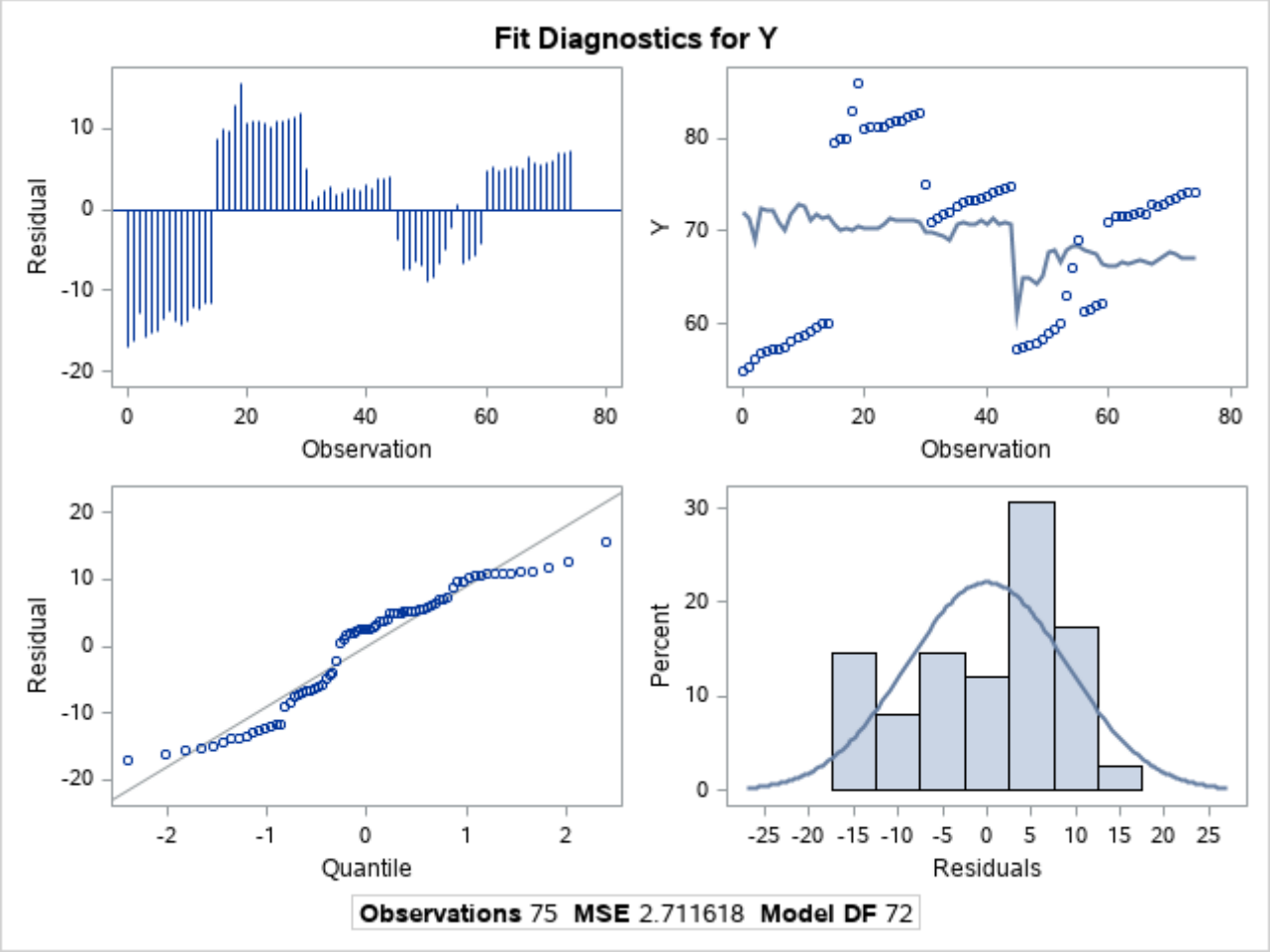
Hausman Test for Random Effects			
Coefficients	DF	m Value	Pr > m
2	2	.	.

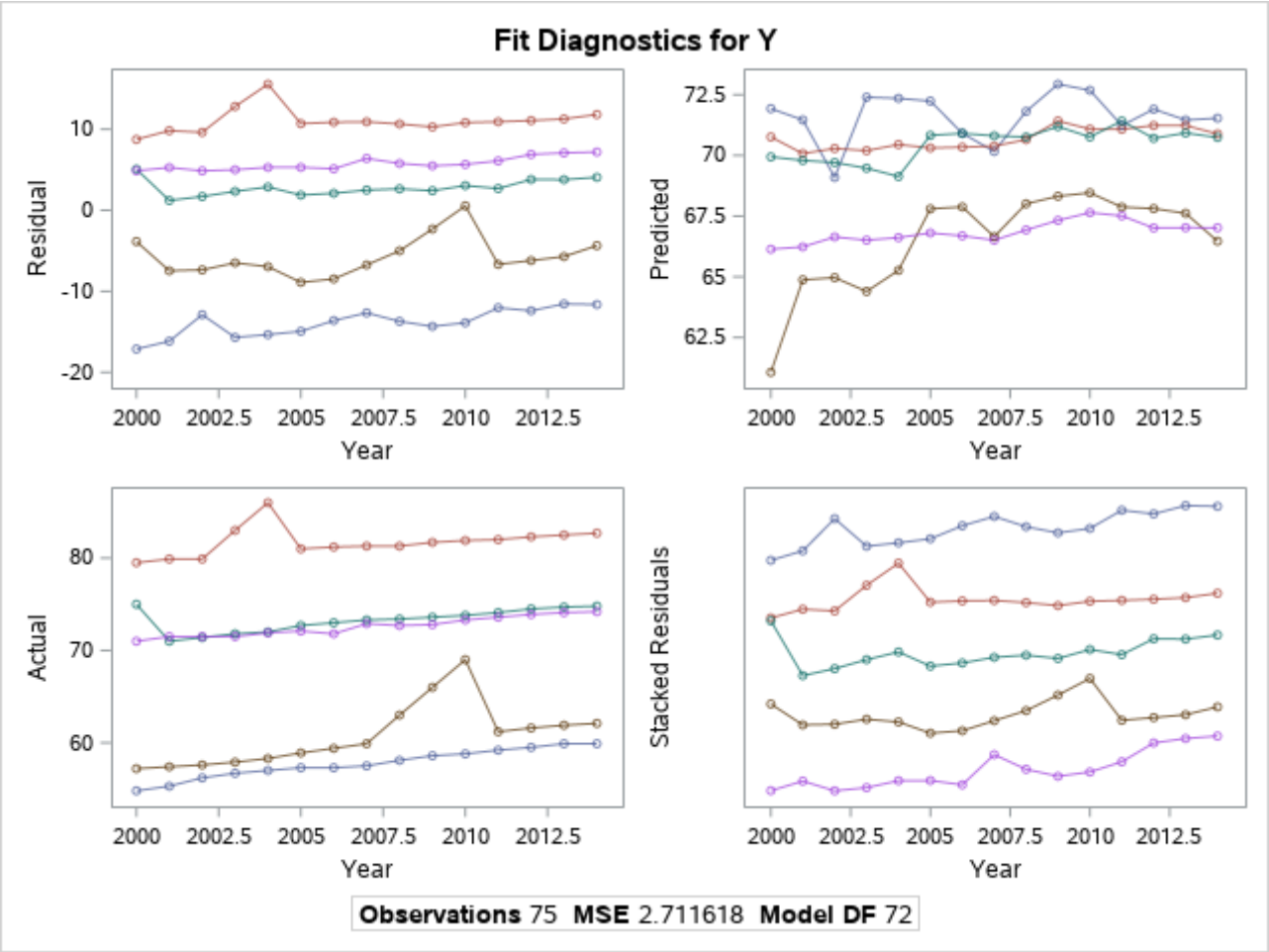
Parameter Estimates						
Variable	DF	Estimate	Standard Error	t Value	Pr > |t|	Label
Intercept	1	60.78116	4.4273	13.73	<.0001	Intercept
X1	1	0.007436	0.00314	2.37	0.0204	X1
X4	1	1.06818	0.2642	4.04	0.0001	

Panel Procedure One Way life expectancy

The PANEL Procedure
Fuller and Battese Variance Components (RanOne)

Dependent Variable: Y





Panel Procedure life expectancy

The PANEL Procedure
Wallace and Hussain Variance Components (RanTwo)

Dependent Variable: Y

Model Description	
Estimation Method	RanTwo
Number of Cross Sections	5
Time Series Length	15

Fit Statistics			
SSE	277.4733	DFE	72
MSE	3.8538	Root MSE	1.9631
R-Square	0.2263		

Variance Component Estimates	
Variance Component for Cross Sections	59.05827
Variance Component for Time Series	0.19824
Variance Component for Error	15.37574

Hausman Test for Random Effects			
Coefficients	DF	m Value	Pr > m
2	2	91.85	<.0001

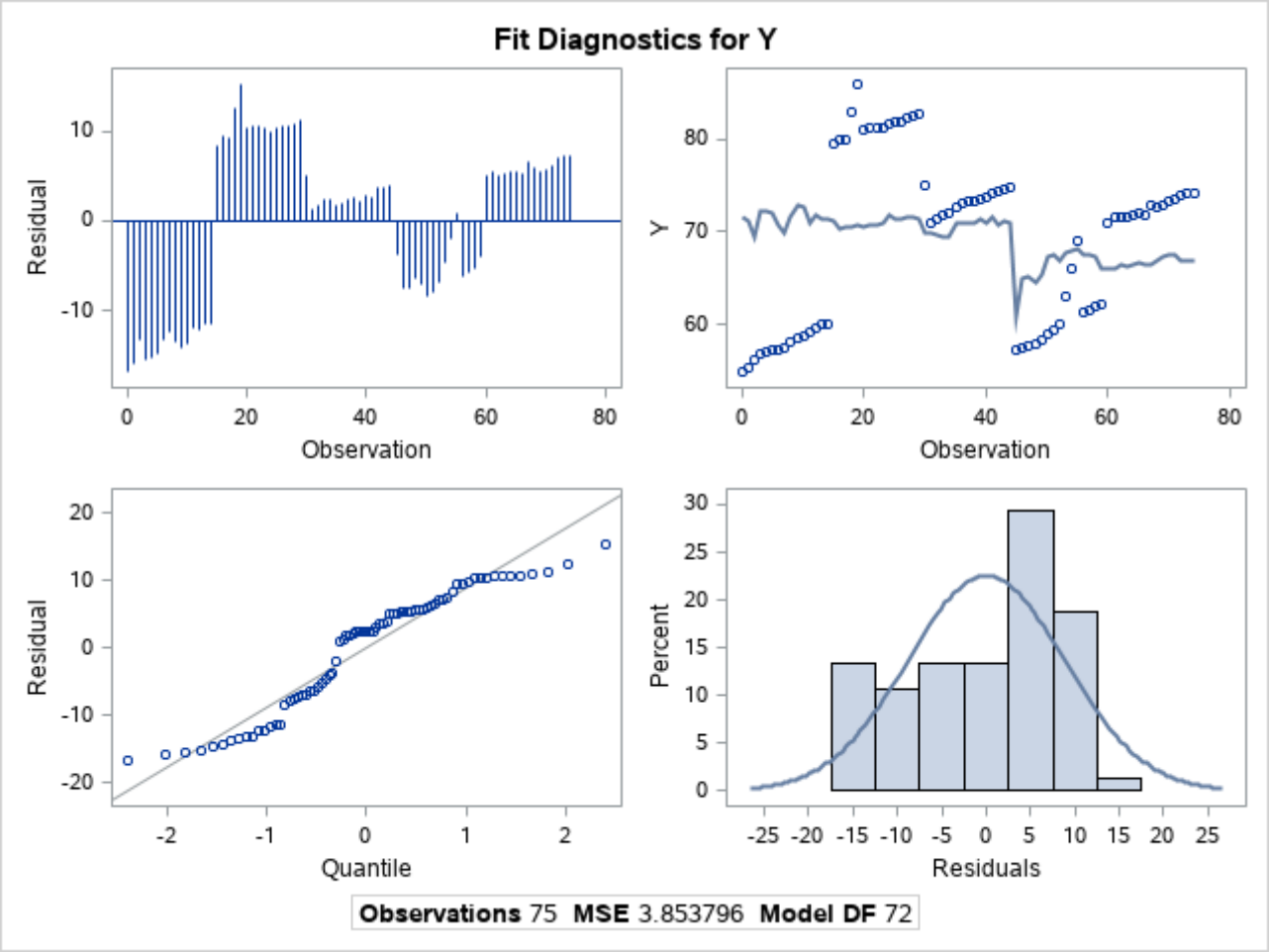
Parameter Estimates						
Variable	DF	Estimate	Standard Error	t Value	Pr > |t|	Label

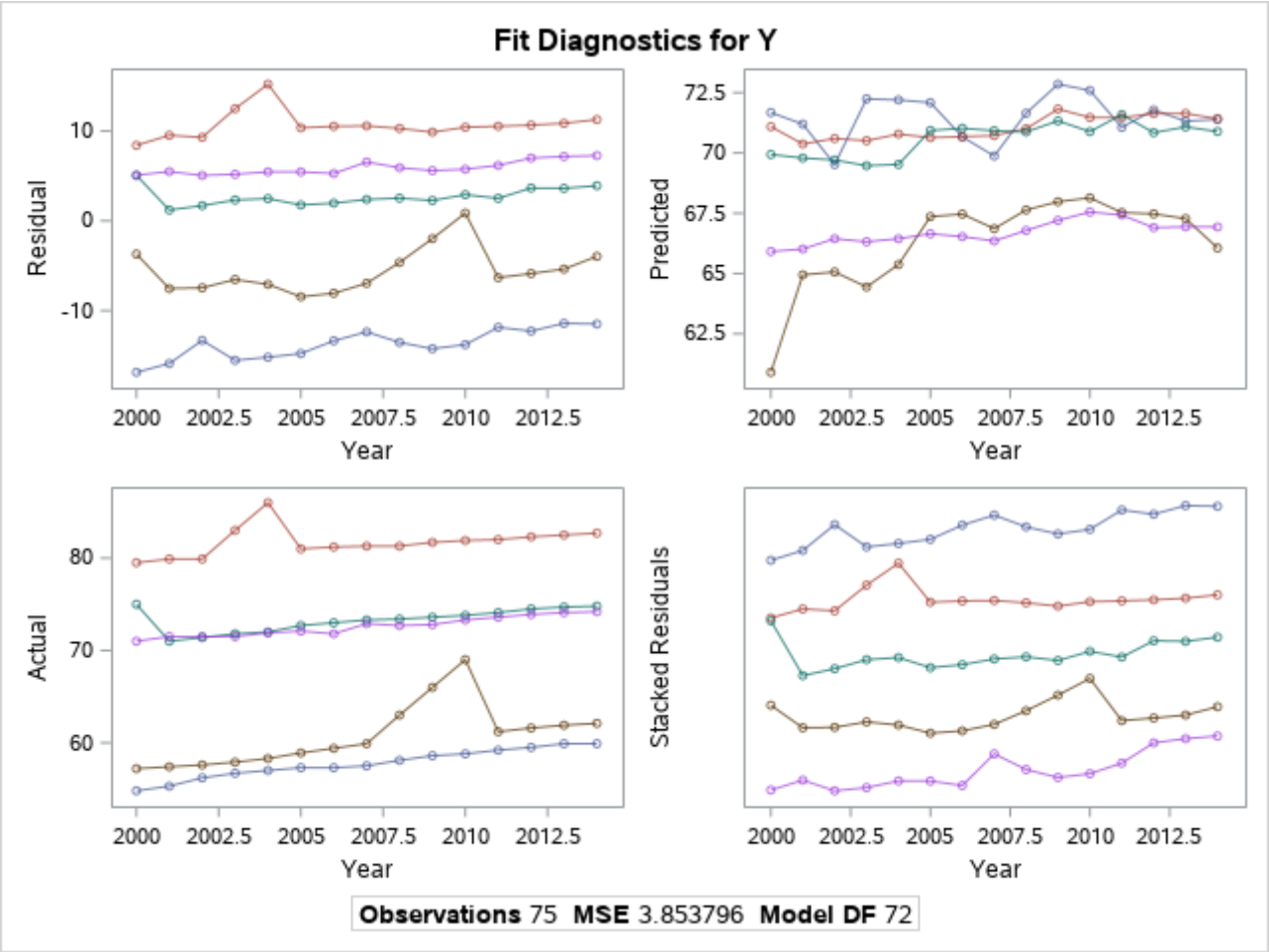
Parameter Estimates						
Variable	DF	Estimate	Standard Error	t Value	Pr > |t|	Label
Intercept	1	60.70554	2.6062	23.29	<.0001	Intercept
X1	1	0.005206	0.00370	1.41	0.1635	X1
X4	1	1.133823	0.3007	3.77	0.0003	

Panel Procedure life expectancy

The PANEL Procedure
Wallace and Hussain Variance Components (RanTwo)

Dependent Variable: Y

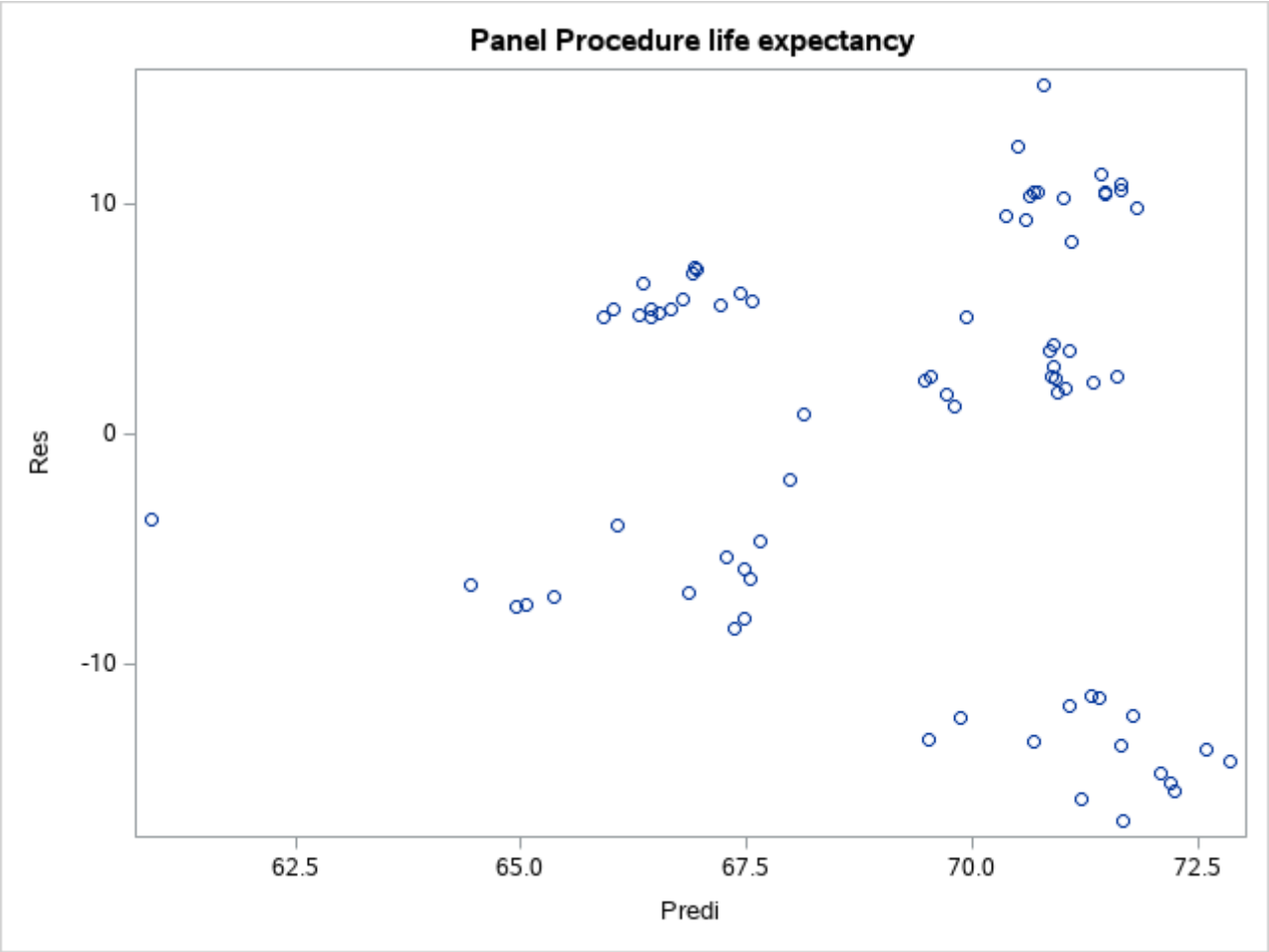




Panel Procedure life expectancy

Obs	_MODELL_	_METHOD_	_MODLNO_	_ACTUAL_	Predi	Res	_WEIGHT_	Country	Year	X1	X4
1		_Ran2WH_	1	54.8	71.6741	-16.8741	1	Afghanistan	2000	321.00	8.2
2		_Ran2WH_	1	55.3	71.1945	-15.8945	1	Afghanistan	2001	316.00	7.8
3		_Ran2WH_	1	56.2	69.5196	-13.3196	1	Afghanistan	2002	3.00	7.76
4		_Ran2WH_	1	56.7	72.2417	-15.5417	1	Afghanistan	2003	295.00	8.82
5		_Ran2WH_	1	57.0	72.1973	-15.1973	1	Afghanistan	2004	293.00	8.79
6		_Ran2WH_	1	57.3	72.0848	-14.7848	1	Afghanistan	2005	291.00	8.7
7		_Ran2WH_	1	57.3	70.6657	-13.3657	1	Afghanistan	2006	295.00	7.43
8		_Ran2WH_	1	57.5	69.8720	-12.3720	1	Afghanistan	2007	295.00	6.73
9		_Ran2WH_	1	58.1	71.6445	-13.5445	1	Afghanistan	2008	287.00	8.33
10		_Ran2WH_	1	58.6	72.8491	-14.2491	1	Afghanistan	2009	281.00	9.42
11		_Ran2WH_	1	58.8	72.5892	-13.7892	1	Afghanistan	2010	279.00	9.2
12		_Ran2WH_	1	59.2	71.0604	-11.8604	1	Afghanistan	2011	275.00	7.87
13		_Ran2WH_	1	59.5	71.7818	-12.2818	1	Afghanistan	2012	272.00	8.52
14		_Ran2WH_	1	59.9	71.3188	-11.4188	1	Afghanistan	2013	268.00	8.13
15		_Ran2WH_	1	59.9	71.3911	-11.4911	1	Afghanistan	2014	271.00	8.18
16		_Ran2WH_	1	79.5	71.0893	8.4107	1	Australia	2000	78.00	8.8
17		_Ran2WH_	1	79.9	70.3707	9.5293	1	Australia	2001	75.00	8.18
18		_Ran2WH_	1	79.9	70.5984	9.3016	1	Australia	2002	73.00	8.39
19		_Ran2WH_	1	83.0	70.5086	12.4914	1	Australia	2003	71.00	8.32
20		_Ran2WH_	1	86.0	70.7816	15.2184	1	Australia	2004	69.00	8.57
21		_Ran2WH_	1	81.0	70.6352	10.3648	1	Australia	2005	67.00	8.45
22		_Ran2WH_	1	81.2	70.6753	10.5247	1	Australia	2006	66.00	8.49
23		_Ran2WH_	1	81.3	70.7207	10.5793	1	Australia	2007	66.00	8.53
24		_Ran2WH_	1	81.3	71.0041	10.2959	1	Australia	2008	66.00	8.78

Obs	_MODELL_	_METHOD_	_MODLNO_	_ACTUAL_	Predi	Res	_WEIGHT_	Country	Year	X1	X4
25		_Ran2WH_	1	81.7	71.8205	9.8795	1	Australia	2009	66.00	9.5
26		_Ran2WH_	1	81.9	71.4699	10.4301	1	Australia	2010	64.00	9.2
27		_Ran2WH_	1	82.0	71.4647	10.5353	1	Australia	2011	63.00	9.2
28		_Ran2WH_	1	82.3	71.6357	10.6643	1	Australia	2012	61.00	9.36
29		_Ran2WH_	1	82.5	71.6357	10.8643	1	Australia	2013	61.00	9.36
30		_Ran2WH_	1	82.7	71.4174	11.2826	1	Australia	2014	6.00	9.42
31		_Ran2WH_	1	75.0	69.9352	5.0648	1	Brazil	2000	183.00	7.3
32		_Ran2WH_	1	71.0	69.7896	1.2104	1	Brazil	2001	179.00	7.19
33		_Ran2WH_	1	71.4	69.7060	1.6940	1	Brazil	2002	176.00	7.13
34		_Ran2WH_	1	71.8	69.4697	2.3303	1	Brazil	2003	172.00	6.94
35		_Ran2WH_	1	72.0	69.5245	2.4755	1	Brazil	2004	17.00	7.7
36		_Ran2WH_	1	72.7	70.9309	1.7691	1	Brazil	2005	163.00	8.27
37		_Ran2WH_	1	73.0	71.0225	1.9775	1	Brazil	2006	161.00	8.36
38		_Ran2WH_	1	73.3	70.9214	2.3786	1	Brazil	2007	159.00	8.28
39		_Ran2WH_	1	73.4	70.8708	2.5292	1	Brazil	2008	158.00	8.24
40		_Ran2WH_	1	73.6	71.3305	2.2695	1	Brazil	2009	157.00	8.65
41		_Ran2WH_	1	73.8	70.8840	2.9160	1	Brazil	2010	154.00	8.27
42		_Ran2WH_	1	74.1	71.5879	2.5121	1	Brazil	2011	152.00	8.9
43		_Ran2WH_	1	74.5	70.8414	3.6586	1	Brazil	2012	148.00	8.26
44		_Ran2WH_	1	74.7	71.0805	3.6195	1	Brazil	2013	146.00	8.48
45		_Ran2WH_	1	74.8	70.8886	3.9114	1	Brazil	2014	144.00	8.32
46		_Ran2WH_	1	57.2	60.9037	-3.7037	1	Ghana	2000	38.00	0
47		_Ran2WH_	1	57.4	64.9450	-7.5450	1	Ghana	2001	39.00	3.56
48		_Ran2WH_	1	57.6	65.0621	-7.4621	1	Ghana	2002	31.00	3.7
49		_Ran2WH_	1	57.9	64.4409	-6.5409	1	Ghana	2003	38.00	3.12
50		_Ran2WH_	1	58.3	65.3725	-7.0725	1	Ghana	2004	34.00	3.96
51		_Ran2WH_	1	58.9	67.3601	-8.4601	1	Ghana	2005	296.00	4.51
52		_Ran2WH_	1	59.4	67.4659	-8.0659	1	Ghana	2006	288.00	4.64
53		_Ran2WH_	1	59.9	66.8606	-6.9606	1	Ghana	2007	28.00	5.3
54		_Ran2WH_	1	63.0	67.6363	-4.6363	1	Ghana	2008	275.00	4.85
55		_Ran2WH_	1	66.0	67.9783	-1.9783	1	Ghana	2009	271.00	5.17
56		_Ran2WH_	1	69.0	68.1389	0.8611	1	Ghana	2010	267.00	5.33
57		_Ran2WH_	1	61.2	67.5285	-6.3285	1	Ghana	2011	263.00	4.81
58		_Ran2WH_	1	61.6	67.4746	-5.8746	1	Ghana	2012	257.00	4.79
59		_Ran2WH_	1	61.9	67.2775	-5.3775	1	Ghana	2013	254.00	4.63
60		_Ran2WH_	1	62.1	66.0591	-3.9591	1	Ghana	2014	253.00	3.56
61		_Ran2WH_	1	71.0	65.9129	5.0871	1	Mauritius	2000	177.00	3.78
62		_Ran2WH_	1	71.5	66.0149	5.4851	1	Mauritius	2001	177.00	3.87
63		_Ran2WH_	1	71.5	66.4449	5.0551	1	Mauritius	2002	179.00	4.24
64		_Ran2WH_	1	71.5	66.3168	5.1832	1	Mauritius	2003	174.00	4.15
65		_Ran2WH_	1	71.9	66.4443	5.4557	1	Mauritius	2004	168.00	4.29
66		_Ran2WH_	1	72.1	66.6484	5.4516	1	Mauritius	2005	168.00	4.47
67		_Ran2WH_	1	71.8	66.5307	5.2693	1	Mauritius	2006	165.00	4.38
68		_Ran2WH_	1	72.9	66.3512	6.5488	1	Mauritius	2007	161.00	4.24
69		_Ran2WH_	1	72.7	66.7854	5.9146	1	Mauritius	2008	166.00	4.6
70		_Ran2WH_	1	72.8	67.2049	5.5951	1	Mauritius	2009	166.00	4.97
71		_Ran2WH_	1	73.3	67.5521	5.7479	1	Mauritius	2010	163.00	5.29
72		_Ran2WH_	1	73.6	67.4240	6.1760	1	Mauritius	2011	158.00	5.2
73		_Ran2WH_	1	73.9	66.9043	6.9957	1	Mauritius	2012	154.00	4.76
74		_Ran2WH_	1	74.1	66.9359	7.1641	1	Mauritius	2013	147.00	4.82
75		_Ran2WH_	1	74.2	66.9297	7.2703	1	Mauritius	2014	148.00	4.81


Panel Procedure life expectancy
Res
10
0
-10
62.5
65.0
67.5
70.0
72.5
Predi