**Text version of AQoL 4D – AQoL 6D Transformation** (v1 CHE 23 June 2009)

This program

a) transforms AQoL 4D into AQoL 6D to predict the scores for AQoL 6D and
b) transforms AQoL 6D into AQoL 4D to get predicted scores for AQoL 4D

NOTE: This algorithm assumes that the scoring algorithms for AQoL 4D and AQoL 6D have been executed on the raw data for AQoL 4D and AQoL 6D to compute the disutility scores for the two instruments.

**Correlation of dimension disutility of AQoL 4D and AQol 6D.**

NOTE: du1 du2 du3 du4 are the dimension scores of AQoL 4D.

dud1 dud2 dud3 dud4 dud5 dud6 are dimension scores of AQoL 6D.

correlate du1 du2 du3 du4 dud1 dud2 dud3 dud4 dud5 dud6

# PART 1

**Regressing each dimension of AQoL 4D on dimensions of AQoL 6D and AQoL 6D on AQoL 4D**

**a) AQoL 4D on AQoL 6D**

reg du1 dud1 dud2 dud3 dud4 dud5 dud6
estimates store AQoL4D Dim1, title(**AQoL4D D1**)
predict du1hat
reg du2 dud1 dud2 dud3 dud4 dud5 dud6
estimates store AQoL4D Dim2, title(**AQoL4D D2**)
predict du2hat
reg du3 dud1 dud2 dud3 dud4 dud5 dud6
estimates store AQoL4D Dim3, title(**AQoL4D D3**)
predict du3hat
reg du4 dud1 dud2 dud3 dud4 dud5 dud6
estimates store AQoL4D Dim4, title(**AQoL4D D4**)
predict du4hat
reg AQoL 4D dud1 dud2 dud3 dud4 dud5 dud6
estimates store AQoL 4D Pred, title(**AQoL 4D Predicted Score**)
predict aqol4Dhat
generate AQoL 4D predErr = aqol4Dhat - AQoL 4D
generate aqol4D abspredErr = abs(aqol4D predErr)
sum aqol4D abspredErr

twoway (scatter aqol4Dhat AQoL 4D)(line NN NN)(lfit aqol4Dhat AQoL 4D),saving(AQoLpred_AQoL4D_gr)

**b) AQoL 6D on AQoL 4D**

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reg dud1 du1 du2 du3 du4 du5
predict dud1hat
estimates store AQoL6D Dim1, title(**AQoL6D D1**)
reg dud2 du1 du2 du3 du4

predict dud2hat
estimates store AQoL6D Dim2, title(**AQoL6D D2**)
reg dud3 du1 du2 du3 du4
predict dud3hat
estimates store AQoL6D Dim3, title(**AQoL6D D3**)
reg dud4 du1 du2 du3 du4
predict dud4hat
estimates store AQoL6D Dim4, title(**AQoL6D D4**)
reg dud5 du1 du2 du3 du4
predict dud5hat
estimates store AQoL6D Dim5, title(**AQoL6D D5**)
reg dud6 du1 du2 du3 du4
predict dud6hat
estimates store AQoL6D Dim6, title(**AQoL6D D6**)
reg AQoL 6D du1 du2 du3 du4
estimates store AQoL 6D_Pred, title(**AQoL 6D Predicted Score**)
predict aqol6Dhat
generate AQoL 6D predErr = aqol6Dhat - AQoL 6D
generate aqol6D abspredErr = abs(aqol6D predErr)
sum aqol6D abspredErr

twoway (scatter aqol6Dhat AQoL 4D)(line NN NN)(lfit aqol4Dhat AQoL 4D),saving(AQoLpred_AQoL4D_gr)

**Second Stage for (b).**
gen AQoL4D_Trans = ((1.04*(1-(0.841*du1hat))*(1-(0.855*du2hat))*(1-(0.931*du3hat))*(1-(0.997*du4hat)))) - 0.04)
tab AQoL4D_Trans
egen MSE_AQol4D = mean((AQoL4D_Trans - AQoL 4D)$^2$)
generate AQoL4D_pred_predErr = AQoL4D_Trans - AQoL 4D
generate AQoL4D_pred_ABSpredErr = abs(AQoL4D_pred_predErr)
sum AQoL4D_pred_ABSpredErr

**Formula for AQoL6D**
generate duaqol2_pred=(1/-0.965)*[(1+(-0.965*0.4724105*0.883251*dud1hat))*(1+(-0.965*0.4477805*0.883251*dud2hat))*(1+(-0.965*0.4788146*0.883251*dud3hat))*(1+(-0.965*0.3454342*0.883251*dud4hat))*(1+(-0.965*0.5920923*0.883251*dud5hat))*(1+(-0.965*0.637341*0.883251*dud6hat))-1]
egen MSE_AQol2Stg1= mean(duaqol2_pred - aqol2)
tab MSE_AQol2Stg1

generate duaqolld_pred=1.132181*duaqol2_pred

**First Stage Econometric Correction**
dummy variables for ranges of duaqolld
gen aqoldv1_p=0
gen aqoldv2_p=0
gen aqoldv3_p=0
gen aqoldv4_p=0
gen aqoldv5_p=0
replace aqoldv1_p=1 if duaqolld_pred>=0 & duaqolld_pred<0.25
replace aqoldv2_p=1 if duaqolld_pred>=0.25 & duaqolld_pred<0.5
replace aqoldv3_p=1 if duaqolld_pred>=0.5 & duaqolld_pred<0.75

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replace aqoldv4_p=1 if duaqolld_pred>=0.75 & duaqolld_pred<1.0
replace aqoldv5_p=1 if duaqolld_pred>=1.0

generate
DUAQoL6D_pred=duaqolld_pred^[(1.4544379)+(0.6357759*dud6hat*.70142711)+(0.470309*dud1hat*0.4468181*dud
2hat*(-4.6857753))+(0.4468181*dud2hat*0.6357759*dud6hat*(-
1.4205317))+(0.4779371*dud3hat*0.3459682*dud4hat*(-
2.2346052))+(aqoldv2_p*.42313558)+(aqoldv3_p*1.1013539)+(aqoldv4_p*2.6770203)+(aqoldv5_p*5.3075813)]
tab DUAQoL6D_pred
replace DUAQoL6D_pred = 1 + (DUAQoL6D_pred-1)*.25773196 if DUAQoL6D_pred > 1

generate Aq2Model1_predErr = DUAQoL_pred - AQoL 6D
gen Aq2Mod1_abspredErr = abs(Aq2Model1_predErr)
sum Aq2Mod1_abspredErr
label var Aq2Mod1_abspredErr "Absolute Predicted Error"

For graphs
gen Aqol1 = 1-aqol1
gen Aqol2 = 1-aqol2

twoway (scatter AQOL_pred aqol1)(line NN NN)(lfit AQOL_pred aqol1),saving(AQ1HatAq1)
twoway (scatter AQOL_pred Aqol2)(line NN NN)(lfit AQOL_pred Aqol2),saving(AQ1HatAq2)
twoway (scatter m9re_pred m9re)(line NN NN)(lfit m9re_pred m9re),saving(m9reHatm9re)
```

# PART 2

**Second Stage Econometric Correction**

```
gen EAqol1_du1 = du1hat - du1
gen EAqol1_du2 = du2hat - du2
gen EAqol1_du3 = du3hat - du3
gen EAqol1_du4 = du4hat - du4

gen EAqol2_dud1 = dud1hat - dud1
gen EAqol2_dud2 = dud2hat - dud2
gen EAqol2_dud3 = dud3hat - dud3
gen EAqol2_dud4 = dud4hat - dud4
gen EAqol2_dud5 = dud5hat - dud5
gen EAqol2_dud6 = dud6hat - dud6

quadratic terms for dimensions to put in the regression E=aAhat + bAhat_sq

gen du1hat_sq= du1hat*du1hat
gen du2hat_sq= du2hat*du2hat
gen du3hat_sq= du3hat*du3hat
gen du4hat_sq= du4hat*du4hat

gen dud1hat_sq = dud1hat*dud1hat
gen dud2hat_sq = dud2hat*dud2hat
gen dud3hat_sq = dud3hat*dud3hat
gen dud4hat_sq = dud4hat*dud4hat
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```
gen dud5hat_sq = dud5hat*dud5hat
gen dud6hat_sq = dud6hat*dud6hat
```

**the regression for Aqol4D**

```
reg EAqol1_du1 du1hat du1hat_sq
predict EAq1_du1H
reg EAqol1_du2 du2hat du2hat_sq
predict EAq1_du2H
reg EAqol1_du3 du3hat du3hat_sq
predict EAq1_du3H
reg EAqol1_du4 du4hat du4hat_sq
predict EAq1_du4H
```

# PART 3

**Third Stage Econometric Correction**

generating  A=Ahat +E for Aqol4D

```
gen du1_A_Aq1 = EAq1_du1H + du1hat
gen du2_A_Aq1 = EAq1_du2H + du2hat
gen du3_A_Aq1 = EAq1_du3H + du3hat
gen du4_A_Aq1 = EAq1_du4H + du4hat

gen A_AQOL_pred = ((1.04*((1-(0.613*0))*(1-(0.841*du2_A_Aq1))*(1-(0.855*du3_A_Aq1))*(1-
(0.931*du4_A_Aq1))*(1-(0.997*du5_A_Aq1)))) - 0.04)
egen MSE_AQol1Stg2 = mean((A_AQOL_pred -aqol1)^2)
tab MSE_AQol1Stg2
```

**Corrections for Aqol6D**

```
reg EAqol2_dud1 dud1hat dud1hat_sq
predict EAq2_du1H
reg EAqol2_dud2 dud2hat dud2hat_sq
predict EAq2_du2H
reg EAqol2_dud3 dud3hat dud3hat_sq
predict EAq2_du3H
reg EAqol2_dud4 dud4hat dud4hat_sq
predict EAq2_du4H
reg EAqol2_dud5 dud5hat dud5hat_sq
predict EAq2_du5H
reg EAqol2_dud6 dud6hat dud6hat_sq
predict EAq2_du6H

gen dud1_A_Aq2 = EAq2_du1H + dud1hat
gen dud2_A_Aq2 = EAq2_du2H + dud2hat
gen dud3_A_Aq2 = EAq2_du3H + dud3hat
gen dud4_A_Aq2 = EAq2_du4H + dud4hat
gen dud5_A_Aq2 = EAq2_du5H + dud5hat
gen dud6_A_Aq2 = EAq2_du6H + dud6hat

generate A_duaqol2_pred=(1/-0.965)*[(1+(-0.965*0.4724105*0.883251*dud1_A_Aq2))*(1+(-
0.965*0.4477805*0.883251*dud2_A_Aq2))*(1+(-0.965*0.4788146*0.883251*dud3_A_Aq2))*(1+(-
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0.965*0.3454342*0.883251*dud4_A_Aq2))*(1+(-0.965*0.5920923*0.883251*dud5_A_Aq2))*(1+(-
0.965*0.637341*0.883251*dud6_A_Aq2))-1]
egen MSE_AQol2Stg2 = mean((A_duaqol2_pred -aqol2)^2)
tab MSE_AQol2Stg2

generate duaqolld_A=1.132181*A_duaqol2_pred

dummy variables for ranges of duaqolld_A
gen aqoldv1_A=0
gen aqoldv2_A=0
gen aqoldv3_A=0
gen aqoldv4_A=0
gen aqoldv5_A=0
replace aqoldv1_A=1 if duaqolld_A>=0 & duaqolld_A<0.25
replace aqoldv2_A=1 if duaqolld_A>=0.25 & duaqolld_A<0.5
replace aqoldv3_A=1 if duaqolld_A>=0.5 & duaqolld_A<0.75
replace aqoldv4_A=1 if duaqolld_A>=0.75 & duaqolld_A<1.0
replace aqoldv5_A=1 if duaqolld_A>=1.0


generate
A_AQoL6D_pred=A_duaqol2_pred^[(1.4544379)+(0.6357759*dud6_A_Aq2*.70142711)+(0.470309*dud1_A_Aq2*0.4
468181*dud2_A_Aq2*(-4.6857753))+(0.4468181*dud2_A_Aq2*0.6357759*dud6_A_Aq2*(-
1.4205317))+(0.4779371*dud3_A_Aq2*0.3459682*dud4_A_Aq2*(-
2.2346052))+(aqoldv2_A*.42313558)+(aqoldv3_A*1.1013539)+(aqoldv4_A*2.6770203)+(aqoldv5_A*5.3075813)]
egen MSE_AAQoL6D = mean((A_AQoL6D_pred -AQoL 6D)^2)
tab MSE_AAQoL6D

twoway (scatter A_AQOL6D_pred AQoL4D)(line NN NN)(lfit A_AQOL6D_pred AQoL4D),saving(AAq1HatAq1)

Regress actual on predicted
reg AQoL 6D AAQoL6D_pred
predict AAQoL6D_predhat

reg AAQoL6D_predhat AAQoL6D_pred
predict AAQoL6D_predhat2
twoway (scatter  m9reA_predhat2 m9re)(line NN NN)(lfit m9reA_predhat m9reA_pred),saving(m9reAHat2m9re)


gen AAQoL6D_stg3 = - 0.07 + (1/0.3597)*AAQoL6D_pred

gen AAQoL6D_stg3 = - 0.07 + (1/0.3597)*AAQoL6D_pred

reg AAQoL6D_stg3 AQoL 6D

reg AAQoL 6D_stg3 AQoL 6D
twoway (scatter  AQoL 6D_pred AQoL 6D)(line NN NN)(lfit AQoL 6D_pred AQoL 6D),saving(m9repredm9re)
twoway (scatter  AAQoL 6D_pred AQoL 6D)(line NN NN)(lfit  AAQoL 6D_pred AQoL 6D),saving(m9reAhatm9re)
twoway (scatter  AAQoL 6D_stg3 AQoL 6D)(line NN NN)(lfit  AAQoL6D_stg3 AQoL 6D),saving(m9reAStg3m9re)
```