```
-------------------------------------------------------------------------------
      log:
C:\Documenti\TOMMASO\lezioni\bocconi\econometria\esercitazione_emp_4\Lezione
> _info_4.log
  log type:  text
 opened on:  15 Dec 2008, 10:26:08

.
.
. /* 2.   Un primo sguardo ai dati e stima OLS dei rendimenti dell'istruzione in
presenza
>  di endogeneità */
.
. use card, clear

. des

Contains data from card.dta
  obs:         3,010
 vars:            34                          9 Dec 2008 14:04
 size:       144,480 (98.6% of memory free)
-------------------------------------------------------------------------------
-
              storage  display     value
variable name   type   format      label      variable label
-------------------------------------------------------------------------------
-
id              int    %9.0g                  person identifier
nearc2          byte   %9.0g                  =1 if near 2 yr college, 1966
nearc4          byte   %9.0g                  =1 if near 4 yr college, 1966
educ            byte   %9.0g                  years of schooling, 1976
age             byte   %9.0g                  in years
fatheduc        byte   %9.0g                  father's schooling
motheduc        byte   %9.0g                  mother's schooling
weight          float  %9.0g                  NLS sampling weight, 1976
momdad14        byte   %9.0g                  =1 if live with mom, dad at 14
sinmom14        byte   %9.0g                  =1 if with single mom at 14
step14          byte   %9.0g                  =1 if with step parent at 14
reg661          byte   %9.0g                  =1 for region 1, 1966
reg662          byte   %9.0g                  =1 for region 2, 1966
reg663          byte   %9.0g                  =1 for region 3, 1966
reg664          byte   %9.0g                  =1 for region 4, 1966
reg665          byte   %9.0g                  =1 for region 5, 1966
reg666          byte   %9.0g                  =1 for region 6, 1966
reg667          byte   %9.0g                  =1 for region 7, 1966
reg668          byte   %9.0g                  =1 for region 8, 1966
reg669          byte   %9.0g                  =1 for region 9, 1966
south66         byte   %9.0g                  =1 if in south in 1966
black           byte   %9.0g                  =1 if black
smsa            byte   %9.0g                  =1 in in SMSA, 1976
south           byte   %9.0g                  =1 if in south, 1976
smsa66          byte   %9.0g                  =1 if in SMSA, 1966
wage            int    %9.0g                  hourly wage in cents, 1976
enroll          byte   %9.0g                  =1 if enrolled in school, 1976
KWW             byte   %9.0g                  knowledge world of work score
IQ              int    %9.0g                  IQ score
married         byte   %9.0g                  =1 if married, 1976
libcrd14        byte   %9.0g                  =1 if lib. card in home at 14
exper           byte   %9.0g                  age - educ - 6
lwage           float  %9.0g                  log(wage)
expersq         int    %9.0g                  exper^2
-------------------------------------------------------------------------------
-
Sorted by:

. sum

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
          id |      3010    2581.749    1500.539          2       5225
```

```
      nearc2 |      3010    .4408638    .4965731          0          1
      nearc4 |      3010    .6820598    .4657535          0          1
        educ |      3010    13.26346    2.676913          1         18
         age |      3010     28.1196    3.137004         24         34
-------------+---------------------------------------------------------
    fatheduc |      2320    10.00345    3.720737          0         18
    motheduc |      2657    10.34814    3.179671          0         18
      weight |      3010    321185.3    170645.8      75607    1752340
    momdad14 |      3010    .7893688    .4078247          0          1
    sinmom14 |      3010    .1006645    .3009339          0          1
-------------+---------------------------------------------------------
      step14 |      3010    .0388704    .1933182          0          1
      reg661 |      3010    .0465116    .2106253          0          1
      reg662 |      3010    .1607973     .367405          0          1
      reg663 |      3010    .1956811      .39679          0          1
      reg664 |      3010    .0641196    .2450066          0          1
-------------+---------------------------------------------------------
      reg665 |      3010    .2083056     .406164          0          1
      reg666 |      3010    .0960133    .2946584          0          1
      reg667 |      3010    .1099668    .3129003          0          1
      reg668 |      3010    .0282392     .165683          0          1
      reg669 |      3010    .0903654    .2867522          0          1
-------------+---------------------------------------------------------
     south66 |      3010    .4142857    .4926801          0          1
       black |      3010    .2335548    .4231624          0          1
        smsa |      3010    .7129568    .4524571          0          1
       south |      3010    .4036545    .4907113          0          1
      smsa66 |      3010    .6495017    .4772053          0          1
-------------+---------------------------------------------------------
        wage |      3010    577.2824    262.9583        100       2404
      enroll |      3010    .0923588    .2895799          0          1
         KWW |      2963    33.54067    8.611619          4         56
          IQ |      2061    102.4498    15.42376         50        149
     married |      3003    2.271395    2.066823          1          6
-------------+---------------------------------------------------------
    libcrd14 |      2997     .674341    .4686987          0          1
       exper |      3010    8.856146    4.141672          0         23
       lwage |      3010    6.261832    .4437976    4.60517   7.784889
     expersq |      3010    95.57907    84.61831          0        529

. reg lwage educ exper expersq black smsa south reg661-reg668

      Source |       SS       df       MS              Number of obs =    3010
-------------+------------------------------           F( 14,  2995) =   91.43
       Model |  177.443249    14  12.6745178           Prob > F      =  0.0000
    Residual |  415.198395  2995  .138630516           R-squared     =  0.2994
-------------+------------------------------           Adj R-squared =  0.2961
       Total |  592.641645  3009  .196956346           Root MSE      =  .37233

------------------------------------------------------------------------------
       lwage |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        educ |   .0748085   .0034978    21.39   0.000     .0679502    .0816668
       exper |   .0848884    .006625    12.81   0.000     .0718984    .0978784
     expersq |  -.0022812   .0003166    -7.20   0.000    -.0029021   -.0016604
       black |   -.199895   .0182391   -10.96   0.000    -.2356574   -.1641326
        smsa |   .1530055   .0158862     9.63   0.000     .1218565    .1841544
       south |  -.1449271   .0258863    -5.60   0.000    -.1956838   -.0941703
      reg661 |  -.1196782   .0388267    -3.08   0.002    -.1958078   -.0435485
      reg662 |  -.0226807   .0282592    -0.80   0.422    -.0780901    .0327287
      reg663 |   .0249193    .027357     0.91   0.362    -.0287212    .0785597
      reg664 |  -.0696294   .0353943    -1.97   0.049    -.1390289   -.0002299
      reg665 |   .0023894   .0357407     0.07   0.947    -.0676893    .0724682
      reg666 |   .0112651   .0393145     0.29   0.774    -.0658209    .0883512
      reg667 |  -.0065039   .0391399    -0.17   0.868    -.0832477    .0702399
      reg668 |  -.1760208   .0463396    -3.80   0.000    -.2668815   -.0851601
       _cons |   4.744876   .0714218    66.43   0.000     4.604835    4.884917
------------------------------------------------------------------------------

. reg lwage educ exper expersq black smsa south reg661-reg668,robust
```

```
Linear regression                                       Number of obs =    3010
                                                        F( 14,  2995) =   97.71
                                                        Prob > F      =  0.0000
                                                        R-squared     =  0.2994
                                                        Root MSE      =  .37233

------------------------------------------------------------------------------
             |               Robust
       lwage |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        educ |   .0748085   .0036469    20.51   0.000     .0676579    .0819591
       exper |   .0848884   .0067528    12.57   0.000     .0716479     .098129
     expersq |  -.0022812   .0003195    -7.14   0.000    -.0029076   -.0016549
       black |   -.199895   .0181608   -11.01   0.000    -.2355039   -.1642861
        smsa |   .1530055   .0152713    10.02   0.000     .1230621    .1829488
       south |  -.1449271    .027837    -5.21   0.000    -.1995086   -.0903455
      reg661 |  -.1196782   .0387619    -3.09   0.002    -.1956808   -.0436755
      reg662 |  -.0226807   .0299024    -0.76   0.448    -.0813119    .0359506
      reg663 |   .0249193    .028429     0.88   0.381     -.030823    .0806616
      reg664 |  -.0696294   .0365776    -1.90   0.057    -.1413491    .0020903
      reg665 |   .0023894   .0382367     0.06   0.950    -.0725834    .0773623
      reg666 |   .0112651   .0403494     0.28   0.780    -.0678502    .0903804
      reg667 |  -.0065039   .0411359    -0.16   0.874    -.0871614    .0741535
      reg668 |  -.1760208   .0469981    -3.75   0.000    -.2681727   -.0838689
       _cons |   4.744876   .0745911    63.61   0.000     4.598621    4.891131
------------------------------------------------------------------------------

.
.
. /* 3.   Usare i test IQ/KWW per controllare per l'abilità non osservata */
.
. reg lwage educ exper expersq black smsa south reg661-reg668 IQ

      Source |       SS       df       MS              Number of obs =    2061
-------------+------------------------------           F( 15,  2045) =   42.11
       Model |  84.8712766    15  5.65808511           Prob > F      =  0.0000
    Residual |  274.749983  2045   .13435207           R-squared     =  0.2360
-------------+------------------------------           Adj R-squared =  0.2304
       Total |   359.62126  2060  .174573427           Root MSE      =  .36654

------------------------------------------------------------------------------
       lwage |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        educ |   .0698899   .0048613    14.38   0.000     .0603562    .0794235
       exper |   .0943435   .0095017     9.93   0.000     .0757094    .1129775
     expersq |  -.0026931   .0004901    -5.50   0.000    -.0036542   -.0017321
       black |  -.1464741   .0265229    -5.52   0.000    -.1984888   -.0944594
        smsa |   .1450325   .0192299     7.54   0.000     .1073202    .1827448
       south |  -.0999171   .0318179    -3.14   0.002    -.1623159   -.0375183
      reg661 |  -.1233729   .0441751    -2.79   0.005    -.2100058   -.0367401
      reg662 |  -.0200627   .0317789    -0.63   0.528    -.0823852    .0422597
      reg663 |   .0021024   .0309489     0.07   0.946    -.0585922     .062797
      reg664 |  -.0823199   .0396372    -2.08   0.038    -.1600535   -.0045864
      reg665 |  -.0034308    .042643    -0.08   0.936     -.087059    .0801974
      reg666 |   .0276218   .0505745     0.55   0.585    -.0715611    .1268048
      reg667 |  -.0365934   .0473832    -0.77   0.440    -.1295177     .056331
      reg668 |  -.1709237   .0516894    -3.31   0.001    -.2722931   -.0695544
          IQ |   .0024997   .0006766     3.69   0.000     .0011728    .0038265
       _cons |   4.509589   .1058512    42.60   0.000     4.302001    4.717176
------------------------------------------------------------------------------

. corr educ IQ
(obs=2061)

             |     educ       IQ
-------------+------------------
        educ |   1.0000
          IQ |   0.5103   1.0000
```

```
. reg educ IQ

      Source |       SS       df       MS              Number of obs =    2061
-------------+------------------------------           F(  1,  2059) =  724.90
       Model |  2774.09596     1  2774.09596           Prob > F      =  0.0000
    Residual |  7879.48288  2059  3.82684938           R-squared     =  0.2604
-------------+------------------------------           Adj R-squared =  0.2600
       Total |  10653.5788  2060  5.17164022           Root MSE      =  1.9562

------------------------------------------------------------------------------
        educ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          IQ |    .075238   .0027945    26.92   0.000     .0697577    .0807182
       _cons |   6.214256   .2895159    21.46   0.000     5.646481     6.78203
------------------------------------------------------------------------------

.
. ivregress 2sls lwage educ exper expersq black smsa south reg661-reg668 (IQ=KWW)

Instrumental variables (2SLS) regression              Number of obs =    2040
                                                      Wald chi2(15) =  570.54
                                                      Prob > chi2   =  0.0000
                                                      R-squared     =  0.1373
                                                      Root MSE      =  .38794

------------------------------------------------------------------------------
       lwage |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          IQ |   .0135233   .0026949     5.02   0.000     .0082414    .0188053
        educ |   .0416377   .0085007     4.90   0.000     .0249766    .0582988
       exper |   .1036692    .010326    10.04   0.000     .0834306    .1239079
     expersq |  -.0029621   .0005236    -5.66   0.000    -.0039884   -.0019358
       black |   .0124777   .0469659     0.27   0.790    -.0795737    .1045292
        smsa |   .1275404   .0208317     6.12   0.000     .0867111    .1683698
       south |  -.1008459   .0338025    -2.98   0.003    -.1670977   -.0345942
      reg661 |  -.1610316   .0480263    -3.35   0.001    -.2551614   -.0669017
      reg662 |  -.0543146   .0350294    -1.55   0.121    -.1229709    .0143418
      reg663 |  -.0196881   .0336434    -0.59   0.558     -.085628    .0462518
      reg664 |   -.108312   .0428255    -2.53   0.011    -.1922485   -.0243755
      reg665 |    .006201   .0453076     0.14   0.891    -.0826003    .0950023
      reg666 |    .042319   .0538681     0.79   0.432    -.0632606    .1478986
      reg667 |  -.0171336   .0504061    -0.34   0.734    -.1159278    .0816605
      reg668 |  -.1480997   .0549194    -2.70   0.007    -.2557397   -.0404597
       _cons |   3.717398    .215949    17.21   0.000     3.294146     4.14065
------------------------------------------------------------------------------
Instrumented:  IQ
Instruments:   educ exper expersq black smsa south reg661 reg662 reg663
               reg664 reg665 reg666 reg667 reg668 KWW

. reg IQ KWW educ exper expersq black smsa south reg661-reg668

      Source |       SS       df       MS              Number of obs =    2040
-------------+------------------------------           F( 15,  2024) =  108.29
       Model |  216206.941    15   14413.796           Prob > F      =  0.0000
    Residual |   269395.02  2024  133.100306           R-squared     =  0.4452
-------------+------------------------------           Adj R-squared =  0.4411
       Total |   485601.96  2039   238.15692           Root MSE      =  11.537

------------------------------------------------------------------------------
          IQ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         KWW |   .5392749   .0432196    12.48   0.000     .4545155    .6240344
        educ |   1.481811   .1689768     8.77   0.000     1.150424    1.813198
       exper |  -1.736104   .3072207    -5.65   0.000    -2.338606   -1.133603
     expersq |     .04454   .0155166     2.87   0.004     .0141099    .0749702
       black |  -11.35339    .820367   -13.84   0.000    -12.96224   -9.744539
        smsa |   .8689006   .6096389     1.43   0.154    -.3266847    2.064486
       south |  -.1079391   1.005186    -0.11   0.914    -2.079246    1.863368
      reg661 |   2.373755   1.399579     1.70   0.090    -.3710103    5.118521
```

```
      reg662 |   2.979055   1.002418     2.97   0.003     1.013176    4.944933
      reg663 |   1.927618   .9799799     1.97   0.049     .0057431    3.849492
      reg664 |   2.441654   1.254259     1.95   0.052    -.0181188    4.901428
      reg665 |  -.4697596   1.347798    -0.35   0.727    -3.112977    2.173457
      reg666 |  -1.053535   1.602777    -0.66   0.511      -4.1968    2.089729
      reg667 |  -1.100317   1.496159    -0.74   0.462     -4.03449    1.833855
      reg668 |  -2.085107   1.629118    -1.28   0.201     -5.28003    1.109816
       _cons |   73.55572    2.99119    24.59   0.000     67.68959    79.42186
------------------------------------------------------------------------------

.
. ivregress 2sls lwage educ exper expersq black smsa south reg661-reg668 (IQ=KWW),first

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

                                                Number of obs   =       2040
                                                F(  15,   2024) =     108.29
                                                Prob > F        =     0.0000
                                                R-squared       =     0.4452
                                                Adj R-squared   =     0.4411
                                                Root MSE        =    11.5369

------------------------------------------------------------------------------
          IQ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        educ |   1.481811   .1689768     8.77   0.000     1.150424    1.813198
       exper |  -1.736104   .3072207    -5.65   0.000    -2.338606   -1.133603
     expersq |     .04454   .0155166     2.87   0.004     .0141099    .0749702
       black |  -11.35339    .820367   -13.84   0.000    -12.96224   -9.744539
        smsa |   .8689006   .6096389     1.43   0.154    -.3266847    2.064486
       south |  -.1079391   1.005186    -0.11   0.914    -2.079246    1.863368
      reg661 |   2.373755   1.399579     1.70   0.090    -.3710103    5.118521
      reg662 |   2.979055   1.002418     2.97   0.003     1.013176    4.944933
      reg663 |   1.927618   .9799799     1.97   0.049     .0057431    3.849492
      reg664 |   2.441654   1.254259     1.95   0.052    -.0181188    4.901428
      reg665 |  -.4697596   1.347798    -0.35   0.727    -3.112977    2.173457
      reg666 |  -1.053535   1.602777    -0.66   0.511      -4.1968    2.089729
      reg667 |  -1.100317   1.496159    -0.74   0.462     -4.03449    1.833855
      reg668 |  -2.085107   1.629118    -1.28   0.201     -5.28003    1.109816
         KWW |   .5392749   .0432196    12.48   0.000     .4545155    .6240344
       _cons |   73.55572    2.99119    24.59   0.000     67.68959    79.42186
------------------------------------------------------------------------------


Instrumental variables (2SLS) regression              Number of obs =    2040
                                                      Wald chi2(15) =  570.54
                                                      Prob > chi2   =  0.0000
                                                      R-squared     =  0.1373
                                                      Root MSE      =  .38794

------------------------------------------------------------------------------
       lwage |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          IQ |   .0135233   .0026949     5.02   0.000     .0082414    .0188053
        educ |   .0416377   .0085007     4.90   0.000     .0249766    .0582988
       exper |   .1036692    .010326    10.04   0.000     .0834306    .1239079
     expersq |  -.0029621   .0005236    -5.66   0.000    -.0039884   -.0019358
       black |   .0124777   .0469659     0.27   0.790    -.0795737    .1045292
        smsa |   .1275404   .0208317     6.12   0.000     .0867111    .1683698
       south |  -.1008459   .0338025    -2.98   0.003    -.1670977   -.0345942
      reg661 |  -.1610316   .0480263    -3.35   0.001    -.2551614   -.0669017
      reg662 |  -.0543146   .0350294    -1.55   0.121    -.1229709    .0143418
      reg663 |  -.0196881   .0336434    -0.59   0.558     -.085628    .0462518
      reg664 |   -.108312   .0428255    -2.53   0.011    -.1922485   -.0243755
      reg665 |    .006201   .0453076     0.14   0.891    -.0826003    .0950023
      reg666 |    .042319   .0538681     0.79   0.432    -.0632606    .1478986
      reg667 |  -.0171336   .0504061    -0.34   0.734    -.1159278    .0816605
      reg668 |  -.1480997   .0549194    -2.70   0.007    -.2557397   -.0404597
       _cons |   3.717398    .215949    17.21   0.000     3.294146     4.14065
```

```
------------------------------------------------------------------------------
Instrumented:  IQ
Instruments:   educ exper expersq black smsa south reg661 reg662 reg663
               reg664 reg665 reg666 reg667 reg668 KWW

. estat firststage


Instrumental variables (2SLS) regression

      Source |       SS       df       MS              Number of obs =    2040
-------------+------------------------------           F( 15,  2024) =  108.29
       Model |  216206.941    15   14413.796           Prob > F      =  0.0000
    Residual |   269395.02  2024  133.100306           R-squared     =  0.4452
-------------+------------------------------           Adj R-squared =  0.4411
       Total |   485601.96  2039   238.15692           Root MSE      =  11.537

------------------------------------------------------------------------------
          IQ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        educ |   1.481811   .1689768     8.77   0.000     1.150424    1.813198
       exper |  -1.736104   .3072207    -5.65   0.000    -2.338606   -1.133603
     expersq |     .04454   .0155166     2.87   0.004     .0141099    .0749702
       black |  -11.35339    .820367   -13.84   0.000    -12.96224   -9.744539
        smsa |   .8689006   .6096389     1.43   0.154    -.3266847    2.064486
       south |  -.1079391   1.005186    -0.11   0.914    -2.079246    1.863368
      reg661 |   2.373755   1.399579     1.70   0.090    -.3710103    5.118521
      reg662 |   2.979055   1.002418     2.97   0.003     1.013176    4.944933
      reg663 |   1.927618   .9799799     1.97   0.049     .0057431    3.849492
      reg664 |   2.441654   1.254259     1.95   0.052    -.0181188    4.901428
      reg665 |  -.4697596   1.347798    -0.35   0.727    -3.112977    2.173457
      reg666 |  -1.053535   1.602777    -0.66   0.511      -4.1968    2.089729
      reg667 |  -1.100317   1.496159    -0.74   0.462     -4.03449    1.833855
      reg668 |  -2.085107   1.629118    -1.28   0.201     -5.28003    1.109816
         KWW |   .5392749   .0432196    12.48   0.000     .4545155    .6240344
       _cons |   73.55572    2.99119    24.59   0.000     67.68959    79.42186
------------------------------------------------------------------------------
(no endogenous regressors)

 ( 1)  KWW = 0

       F(  1,  2024) =  155.69
            Prob > F =    0.0000

  First-stage regression summary statistics
  --------------------------------------------------------------------------
               |           Adjusted      Partial
      Variable |   R-sq.       R-sq.        R-sq.     F(1,2024)   Prob > F
  -------------+------------------------------------------------------------
            IQ |  0.4452      0.4411       0.0714        155.69    0.0000
  --------------------------------------------------------------------------


  Minimum eigenvalue statistic = 155.69

  Critical Values                       # of endogenous regressors:    1
  Ho: Instruments are weak              # of excluded instruments:     1
  ---------------------------------------------------------------------
                                      |    5%     10%     20%     30%
  2SLS relative bias                  |         (not available)
  ------------------------------------+--------------------------------
                                      |   10%     15%     20%     25%
  2SLS Size of nominal 5% Wald test   |  16.38    8.96    6.66    5.53
  LIML Size of nominal 5% Wald test   |  16.38    8.96    6.66    5.53
  ---------------------------------------------------------------------


. capture estat overid

.
```

```
.
. /* 4.   Usare la distanza dall'università come strumento per l'istruzione */
.
. table nearc4,c(m educ)

----------------------
=1 if     |
near 4 yr |
college,  |
1966      | mean(educ)
----------+-----------
        0 |   12.69801
        1 |   13.52703
----------------------

. table nearc2,c(m educ)

----------------------
=1 if     |
near 2 yr |
college,  |
1966      | mean(educ)
----------+-----------
        0 |   13.15092
        1 |   13.40618
----------------------

. table nearc4,c(m wage)

----------------------
=1 if     |
near 4 yr |
college,  |
1966      | mean(wage)
----------+-----------
        0 |   516.4567
        1 |   605.6362
----------------------

. table nearc2,c(m wage)

----------------------
=1 if     |
near 2 yr |
college,  |
1966      | mean(wage)
----------+-----------
        0 |   550.2733
        1 |   611.5373
----------------------

.
. ivregress 2sls lwage exper expersq black smsa south reg661-reg668 (educ=nearc4),first

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

                                                Number of obs   =       3010
                                                F(  14,   2995) =     195.20
                                                Prob > F        =     0.0000
                                                R-squared       =     0.4771
                                                Adj R-squared   =     0.4747
                                                Root MSE        =     1.9402

------------------------------------------------------------------------------
        educ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       exper |  -.4125245   .0336943   -12.24   0.000    -.4785909   -.3464582
     expersq |   .0008743   .0016499     0.53   0.596    -.0023608    .0041095
       black |  -.9367145   .0935907   -10.01   0.000    -1.120223   -.7532059
```

```
        smsa |   .4164757   .0863879     4.82   0.000       .24709    .5858614
       south |  -.0488006   .1349033    -0.36   0.718    -.3133131    .2157118
      reg661 |  -.2116759    .202341    -1.05   0.296    -.6084173    .1850654
      reg662 |  -.2897803   .1472718    -1.97   0.049    -.5785443   -.0010162
      reg663 |  -.2388597   .1425878    -1.68   0.094    -.5184395    .0407202
      reg664 |  -.0984752    .184605    -0.53   0.594    -.4604405    .2634902
      reg665 |  -.4887188   .1865946    -2.62   0.009    -.8545853   -.1228523
      reg666 |  -.5213427   .2067818    -2.52   0.012    -.9267914   -.1158939
      reg667 |  -.4313861   .2048134    -2.11   0.035    -.8329752   -.0297969
      reg668 |   .3133879    .241634     1.30   0.195    -.1603975    .7871732
      nearc4 |   .3259587   .0841731     3.87   0.000     .1609158    .4910015
       _cons |   16.85243   .2104656    80.07   0.000     16.43976     17.2651
------------------------------------------------------------------------------

Instrumental variables (2SLS) regression              Number of obs =    3010
                                                      Wald chi2(14) =  736.22
                                                      Prob > chi2   =  0.0000
                                                      R-squared     =  0.2051
                                                      Root MSE      =   .3956

------------------------------------------------------------------------------
       lwage |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        educ |   .1450241   .0526518     2.75   0.006     .0418284    .2482197
       exper |    .113855   .0227814     5.00   0.000     .0692043    .1585057
     expersq |  -.0023426   .0003395    -6.90   0.000    -.0030081   -.0016771
       black |  -.1349735   .0522845    -2.58   0.010    -.2374493   -.0324977
        smsa |   .1165724   .0320554     3.64   0.000     .0537451    .1793998
       south |  -.1419667   .0275931    -5.15   0.000    -.1960481   -.0878852
      reg661 |  -.1059741   .0425076    -2.49   0.013    -.1892875   -.0226607
      reg662 |  -.0037634   .0331924    -0.11   0.910    -.0688193    .0612925
      reg663 |   .0432015   .0321228     1.34   0.179    -.0197581    .1061611
      reg664 |  -.0605029   .0382208    -1.58   0.113    -.1354143    .0144085
      reg665 |   .0408244   .0476293     0.86   0.391    -.0525273     .134176
      reg666 |   .0561324    .053583     1.05   0.295    -.0488884    .1611532
      reg667 |   .0294651   .0495302     0.59   0.552    -.0676123    .1265426
      reg668 |  -.1952974   .0513034    -3.81   0.000    -.2958503   -.0947445
       _cons |   3.548957   .8977478     3.95   0.000     1.789403     5.30851
------------------------------------------------------------------------------
Instrumented:  educ
Instruments:   exper expersq black smsa south reg661 reg662 reg663 reg664
               reg665 reg666 reg667 reg668 nearc4

. estat firststage


Instrumental variables (2SLS) regression

      Source |       SS       df       MS              Number of obs =    3010
-------------+------------------------------           F( 14,  2995) =  195.20
       Model |  10287.3994    14   734.81424           Prob > F      =  0.0000
    Residual |  11274.6807  2995  3.76450107           R-squared     =  0.4771
-------------+------------------------------           Adj R-squared =  0.4747
       Total |  21562.0801  3009  7.16586243           Root MSE      =  1.9402

------------------------------------------------------------------------------
        educ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       exper |  -.4125245   .0336943   -12.24   0.000    -.4785909   -.3464582
     expersq |   .0008743   .0016499     0.53   0.596    -.0023608    .0041095
       black |  -.9367145   .0935907   -10.01   0.000    -1.120223   -.7532059
        smsa |   .4164757   .0863879     4.82   0.000       .24709    .5858614
       south |  -.0488006   .1349033    -0.36   0.718    -.3133131    .2157118
      reg661 |  -.2116759    .202341    -1.05   0.296    -.6084173    .1850654
      reg662 |  -.2897803   .1472718    -1.97   0.049    -.5785443   -.0010162
      reg663 |  -.2388597   .1425878    -1.68   0.094    -.5184395    .0407202
      reg664 |  -.0984752    .184605    -0.53   0.594    -.4604405    .2634902
      reg665 |  -.4887188   .1865946    -2.62   0.009    -.8545853   -.1228523
      reg666 |  -.5213427   .2067818    -2.52   0.012    -.9267914   -.1158939
```

```
      reg667 |  -.4313861   .2048134    -2.11   0.035    -.8329752   -.0297969
      reg668 |   .3133879    .241634     1.30   0.195    -.1603975    .7871732
      nearc4 |   .3259587   .0841731     3.87   0.000     .1609158    .4910015
       _cons |   16.85243   .2104656    80.07   0.000     16.43976     17.2651
------------------------------------------------------------------------------
(no endogenous regressors)

 ( 1)  nearc4 = 0

       F(  1,  2995) =   15.00
            Prob > F =    0.0001

  First-stage regression summary statistics
  --------------------------------------------------------------------------
               |           Adjusted      Partial
      Variable |   R-sq.       R-sq.        R-sq.     F(1,2995)   Prob > F
  -------------+------------------------------------------------------------
          educ |  0.4771      0.4747       0.0050       14.9961    0.0001
  --------------------------------------------------------------------------


  Minimum eigenvalue statistic = 14.9961

  Critical Values                       # of endogenous regressors:    1
  Ho: Instruments are weak              # of excluded instruments:     1
  ---------------------------------------------------------------------
                                      |    5%     10%     20%     30%
  2SLS relative bias                  |         (not available)
  ------------------------------------+----------------------------------
                                      |   10%     15%     20%     25%
  2SLS Size of nominal 5% Wald test   |  16.38    8.96    6.66    5.53
  LIML Size of nominal 5% Wald test   |  16.38    8.96    6.66    5.53
  ---------------------------------------------------------------------


. ivregress 2sls lwage exper expersq black smsa south reg661-reg668 (educ=nearc2),first

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

                                                Number of obs   =       3010
                                                F(  14,   2995) =     193.58
                                                Prob > F        =     0.0000
                                                R-squared       =     0.4750
                                                Adj R-squared   =     0.4726
                                                Root MSE        =     1.9441

------------------------------------------------------------------------------
        educ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       exper |  -.4122819   .0337615   -12.21   0.000      -.47848   -.3460838
     expersq |   .0008447   .0016533     0.51   0.609     -.002397    .0040865
       black |  -.9340767   .0938794    -9.95   0.000    -1.118151    -.750002
        smsa |   .5005579   .0830629     6.03   0.000     .3376918     .663424
       south |  -.0347358   .1352264    -0.26   0.797    -.2998818    .2304102
      reg661 |  -.1485539   .2044304    -0.73   0.467     -.549392    .2522842
      reg662 |  -.2470892   .1480177    -1.67   0.095    -.5373158    .0431374
      reg663 |  -.2067733   .1459919    -1.42   0.157    -.4930278    .0794812
      reg664 |  -.0629668   .1886945    -0.33   0.739    -.4329508    .3070172
      reg665 |  -.4899278   .1892012    -2.59   0.010    -.8609053   -.1189503
      reg666 |  -.6159944   .2053623    -3.00   0.003     -1.01866    -.213329
      reg667 |  -.4519167   .2070254    -2.18   0.029     -.857843   -.0459904
      reg668 |   .3502897    .245725     1.43   0.154    -.1315172    .8320966
      nearc2 |    .134544   .0766545     1.76   0.079    -.0157569    .2848448
       _cons |   16.94207   .2119949    79.92   0.000      16.5264    17.35774
------------------------------------------------------------------------------


Instrumental variables (2SLS) regression              Number of obs =    3010
                                                      Wald chi2(14) =  367.90
```

```
                                                      Prob > chi2   =  0.0000
                                                      R-squared     =       .
                                                      Root MSE      =  .55912

------------------------------------------------------------------------------
       lwage |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        educ |   .2902169   .1638565     1.77   0.077    -.0309359    .6113697
       exper |   .1737524   .0682907     2.54   0.011     .0399051    .3075996
     expersq |  -.0024694   .0004965    -4.97   0.000    -.0034426   -.0014962
       black |  -.0007278   .1538813    -0.00   0.996    -.3023297    .3008741
        smsa |   .0412356   .0882622     0.47   0.640    -.1317551    .2142264
       south |  -.1358451   .0394813    -3.44   0.001     -.213227   -.0584632
      reg661 |  -.0776366   .0664918    -1.17   0.243     -.207958    .0526849
      reg662 |    .035354   .0612182     0.58   0.564    -.0846314    .1553395
      reg663 |   .0810057   .0592115     1.37   0.171    -.0350467    .1970581
      reg664 |  -.0416309   .0572549    -0.73   0.467    -.1538484    .0705866
      reg665 |   .1203007   .1044847     1.15   0.250    -.0844855    .3250869
      reg666 |   .1489096   .1201537     1.24   0.215    -.0865873    .3844064
      reg667 |   .1038425   .1024349     1.01   0.311    -.0969262    .3046112
      reg668 |  -.2351579   .0828484    -2.84   0.005    -.3975377   -.0727781
       _cons |   1.076016   2.791449     0.39   0.700    -4.395123    6.547155
------------------------------------------------------------------------------
Instrumented:  educ
Instruments:   exper expersq black smsa south reg661 reg662 reg663 reg664
               reg665 reg666 reg667 reg668 nearc2

. estat firststage


Instrumental variables (2SLS) regression

      Source |       SS       df       MS              Number of obs =    3010
-------------+------------------------------           F( 14,  2995) =  193.58
       Model |  10242.5899    14  731.613568           Prob > F      =  0.0000
    Residual |  11319.4901  2995  3.77946248           R-squared     =  0.4750
-------------+------------------------------           Adj R-squared =  0.4726
       Total |  21562.0801  3009  7.16586243           Root MSE      =  1.9441

------------------------------------------------------------------------------
        educ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       exper |  -.4122819   .0337615   -12.21   0.000      -.47848   -.3460838
     expersq |   .0008447   .0016533     0.51   0.609     -.002397    .0040865
       black |  -.9340767   .0938794    -9.95   0.000    -1.118151    -.750002
        smsa |   .5005579   .0830629     6.03   0.000     .3376918     .663424
       south |  -.0347358   .1352264    -0.26   0.797    -.2998818    .2304102
      reg661 |  -.1485539   .2044304    -0.73   0.467     -.549392    .2522842
      reg662 |  -.2470892   .1480177    -1.67   0.095    -.5373158    .0431374
      reg663 |  -.2067733   .1459919    -1.42   0.157    -.4930278    .0794812
      reg664 |  -.0629668   .1886945    -0.33   0.739    -.4329508    .3070172
      reg665 |  -.4899278   .1892012    -2.59   0.010    -.8609053   -.1189503
      reg666 |  -.6159944   .2053623    -3.00   0.003     -1.01866    -.213329
      reg667 |  -.4519167   .2070254    -2.18   0.029     -.857843   -.0459904
      reg668 |   .3502897    .245725     1.43   0.154    -.1315172    .8320966
      nearc2 |    .134544   .0766545     1.76   0.079    -.0157569    .2848448
       _cons |   16.94207   .2119949    79.92   0.000      16.5264    17.35774
------------------------------------------------------------------------------
(no endogenous regressors)

 ( 1)  nearc2 = 0

       F(  1,  2995) =    3.08
            Prob > F =    0.0793

  First-stage regression summary statistics
  --------------------------------------------------------------------------
               |           Adjusted      Partial
      Variable |   R-sq.       R-sq.        R-sq.     F(1,2995)   Prob > F
  -------------+------------------------------------------------------------
```

```
         educ |  0.4750      0.4726       0.0010       3.08072    0.0793
  ------------------------------------------------------------------------------


  Minimum eigenvalue statistic = 3.08072

  Critical Values                       # of endogenous regressors:    1
  Ho: Instruments are weak              # of excluded instruments:     1
  ------------------------------------------------------------------------------
                                      |    5%     10%     20%     30%
  2SLS relative bias                  |         (not available)
  ------------------------------------+-----------------------------------------
                                      |   10%     15%     20%     25%
  2SLS Size of nominal 5% Wald test   |  16.38    8.96    6.66    5.53
  LIML Size of nominal 5% Wald test   |  16.38    8.96    6.66    5.53
  ------------------------------------------------------------------------------


.
. ivregress 2sls lwage exper expersq black smsa south reg661-reg668 (educ=nearc4
nearc2),
> first

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

                                                Number of obs   =       3010
                                                F(  15,   2994) =     182.45
                                                Prob > F        =     0.0000
                                                R-squared       =     0.4776
                                                Adj R-squared   =     0.4749
                                                Root MSE        =     1.9397

------------------------------------------------------------------------------
        educ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       exper |  -.4122915   .0336857   -12.24   0.000     -.478341    -.346242
     expersq |   .0008479   .0016496     0.51   0.607    -.0023865    .0040824
       black |  -.9451771   .0937141   -10.09   0.000    -1.128928   -.7614267
        smsa |   .4014136   .0868722     4.62   0.000     .2310784    .5717489
       south |  -.0419024   .1349359    -0.31   0.756     -.306479    .2226741
      reg661 |  -.1687842   .2040407    -0.83   0.408    -.5688583    .2312899
      reg662 |  -.2690322   .1477978    -1.82   0.069    -.5588278    .0207634
      reg663 |  -.1902101   .1457291    -1.31   0.192    -.4759494    .0955292
      reg664 |  -.0377274   .1883876    -0.20   0.841    -.4071097    .3316549
      reg665 |   -.437153   .1892848    -2.31   0.021    -.8082945   -.0660115
      reg666 |  -.5022505   .2070683    -2.43   0.015    -.9082611     -.09624
      reg667 |  -.3775412   .2074825    -1.82   0.069    -.7843639    .0292816
      reg668 |   .3820083   .2453149     1.56   0.120    -.0989946    .8630112
      nearc4 |   .3206001   .0842169     3.81   0.000     .1554713    .4857289
      nearc2 |   .1230071   .0765425     1.61   0.108    -.0270741    .2730882
       _cons |   16.77307   .2161279    77.61   0.000     16.34929    17.19684
------------------------------------------------------------------------------


Instrumental variables (2SLS) regression              Number of obs =    3010
                                                      Wald chi2(14) =  678.21
                                                      Prob > chi2   =  0.0000
                                                      R-squared     =  0.1320
                                                      Root MSE      =   .4134

------------------------------------------------------------------------------
       lwage |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        educ |    .168382   .0508209     3.31   0.001     .0687747    .2679892
       exper |   .1234909   .0221606     5.57   0.000     .0800569     .166925
     expersq |   -.002363   .0003543    -6.67   0.000    -.0030575   -.0016685
       black |  -.1133767   .0510411    -2.22   0.026    -.2134154   -.0133381
        smsa |   .1044526    .031661     3.30   0.001     .0423983     .166507
       south |  -.1409819   .0288211    -4.89   0.000    -.1974701   -.0844936
```

```
      reg661 |  -.1014153   .0442295    -2.29   0.022    -.1881034   -.0147271
      reg662 |   .0025296   .0342178     0.07   0.941     -.064536    .0695952
      reg663 |   .0492832   .0331164     1.49   0.137    -.0156238    .1141902
      reg664 |  -.0574669   .0398466    -1.44   0.149    -.1355648    .0206311
      reg665 |   .0536101    .048416     1.11   0.268    -.0412835    .1485037
      reg666 |   .0710579   .0543492     1.31   0.191    -.0354647    .1775804
      reg667 |   .0414306   .0506196     0.82   0.413     -.057782    .1406432
      reg668 |    -.20171   .0532987    -3.78   0.000    -.3061736   -.0972464
       _cons |   3.151123   .8666924     3.64   0.000     1.452437    4.849809
------------------------------------------------------------------------------
Instrumented:  educ
Instruments:   exper expersq black smsa south reg661 reg662 reg663 reg664
               reg665 reg666 reg667 reg668 nearc4 nearc2

. estat firststage


Instrumental variables (2SLS) regression

      Source |       SS       df       MS              Number of obs =    3010
-------------+------------------------------           F( 15,  2994) =  182.45
       Model |  10297.1164    15  686.474426           Prob > F      =  0.0000
    Residual |  11264.9637  2994  3.76251292           R-squared     =  0.4776
-------------+------------------------------           Adj R-squared =  0.4749
       Total |  21562.0801  3009  7.16586243           Root MSE      =  1.9397

------------------------------------------------------------------------------
        educ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       exper |  -.4122915   .0336857   -12.24   0.000     -.478341    -.346242
     expersq |   .0008479   .0016496     0.51   0.607    -.0023865    .0040824
       black |  -.9451771   .0937141   -10.09   0.000    -1.128928   -.7614267
        smsa |   .4014136   .0868722     4.62   0.000     .2310784    .5717489
       south |  -.0419024   .1349359    -0.31   0.756     -.306479    .2226741
      reg661 |  -.1687842   .2040407    -0.83   0.408    -.5688583    .2312899
      reg662 |  -.2690322   .1477978    -1.82   0.069    -.5588278    .0207634
      reg663 |  -.1902101   .1457291    -1.31   0.192    -.4759494    .0955292
      reg664 |  -.0377274   .1883876    -0.20   0.841    -.4071097    .3316549
      reg665 |   -.437153   .1892848    -2.31   0.021    -.8082945   -.0660115
      reg666 |  -.5022505   .2070683    -2.43   0.015    -.9082611     -.09624
      reg667 |  -.3775412   .2074825    -1.82   0.069    -.7843639    .0292816
      reg668 |   .3820083   .2453149     1.56   0.120    -.0989946    .8630112
      nearc4 |   .3206001   .0842169     3.81   0.000     .1554713    .4857289
      nearc2 |   .1230071   .0765425     1.61   0.108    -.0270741    .2730882
       _cons |   16.77307   .2161279    77.61   0.000     16.34929    17.19684
------------------------------------------------------------------------------
(no endogenous regressors)

 ( 1)  nearc4 = 0
 ( 2)  nearc2 = 0

       F(  2,  2994) =    8.79
            Prob > F =    0.0002

  First-stage regression summary statistics
  --------------------------------------------------------------------------
               |            Adjusted      Partial
      Variable |   R-sq.       R-sq.        R-sq.     F(2,2994)   Prob > F
  -------------+------------------------------------------------------------
          educ |  0.4776      0.4749       0.0058       8.79331    0.0002
  --------------------------------------------------------------------------


  Minimum eigenvalue statistic = 8.79331

  Critical Values                       # of endogenous regressors:    1
  Ho: Instruments are weak              # of excluded instruments:     2
  ---------------------------------------------------------------------
                                      |    5%     10%     20%     30%
  2SLS relative bias                  |         (not available)
```

```
  ----------------------------------+----------------------------------
                                    |   10%     15%     20%     25%
  2SLS Size of nominal 5% Wald test |  19.93   11.59    8.75    7.25
  LIML Size of nominal 5% Wald test |   8.68    5.33    4.42    3.92
  ------------------------------------------------------------------------


. estat overid

  Tests of overidentifying restrictions:

  Sargan (score) chi2(1) =  1.22725  (p = 0.2679)
  Basmann chi2(1)        =  1.22123  (p = 0.2691)

.
.
. /* 5.   Test di sovraidentificazione in presenza di più strumenti (con storie diverse)
> */
.
. * con 2 misure di distanza:
.
. ivregress 2sls lwage exper expersq black smsa south reg661-reg668 (educ=nearc4 nearc2
m
> otheduc)

Instrumental variables (2SLS) regression              Number of obs =    2657
                                                      Wald chi2(14) =  731.59
                                                      Prob > chi2   =  0.0000
                                                      R-squared     =  0.2793
                                                      Root MSE      =  .37691

------------------------------------------------------------------------------
       lwage |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        educ |   .1053494   .0133209     7.91   0.000     .0792409    .1314579
       exper |   .0971806   .0088803    10.94   0.000     .0797755    .1145858
     expersq |  -.0022461   .0003498    -6.42   0.000    -.0029317   -.0015604
       black |  -.1729388   .0234333    -7.38   0.000    -.2188671   -.1270104
        smsa |   .1359925   .0183419     7.41   0.000      .100043    .1719419
       south |  -.1260178    .028535    -4.42   0.000    -.1819453   -.0700903
       reg661 |  -.0923294   .0425224    -2.17   0.030    -.1756719    -.008987
       reg662 |   .0006075    .030124     0.02   0.984    -.0584345    .0596495
       reg663 |   .0446669   .0293764     1.52   0.128    -.0129097    .1022435
       reg664 |  -.0574305   .0378392    -1.52   0.129     -.131594    .0167329
       reg665 |   .0066763   .0390654     0.17   0.864    -.0698906    .0832432
       reg666 |   .0158252   .0438071     0.36   0.718    -.0700351    .1016855
       reg667 |    .003463   .0425394     0.08   0.935    -.0799126    .0868386
       reg668 |  -.1680448    .049129    -3.42   0.001    -.2643359   -.0717537
        _cons |   4.209771   .2316056    18.18   0.000     3.755832     4.66371
------------------------------------------------------------------------------
Instrumented:  educ
Instruments:   exper expersq black smsa south reg661 reg662 reg663 reg664
               reg665 reg666 reg667 reg668 nearc4 nearc2 motheduc

. estat firststage


Instrumental variables (2SLS) regression

      Source |       SS       df       MS              Number of obs =    2657
-------------+------------------------------           F( 16,  2640) =  162.91
       Model |  9249.11223    16  578.069514           Prob > F      =  0.0000
    Residual |  9367.62243  2640  3.54834183           R-squared     =  0.4968
-------------+------------------------------           Adj R-squared =  0.4938
       Total |  18616.7347  2656  7.00931275           Root MSE      =  1.8837

------------------------------------------------------------------------------
        educ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       exper |  -.3801641   .0350173   -10.86   0.000    -.4488282      -.3115
```

```
     expersq |    .001184   .0017481     0.68   0.498    -.0022439    .0046118
       black |  -.5798078   .1035967    -5.60   0.000    -.7829468   -.3766689
        smsa |   .2783067   .0905591     3.07   0.002     .1007327    .4558808
       south |  -.0833514   .1425477    -0.58   0.559    -.3628678    .1961651
      reg661 |  -.2329213   .2143628    -1.09   0.277    -.6532574    .1874148
      reg662 |  -.3129518   .1498239    -2.09   0.037     -.606736   -.0191675
      reg663 |  -.2872556   .1487132    -1.93   0.054    -.5788617    .0043505
      reg664 |  -.0709016    .193396    -0.37   0.714    -.4501247    .3083216
      reg665 |  -.2849402   .1962296    -1.45   0.147    -.6697196    .0998393
      reg666 |  -.4114599   .2184479    -1.88   0.060    -.8398064    .0168866
      reg667 |  -.2249332   .2136483    -1.05   0.293    -.6438683    .1940019
      reg668 |   .2294939   .2489762     0.92   0.357    -.2587143    .7177022
      nearc4 |   .3099393   .0880413     3.52   0.000     .1373024    .4825762
      nearc2 |    .075961   .0795363     0.96   0.340    -.0799988    .2319207
    motheduc |    .186555   .0128949    14.47   0.000     .1612699    .2118402
       _cons |   14.60342   .2698468    54.12   0.000     14.07429    15.13256
------------------------------------------------------------------------------
(no endogenous regressors)

 ( 1)  nearc4 = 0
 ( 2)  nearc2 = 0
 ( 3)  motheduc = 0

       F(  3,  2640) =   75.21
            Prob > F =    0.0000

  First-stage regression summary statistics
  --------------------------------------------------------------------------
               |           Adjusted      Partial
      Variable |   R-sq.       R-sq.        R-sq.     F(3,2640)   Prob > F
  -------------+------------------------------------------------------------
          educ |  0.4968      0.4938       0.0787       75.2056    0.0000
  --------------------------------------------------------------------------


  Minimum eigenvalue statistic = 75.2056

  Critical Values                       # of endogenous regressors:    1
  Ho: Instruments are weak              # of excluded instruments:     3
  ---------------------------------------------------------------------
                                      |    5%     10%     20%     30%
  2SLS relative bias                  |  13.91    9.08    6.46    5.39
  ------------------------------------+--------------------------------
                                      |   10%     15%     20%     25%
  2SLS Size of nominal 5% Wald test   |  22.30   12.83    9.54    7.80
  LIML Size of nominal 5% Wald test   |   6.46    4.36    3.69    3.32
  ---------------------------------------------------------------------


. estat overid

  Tests of overidentifying restrictions:

  Sargan (score) chi2(2) =  3.54156  (p = 0.1702)
  Basmann chi2(2)        =   3.5236  (p = 0.1717)

.
. ivregress 2sls lwage exper expersq black smsa south reg661-reg668 motheduc
(educ=nearc4
>  nearc2),first

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

                                                  Number of obs   =       2657
                                                  F(  16,   2640) =     162.91
                                                  Prob > F        =     0.0000
                                                  R-squared       =     0.4968
                                                  Adj R-squared   =     0.4938
                                                  Root MSE        =     1.8837
```

```
------------------------------------------------------------------------------
        educ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       exper |  -.3801641   .0350173   -10.86   0.000    -.4488282      -.3115
     expersq |    .001184   .0017481     0.68   0.498    -.0022439     .0046118
       black |  -.5798078   .1035967    -5.60   0.000    -.7829468    -.3766689
        smsa |   .2783067   .0905591     3.07   0.002     .1007327     .4558808
       south |  -.0833514   .1425477    -0.58   0.559    -.3628678     .1961651
      reg661 |  -.2329213   .2143628    -1.09   0.277    -.6532574     .1874148
      reg662 |  -.3129518   .1498239    -2.09   0.037     -.606736    -.0191675
      reg663 |  -.2872556   .1487132    -1.93   0.054    -.5788617     .0043505
      reg664 |  -.0709016    .193396    -0.37   0.714    -.4501247     .3083216
      reg665 |  -.2849402   .1962296    -1.45   0.147    -.6697196     .0998393
      reg666 |  -.4114599   .2184479    -1.88   0.060    -.8398064     .0168866
      reg667 |  -.2249332   .2136483    -1.05   0.293    -.6438683     .1940019
      reg668 |   .2294939   .2489762     0.92   0.357    -.2587143     .7177022
    motheduc |    .186555   .0128949    14.47   0.000     .1612699     .2118402
      nearc4 |   .3099393   .0880413     3.52   0.000     .1373024     .4825762
      nearc2 |    .075961   .0795363     0.96   0.340    -.0799988     .2319207
       _cons |   14.60342   .2698468    54.12   0.000     14.07429     15.13256
------------------------------------------------------------------------------


Instrumental variables (2SLS) regression              Number of obs =    2657
                                                      Wald chi2(15) =  700.07
                                                      Prob > chi2   =  0.0000
                                                      R-squared     =  0.2467
                                                      Root MSE      =  .38534

------------------------------------------------------------------------------
       lwage |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        educ |   .1270653   .0552046     2.30   0.021     .0188662    .2352644
       exper |   .1053731   .0221307     4.76   0.000     .0619978    .1487484
     expersq |  -.0022713    .000363    -6.26   0.000    -.0029828   -.0015598
       black |  -.1613919   .0371909    -4.34   0.000    -.2342848   -.0884991
        smsa |   .1278264   .0275022     4.65   0.000      .073923    .1817298
       south |  -.1241392   .0295385    -4.20   0.000    -.1820336   -.0662447
      reg661 |  -.0869427   .0454546    -1.91   0.056    -.1760322    .0021468
      reg662 |   .0072179   .0348388     0.21   0.836    -.0610649    .0755007
      reg663 |   .0520656   .0351321     1.48   0.138    -.0167921    .1209233
      reg664 |   -.054263   .0394654    -1.37   0.169    -.1316138    .0230878
      reg665 |   .0144992   .0443465     0.33   0.744    -.0724183    .1014167
      reg666 |   .0275743   .0533265     0.52   0.605    -.0769438    .1320924
      reg667 |   .0103582   .0466912     0.22   0.824    -.0811548    .1018712
      reg668 |  -.1711957   .0508251    -3.37   0.001     -.270811   -.0715804
    motheduc |  -.0043348   .0106789    -0.41   0.685     -.025265    .0165955
       _cons |   3.891265   .8196055     4.75   0.000     2.284868    5.497663
------------------------------------------------------------------------------
Instrumented:  educ
Instruments:   exper expersq black smsa south reg661 reg662 reg663 reg664
               reg665 reg666 reg667 reg668 motheduc nearc4 nearc2


.
. * con 1 misura di distanza:
.
. ivregress 2sls lwage exper expersq black smsa south reg661-reg668 (educ=nearc4
motheduc
> )

Instrumental variables (2SLS) regression              Number of obs =    2657
                                                      Wald chi2(14) =  731.23
                                                      Prob > chi2   =  0.0000
                                                      R-squared     =  0.2811
                                                      Root MSE      =  .37645

------------------------------------------------------------------------------
       lwage |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
```

```
       educ |   .1037529   .0133319     7.78   0.000      .077623    .1298829
      exper |   .0965246   .0088765    10.87   0.000     .0791271    .1139222
    expersq |   -.002245   .0003494    -6.43   0.000    -.0029298   -.0015602
      black |   -.174384   .0234176    -7.45   0.000    -.2202817   -.1284862
       smsa |   .1367723   .0183245     7.46   0.000     .1008569    .1726877
      south |  -.1262125   .0285008    -4.43   0.000    -.1820731    -.070352
     reg661 |  -.0925432   .0424715    -2.18   0.029    -.1757858   -.0093007
     reg662 |   .0001072    .030089     0.00   0.997    -.0588661    .0590805
     reg663 |   .0441621   .0293423     1.51   0.132    -.0133477    .1016719
     reg664 |  -.0576356   .0377938    -1.53   0.127    -.1317102     .016439
     reg665 |   .0060154     .03902     0.15   0.877    -.0704625    .0824932
     reg666 |   .0148983   .0437572     0.34   0.733    -.0708642    .1006608
     reg667 |   .0026906   .0424902     0.06   0.950    -.0805886    .0859699
     reg668 |  -.1676439   .0490704    -3.42   0.001    -.2638201   -.0714677
      _cons |   4.237065   .2317806    18.28   0.000     3.782783    4.691346
------------------------------------------------------------------------------
Instrumented:  educ
Instruments:   exper expersq black smsa south reg661 reg662 reg663 reg664
               reg665 reg666 reg667 reg668 nearc4 motheduc

. estat firststage


Instrumental variables (2SLS) regression

      Source |       SS       df       MS              Number of obs =    2657
-------------+------------------------------           F( 15,  2641) =  173.72
       Model |  9245.87573    15  616.391715           Prob > F      =  0.0000
    Residual |  9370.85894  2641  3.54822376           R-squared     =  0.4966
-------------+------------------------------           Adj R-squared =  0.4938
       Total |  18616.7347  2656  7.00931275           Root MSE      =  1.8837

------------------------------------------------------------------------------
        educ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       exper |  -.3798578   .0350152   -10.85   0.000    -.4485179   -.3111978
     expersq |   .0011853   .0017481     0.68   0.498    -.0022425    .0046131
       black |  -.5738859   .1034093    -5.55   0.000    -.7766572   -.3711145
        smsa |   .2875537   .0900386     3.19   0.001     .1110005    .4641069
       south |  -.0895529   .1423973    -0.63   0.529    -.3687745    .1896687
      reg661 |  -.2596836   .2125199    -1.22   0.222    -.6764058    .1570387
      reg662 |   -.325821   .1492143    -2.18   0.029    -.6184097   -.0332323
      reg663 |  -.3168762   .1454407    -2.18   0.029    -.6020653    -.031687
      reg664 |  -.1092387   .1891811    -0.58   0.564    -.4801969    .2617195
      reg665 |  -.3143063   .1938024    -1.62   0.105    -.6943262    .0657135
      reg666 |  -.4184049   .2183232    -1.92   0.055    -.8465068     .009697
      reg667 |  -.2543464   .2114134    -1.20   0.229     -.668899    .1602063
      reg668 |   .1886904    .245279     0.77   0.442    -.2922681    .6696488
      nearc4 |   .3147152   .0878977     3.58   0.000     .1423599    .4870705
    motheduc |    .187172   .0128785    14.53   0.000     .1619189     .212425
       _cons |   14.64173   .2668451    54.87   0.000     14.11848    15.16497
------------------------------------------------------------------------------
(no endogenous regressors)

 ( 1)  nearc4 = 0
 ( 2)  motheduc = 0

       F(  2,  2641) =  112.36
            Prob > F =    0.0000

  First-stage regression summary statistics
  --------------------------------------------------------------------------
               |           Adjusted      Partial
      Variable |   R-sq.       R-sq.        R-sq.     F(2,2641)   Prob > F
  -------------+------------------------------------------------------------
          educ |  0.4966      0.4938       0.0784       112.356    0.0000
  --------------------------------------------------------------------------


  Minimum eigenvalue statistic = 112.356
```

```
  Critical Values                       # of endogenous regressors:    1
  Ho: Instruments are weak              # of excluded instruments:     2
  ---------------------------------------------------------------------
                                      |    5%     10%     20%     30%
  2SLS relative bias                  |         (not available)
  ------------------------------------+--------------------------------
                                      |   10%     15%     20%     25%
  2SLS Size of nominal 5% Wald test   |  19.93   11.59    8.75    7.25
  LIML Size of nominal 5% Wald test   |   8.68    5.33    4.42    3.92
  ---------------------------------------------------------------------


. estat overid

  Tests of overidentifying restrictions:

  Sargan (score) chi2(1) =  .003325  (p = 0.9540)
  Basmann chi2(1)        =  .003305  (p = 0.9542)

.
. ivregress 2sls lwage exper expersq black smsa south reg661-reg668 motheduc
(educ=nearc4
> ),first

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

                                                Number of obs   =       2657
                                                F(  15,   2641) =     173.72
                                                Prob > F        =     0.0000
                                                R-squared       =     0.4966
                                                Adj R-squared   =     0.4938
                                                Root MSE        =     1.8837

------------------------------------------------------------------------------
        educ |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       exper |  -.3798578   .0350152   -10.85   0.000    -.4485179   -.3111978
     expersq |   .0011853   .0017481     0.68   0.498    -.0022425    .0046131
       black |  -.5738859   .1034093    -5.55   0.000    -.7766572   -.3711145
        smsa |   .2875537   .0900386     3.19   0.001     .1110005    .4641069
       south |  -.0895529   .1423973    -0.63   0.529    -.3687745    .1896687
      reg661 |  -.2596836   .2125199    -1.22   0.222    -.6764058    .1570387
      reg662 |   -.325821   .1492143    -2.18   0.029    -.6184097   -.0332323
      reg663 |  -.3168762   .1454407    -2.18   0.029    -.6020653    -.031687
      reg664 |  -.1092387   .1891811    -0.58   0.564    -.4801969    .2617195
      reg665 |  -.3143063   .1938024    -1.62   0.105    -.6943262    .0657135
      reg666 |  -.4184049   .2183232    -1.92   0.055    -.8465068     .009697
      reg667 |  -.2543464   .2114134    -1.20   0.229     -.668899    .1602063
      reg668 |   .1886904    .245279     0.77   0.442    -.2922681    .6696488
    motheduc |    .187172   .0128785    14.53   0.000     .1619189     .212425
      nearc4 |   .3147152   .0878977     3.58   0.000     .1423599    .4870705
       _cons |   14.64173   .2668451    54.87   0.000     14.11848    15.16497
------------------------------------------------------------------------------


Instrumental variables (2SLS) regression              Number of obs =    2657
                                                      Wald chi2(15) =  734.42
                                                      Prob > chi2   =  0.0000
                                                      R-squared     =  0.2842
                                                      Root MSE      =  .37563

------------------------------------------------------------------------------
       lwage |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        educ |   .1006275   .0556954     1.81   0.071    -.0085334    .2097884
       exper |   .0953451   .0222496     4.29   0.000     .0517368    .1389535
     expersq |  -.0022414   .0003542    -6.33   0.000    -.0029357   -.0015471
       black |  -.1760506   .0371172    -4.74   0.000     -.248799   -.1033021
```

```
        smsa |    .137949   .0273669     5.04   0.000     .0843108    .1915872
       south |  -.1264834   .0288225    -4.39   0.000    -.1829743   -.0699924
      reg661 |  -.0933171   .0444444    -2.10   0.036    -.1804265   -.0062076
      reg662 |  -.0008443    .034242    -0.02   0.980    -.0679574    .0662688
      reg663 |   .0430976   .0345914     1.25   0.213    -.0247003    .1108954
      reg664 |  -.0580913   .0385272    -1.51   0.132    -.1336032    .0174207
      reg665 |   .0048888    .043543     0.11   0.911    -.0804539    .0902315
      reg666 |   .0132068   .0525651     0.25   0.802    -.0898188    .1162325
      reg667 |   .0016962   .0457571     0.04   0.970    -.0879862    .0913785
      reg668 |  -.1671891   .0495923    -3.37   0.001    -.2643882   -.0699899
    motheduc |   .0006213    .010752     0.06   0.954    -.0204522    .0216949
       _cons |   4.282936   .8267733     5.18   0.000      2.66249    5.903382
------------------------------------------------------------------------------
Instrumented:  educ
Instruments:   exper expersq black smsa south reg661 reg662 reg663 reg664
               reg665 reg666 reg667 reg668 motheduc nearc4

.
.
. /* 6.   Operazioni di chiusura */
.
. save card_new.dta,replace
file card_new.dta saved

.
. log close
       log:
C:\Documenti\TOMMASO\lezioni\bocconi\econometria\esercitazione_emp_4\Lezione
> _info_4.log
  log type:  text
 closed on:  15 Dec 2008, 10:26:14
-------------------------------------------------------------------------------
-
```