Stata Textbook Examples
Introductory Econometrics: A Modern Approach by Jeffrey M. Wooldridge (1st & 2d eds.)
Chapter 16 - Simultaneous Equations Models

Example 16.1: Murder Rates and Size of the Police Force

Dataset is not available

Example 16.2: Housing Expenditures and Saving

Dataset is not available

Example 16.4: Labor Supply of Married, Working Women

Dataset is not available

Example 16.4: Inflation and Openness

Dataset is not available

Example 16.5: Labor Supply of Married, Working Women

```
use http://fmwww.bc.edu/ec-p/data/wooldridge/MROZ, clear

ivreg hours (lwage = exper expersq ) educ age kidslt6 nwifeinc

Instrumental variables (2SLS) regression

      Source |       SS       df       MS              Number of obs =     428
-------------+------------------------------           F(  5,   422) =    3.44
       Model |  -516582090     5  -103316418           Prob > F      =  0.0046
    Residual |   773893110   422  1833869.93           R-squared     =       .
-------------+------------------------------           Adj R-squared =       .
       Total |   257311020   427   602601.92           Root MSE      =  1354.2

------------------------------------------------------------------------------
       hours |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lwage |   1639.556   470.5757     3.48   0.001     714.5914     2564.52
        educ |  -183.7513   59.09981    -3.11   0.002     -299.918   -67.58463
         age |  -7.806094   9.378013    -0.83   0.406    -26.23953    10.62734
```

```
     kidslt6 |  -198.1543   182.9291    -1.08   0.279      -557.72    161.4115
    nwifeinc |  -10.16959   6.614743    -1.54   0.125    -23.17154    2.832358
       _cons |   2225.662   574.5641     3.87   0.000     1096.298    3355.026
------------------------------------------------------------------------------
Instrumented:  lwage
Instruments:   educ age kidslt6 nwifeinc exper expersq
------------------------------------------------------------------------------
```

reg hours lwage educ age kidslt6 nwifeinc

```
      Source |       SS       df       MS              Number of obs =     428
-------------+------------------------------           F(  5,   422) =    3.16
       Model |  9290528.53     5  1858105.71           Prob > F      =  0.0082
    Residual |   248020491   422  587726.283           R-squared     =  0.0361
-------------+------------------------------           Adj R-squared =  0.0247
       Total |   257311020   427   602601.92           Root MSE      =  766.63

------------------------------------------------------------------------------
       hours |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lwage |    -2.0468   54.88014    -0.04   0.970    -109.9193    105.8257
        educ |  -6.621869   18.11627    -0.37   0.715    -42.23123    28.98749
         age |    .562254   5.140012     0.11   0.913    -9.540961    10.66547
     kidslt6 |  -328.8584   101.4573    -3.24   0.001    -528.2831   -129.4338
    nwifeinc |  -5.918458   3.683341    -1.61   0.109    -13.15844    1.321522
       _cons |   1523.775   305.5755     4.99   0.000     923.1353    2124.414
------------------------------------------------------------------------------
```

ivreg lwage (hours = age kidslt6 nwifeinc) educ exper expersq

```
Instrumental variables (2SLS) regression

      Source |       SS       df       MS              Number of obs =     428
-------------+------------------------------           F(  4,   423) =   19.03
       Model |  28.0618854     4  7.01547135           Prob > F      =  0.0000
    Residual |  195.265566   423  .461620723           R-squared     =  0.1257
-------------+------------------------------           Adj R-squared =  0.1174
       Total |  223.327451   427  .523015108           Root MSE      =  .67943

------------------------------------------------------------------------------
       lwage |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       hours |   .0001259   .0002546     0.49   0.621    -.0003746    .0006264
        educ |     .11033   .0155244     7.11   0.000     .0798155    .1408445
       exper |   .0345824   .0194916     1.77   0.077      -.00373    .0728947
     expersq |  -.0007058   .0004541    -1.55   0.121    -.0015983    .0001868
       _cons |  -.6557256   .3377883    -1.94   0.053    -1.319678     .008227
------------------------------------------------------------------------------
Instrumented:  hours
Instruments:   educ exper expersq age kidslt6 nwifeinc
------------------------------------------------------------------------------
```

Example 16.6: Inflation and Openness

```
use http://fmwww.bc.edu/ec-p/data/wooldridge/OPENNESS, clear

ivreg inf (open = lland) lpcinc, first

First-stage regressions
-----------------------

      Source |       SS       df       MS              Number of obs =     114
-------------+------------------------------           F(  2,   111) =   45.17
       Model |   28606.193     2  14303.0965           Prob > F      =  0.0000
    Residual |  35151.7973   111  316.682858           R-squared     =  0.4487
-------------+------------------------------           Adj R-squared =  0.4387
       Total |  63757.9902   113  564.230002           Root MSE      =  17.796

------------------------------------------------------------------------------
        open |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      lpcinc |   .5464794    1.49324     0.37   0.715    -2.412475    3.505433
       lland |  -7.567103   .8142162    -9.29   0.000    -9.180527   -5.953679
       _cons |   117.0845    15.8483     7.39   0.000     85.68007     148.489
------------------------------------------------------------------------------


Instrumental variables (2SLS) regression

      Source |       SS       df       MS              Number of obs =     114
-------------+------------------------------           F(  2,   111) =    2.79
       Model |   2009.2308     2   1004.6154           Prob > F      =  0.0657
    Residual |  63064.1909   111  568.145864           R-squared     =  0.0309
-------------+------------------------------           Adj R-squared =  0.0134
       Total |  65073.4217   113  575.870989           Root MSE      =  23.836

------------------------------------------------------------------------------
         inf |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        open |  -.3374869   .1441212    -2.34   0.021    -.6230726   -.0519012
      lpcinc |   .3758232   2.015081     0.19   0.852    -3.617194     4.36884
       _cons |   26.89934    15.4012     1.75   0.083    -3.619157    57.41784
------------------------------------------------------------------------------
Instrumented:  open
Instruments:   lpcinc lland
------------------------------------------------------------------------------
```

Example 16.7: Testing the Permanent Income Hypothesis

```
use http://fmwww.bc.edu/ec-p/data/wooldridge/CONSUMP, clear

tsset year

ivreg gc gy (r3 = L.gc L.gy L.r3)

Instrumental variables (2SLS) regression

      Source |       SS       df       MS              Number of obs =      35
-------------+------------------------------           F(  2,    32) =   33.68
       Model |  .003759528     2  .001879764           Prob > F      =  0.0000
    Residual |  .001786069    32  .000055815           R-squared     =  0.6779
-------------+------------------------------           Adj R-squared =  0.6578
       Total |  .005545597    34  .000163106           Root MSE      =  .00747

------------------------------------------------------------------------------
gc           |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
r3           |  -.0002698   .0007639    -0.35   0.726    -.0018258    .0012861
gy           |   .5826032   .0747338     7.80   0.000     .4303755    .7348309
_cons        |   .0081396    .002054     3.96   0.000     .0039557    .0123236
------------------------------------------------------------------------------
Instrumented:  r3
Instruments:   gy L.gc L.gy L.r3
------------------------------------------------------------------------------
```

Example 16.8: Effect of Prison Population on Violent Crime Rates

```
use http://fmwww.bc.edu/ec-p/data/wooldridge/PRISON, clear

tsset state year

reg gcriv cag0_14 cag15_17 cag18_24 cag25_34 cunem cblack cmetro gincpc gpolpc gpris

      Source |       SS       df       MS              Number of obs =     714
-------------+------------------------------           F( 10,   703) =    8.09
       Model |  .576975497    10   .05769755           Prob > F      =  0.0000
    Residual |  5.01453125   703  .007133046           R-squared     =  0.1032
-------------+------------------------------           Adj R-squared =  0.0904
       Total |  5.59150675   713  .007842225           Root MSE      =  .08446

------------------------------------------------------------------------------
       gcriv |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     cag0_14 |  -2483.038    1400.61    -1.77   0.077    -5232.917    266.8405
    cag15_17 |   10.79079   2.677477     4.03   0.000     5.533976    16.04759
    cag18_24 |  -.4464182   1.756685    -0.25   0.799    -3.895395    3.002558
    cag25_34 |  -4.329303   1.407631    -3.08   0.002    -7.092966    -1.56564
```

```
       cunem |   .0053237   .0027825     1.91   0.056    -.0001393    .0107867
      cblack |  -.0021635   .0358322    -0.06   0.952    -.0725144    .0681874
      cmetro |   .0018484   .0108955     0.17   0.865    -.0195432      .02324
      gincpc |   .9395616    .151253     6.21   0.000     .6425999    1.236523
      gpolpc |   .0854818   .0585893     1.46   0.145    -.0295491    .2005127
       gpris |  -.1739892   .0482266    -3.61   0.000    -.2686747   -.0793038
       _cons |   .0386684   .0335862     1.15   0.250    -.0272729    .1046097
------------------------------------------------------------------------------
```

ivreg gcriv cag0_14 cag15_17 cag18_24 cag25_34 cunem cblack cmetro gincpc gpolpc (gpris = final1 final2)

```
Instrumental variables (2SLS) regression

      Source |       SS       df       MS              Number of obs =     714
-------------+------------------------------           F( 10,   703) =    5.58
       Model | -1.48643443    10 -.148643443           Prob > F      =  0.0000
    Residual |  7.07794118   703  .010068195           R-squared     =       .
-------------+------------------------------           Adj R-squared =       .
       Total |  5.59150675   713  .007842225           Root MSE      =  .10034

------------------------------------------------------------------------------
       gcriv |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       gpris |  -.9942312   .3589068    -2.77   0.006    -1.698889   -.2895738
     cag0_14 |  -3138.017   1687.888    -1.86   0.063    -6451.922    175.8876
    cag15_17 |   5.211254   3.990898     1.31   0.192    -2.624253    13.04676
    cag18_24 |  -2.638793   2.291848    -1.15   0.250    -7.138478    1.860893
    cag25_34 |  -5.737185   1.779489    -3.22   0.001    -9.230934   -2.243436
       cunem |    .008557   .0035887     2.38   0.017     .0015112    .0156027
      cblack |   -.003239   .0425733    -0.08   0.939    -.0868251     .080347
      cmetro |  -.0045437   .0132357    -0.34   0.731      -.03053    .0214425
      gincpc |   .9112354   .1801137     5.06   0.000     .5576101    1.264861
      gpolpc |   .0641088   .0702171     0.91   0.362    -.0737516    .2019692
       _cons |   .0987133    .047591     2.07   0.038     .0052758    .1921508
------------------------------------------------------------------------------
Instrumented:  gpris
Instruments:   cag0_14 cag15_17 cag18_24 cag25_34 cunem cblack cmetro gincpc
               gpolpc final1 final2
------------------------------------------------------------------------------
```

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