```
#delimit ;
set more off;
set linesize 79;
set mem 10M;
set matsize 800;
log using "C:\Users\Samuel R. Lucas\My Real Documents\000Haifa\coldco22.out", replace text ;
use "C:\Users\Samuel R. Lucas\My Real Documents\000Haifa\yitlong4.dta" ;
* adopath + /home/davis/hdir1/lucas/ado/stbplus ;

* This estimates a Lucas Berends Fucella Neo-Classical Education Transitions Model ;

set seed 123456789 ;

corr AGRI MANU ;

tab1 AGRI MANU ;

heckprob COLLATTE MOMED POPED POPSEI EARNT000
        SIBS BROKEN BLACK OTHERMIS
        VOCAB ARITH READ GPA12 COLTRK12
        BROKMISS POPEDMI MOMEDMI
        SIBSMISS POPINCMI
        TESTMISS GPA12MI TRAK12MI AGRI MANU,
       sel(HSGRDGED=MOMED POPED POPSEI EARNT000
        SIBS BROKEN BLACK OTHERMIS
        VOCAB ARITH READ GPA10 COLTRK10
        BROKMISS POPEDMI MOMEDMI
        SIBSMISS POPINCMI
        TESTMISS GPA10MI TRAK10MI AGRI MANU) cluster(SCHL);

listcoef, std help ;

* calculates cross product matrix of selectionY ;

matrix accum hsgged01a=MOMED POPED POPSEI EARNT000
        SIBS BROKEN BLACK OTHERMIS
        VOCAB ARITH READ GPA10 COLTRK10
        BROKMISS POPEDMI MOMEDMI
        SIBSMISS POPINCMI
        TESTMISS GPA10MI TRAK10MI MANU twoone,
        noconstant deviation ;

* calculates variance covariance matrix of selectionY ;

matrix hsgged01b=(hsgged01a/1565) ;

* calculates cross product matrix of outcomeY ;
```

```
matrix accum colatt01a=MOMED POPED POPSEI EARNT000
        SIBS BROKEN BLACK OTHERMIS
        VOCAB ARITH READ GPA12 COLTRK12
        BROKMISS POPEDMI MOMEDMI
        SIBSMISS POPINCMI
        TESTMISS GPA12MI TRAK12MI AGRI MANU oneone if HSGRDGED==1,
        noconstant deviation ;

* calculates variance covariance matrix of outcomeY ;

matrix colatt01b=(colatt01a/1444) ;

/* AGRI MANU Unconstrained rho Model for all */ ;

* So, rho is estimated ;

* These two re-did the above for selectionY because of a change in
 the specification ;

matrix accum hsgged01c=MOMED POPED POPSEI EARNT000
        SIBS BROKEN BLACK OTHERMIS
        VOCAB ARITH READ GPA10 COLTRK10
        BROKMISS POPEDMI MOMEDMI
        SIBSMISS POPINCMI
        TESTMISS GPA10MI TRAK10MI AGRI MANU twoone,
        noconstant deviation ;

matrix hsgged01d=(hsgged01c/1565) ;


* list the variance covariance matrix from the model ;

matrix list e(V) ;

* make the matrix of coefficients workable without destroying the saved results ;

matrix MyunB=e(b) ;

* double check you have the coefficients you want ;

matrix list MyunB ;

* pull out the vector of coefficients for the outcomeY ;

matrix colattunb=MyunB[1..1, 1..24] ;

* list to be sure you have the coefficients you want of outcomeY ;
```

```
matrix list colattunb ;

* pull out the vector of coefficients you want of selectionY ;
* be sure to leave rho out of this matrix ;

matrix hsggedunb=MyunB[1..1,25..48] ;

* list to check that you have the coefficients you want of selectionY ;

matrix list hsggedunb ;

* calculate the variance of outcomeY-star, the latent variable Y ;

matrix collyvar=(colattunb*colatt01b*colattunb') + 1 ;

* calculate the variance of selectionY-star, the latent variable Y ;

matrix hsggyvar=(hsggedunb*hsgged01d*hsggedunb') + 1 ;

* list the scalars you now have ;

matrix list collyvar ;
matrix list hsggyvar ;

* now comes a Kludge.  I tried and tried to automate this, but finally the
 desire to get something to work override my desire for elegance I run the
 model once, get this result, then write it in to the expression
 below ;

* This expression calculates the Y-standardized coefficients for outcomeY,
 which I then list to assure I have what I wanted ;

matrix MystdColB=(colattunb / (sqrt(1.8770845))) ;
matrix list MystdColB ;

* This expression calculates Y-standardized coefficients for selectionY,
 which I then list to assure I have what I wanted ;

matrix MystdHsgB=(hsggedunb / (sqrt(1.8077542))) ;
matrix list MystdHsgB ;

* I then pull the rho out of the coefficient matrix I earlier set aside ;

matrix Myrho=MyunB[1..1, 49..49] ;

* I list it to assure it is what I wanted ;
```

```
* You'll note I did not automate the limits I use on the matrices.  I did not
 do that because I set the model up once, and estimated it on several
 different datasets with the same structure.  So, I had little incentive to
 automate, but I might get around to doing that.  If I do, I'll send it out.
 For now, it serves as a check to assure you are doing what you want.  Yeah,
 it's a feature ;

matrix list Myrho ;

* The next to matrices calculate a difference between the standardized
 coefficients for selectionY and for outcomeY, using only the variables
 they have in common ;

matrix MysubB01=MystdHsgB[1..1,1..24] ;

matrix MystdDIFFU=MystdColB-MysubB01 ;

* I now collect the Y-standardized variables into one vector, and list it ;

matrix MyBeta=[MystdColB, MystdHsgB, Myrho] ;

matrix list MyBeta ;

matrix list MystdDIFFU ;

* This pulls the old estimated variance covariance matrix into something I
  can manipulate without over-writing it ;

matrix MyV=e(V) ;

* The next commands adjust the variance covariance matrixes so I will be
 able to calculate appropriate standard errors ;

matrix TheirVVA=MyV[1..24, 1..24] ;
matrix TheirVVB=MyV[1..24, 25..49] ;
matrix TheirVVC=MyV[25..49, 1..24] ;
matrix TheirVVD=MyV[25..49, 25..49] ;

matrix VA=TheirVVA/1.8770845 ;
matrix VB=TheirVVB/((sqrt(1.8770845))*(sqrt(1.8077542))) ;
matrix VC=TheirVVC/((sqrt(1.8770845))*(sqrt(1.8077542))) ;
matrix VD=TheirVVD/1.8077542 ;

matrix VARMULT01=[VA, VB] ;
matrix VARMULT02=[VC, VD] ;

* This command puts the matrices in the proper order ;
```

```
matrix VARMULT=[VARMULT01 \ VARMULT02] ;

matrix list VARMULT ;

matrix MyVCVBeta=VARMULT ;

* desisam puts everything together, and reposts the results.  Reposting allows
 me to use the test commands of stata to test for equality of coefficients
 across equations, within equations, and so forth ;

/* Rescales variances and covariances from estimation */ ;

program desisam3, eclass ;
      tempname vmat1 ;
      tempname bmat1 ;
      matrix `vmat1' = MyVCVBeta ;
      matrix `bmat1'=MyBeta ;
      ereturn repost V = `vmat1' ;
      ereturn repost b = `bmat1' ;
end ;

desisam3 ;

test [COLLATTE] MOMED ;
test [COLLATTE] POPED ;
test [COLLATTE] POPSEI ;
test [COLLATTE] EARNT000 ;
test [COLLATTE] SIBS ;
test [COLLATTE] BROKEN ;
test [COLLATTE] BLACK ;

test [COLLATTE=HSGRDGED]: MOMED POPED POPSEI EARNT000 ;
test [COLLATTE=HSGRDGED]: MOMED POPED SIBS BROKEN;
test [COLLATTE=HSGRDGED]: MOMED POPED EARNT000 SIBS BROKEN;
test [COLLATTE=HSGRDGED]: MOMED POPED POPSEI EARNT000 SIBS BROKEN;
test [COLLATTE=HSGRDGED]: MOMED POPED POPSEI EARNT000 SIBS BROKEN
BLACK
 OTHERMIS;

test [COLLATTE]MOMED = [HSGRDGED]MOMED ;
test [COLLATTE]POPED = [HSGRDGED]POPED ;
test [COLLATTE]POPSEI = [HSGRDGED]POPSEI ;
test [COLLATTE]EARNT000 = [HSGRDGED]EARNT000 ;
test [COLLATTE]SIBS = [HSGRDGED]SIBS ;
test [COLLATTE]BROKEN = [HSGRDGED]BROKEN ;
test [COLLATTE]BLACK = [HSGRDGED]BLACK ;
test [COLLATTE]OTHERMIS = [HSGRDGED]OTHERMIS ;
```

```
test [COLLATTE]VOCAB = [HSGRDGED]VOCAB ;
test [COLLATTE]ARITH = [HSGRDGED]ARITH ;
test [COLLATTE]READ = [HSGRDGED]READ ;
test [COLLATTE]GPA12 = [HSGRDGED]GPA10 ;
test [COLLATTE]COLTRK12 = [HSGRDGED]COLTRK10 ;
test [COLLATTE]AGRI [COLLATTE]MANU ;
test [COLLATTE]MANU ;
test [COLLATTE]AGRI ;

test [HSGRDGED]MOMED ;
test [HSGRDGED]POPED ;
test [HSGRDGED]POPSEI ;
test [HSGRDGED]EARNT000 ;
test [HSGRDGED]SIBS ;
test [HSGRDGED]BROKEN ;
test [HSGRDGED]BLACK ;
test [HSGRDGED]OTHERMIS ;
test [HSGRDGED]VOCAB ;
test [HSGRDGED]ARITH ;
test [HSGRDGED]READ ;
test [HSGRDGED]GPA10 ;
test [HSGRDGED]COLTRK10 ;

test [COLLATTE]MOMED ;
test [COLLATTE]POPED ;
test [COLLATTE]POPSEI ;
test [COLLATTE]EARNT000 ;
test [COLLATTE]SIBS ;
test [COLLATTE]BROKEN ;
test [COLLATTE]BLACK ;
test [COLLATTE]OTHERMIS ;
test [COLLATTE]VOCAB ;
test [COLLATTE]ARITH ;
test [COLLATTE]READ ;
test [COLLATTE]GPA12 ;
test [COLLATTE]COLTRK12 ;

* after using these names, I drop them all so I can use them again to estimate
 other models ;

matrix drop MyunB colattunb hsggedunb collyvar hsggyvar MystdColB MystdHsgB
    Myrho MysubB01 MystdDIFFU MyBeta MyV TheirVVA TheirVVB
    TheirVVC TheirVVD VA VB VC VD VARMULT01 VARMULT02 VARMULT MyVCVBeta
;

clear ;
```

```
exit ;
```