EXEMPLO DE PROBIT COM VARIÁVEL EXPLICATIVA ENDÓGENA BINÁRIA
PROBIT BIVARIADO

Dados: labsup

MODELO LINEAR DE PROBABILIDADE

```
. regress worked morekids nonmomi educ age agesq black hispan, vce(rob)

Linear regression                                      Number of obs =   31857
                                                       F(  7, 31849) =  452.07
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.0817
                                                       Root MSE      =   .4714

------------------------------------------------------------------------------
             |               Robust
      worked |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    morekids |  -.1091198   .0055043   -19.82   0.000    -.1199084   -.0983312
     nonmomi |  -.0011675    .000139    -8.40   0.000      -.00144    -.000895
        educ |   .0206475   .0009112    22.66   0.000     .0188614    .0224336
         age |   .0562704   .0113556     4.96   0.000      .034013    .0785278
       agesq |  -.0007829   .0001948    -4.02   0.000    -.0011646   -.0004011
       black |   .0176482   .0347904     0.51   0.612    -.0505423    .0858387
      hispan |  -.1285859   .0347921    -3.70   0.000    -.1967798   -.0603919
       _cons |   -.448645   .1670992    -2.68   0.007    -.7761658   -.1211242
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PROBIT

```
. probit worked morekids nonmomi educ age agesq black hispan

Iteration 0:   log likelihood = -21565.093
Iteration 1:   log likelihood = -20222.271
Iteration 2:   log likelihood = -20218.111
Iteration 3:   log likelihood = -20218.111

Probit regression                                      Number of obs   =      31857
                                                       LR chi2(7)      =    2693.96
                                                       Prob > chi2     =     0.0000
Log likelihood = -20218.111                            Pseudo R2       =     0.0625
------------------------------------------------------------------------------
      worked |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    morekids |  -.2986554   .0150511   -19.84   0.000    -.3281551   -.2691558
     nonmomi |  -.0031412   .0003701    -8.49   0.000    -.0038665   -.0024159
        educ |   .0554282   .0024978    22.19   0.000     .0505327    .0603237
         age |   .1479387   .0308452     4.80   0.000     .0874834    .2083941
       agesq |  -.0020364   .0005305    -3.84   0.000    -.0030763   -.0009966
       black |   .0412891   .0916525     0.45   0.652    -.1383465    .2209248
      hispan |  -.3586388     .09188    -3.90   0.000    -.5387203   -.1785574
       _cons |  -2.496476   .4516554    -5.53   0.000    -3.381704   -1.611247
------------------------------------------------------------------------------

. margins, dydx (morekids)
Average marginal effects                               Number of obs   =      31857
Model VCE    : OIM
Expression   : Pr(worked), predict()
dy/dx w.r.t. : morekids
------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    morekids |  -.1082686   .0053561   -20.21   0.000    -.1187664   -.0977708
------------------------------------------------------------------------------
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. ivregress 2sls worked nonmomi educ age agesq black hispan (morekids = samesex),
vce(rob)

Instrumental variables (2SLS) regression              Number of obs =   31857
                                                      Wald chi2(7)  = 2622.78
                                                      Prob > chi2   =  0.0000
                                                      R-squared     =  0.0737
                                                      Root MSE      =  .47341

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             |               Robust
      worked |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    morekids |   -.200832   .0964607    -2.08   0.037    -.3898915   -.0117726
     nonmomi |    -.00126   .0001698    -7.42   0.000    -.0015928   -.0009271
        educ |   .0175522   .0033773     5.20   0.000     .0109329    .0241715
         age |   .0603517   .0121644     4.96   0.000     .0365098    .0841935
       agesq |  -.0008178   .0001988    -4.11   0.000    -.0012075   -.0004281
       black |   .0168118   .0351678     0.48   0.633    -.0521159    .0857396
      hispan |  -.1308112   .0352412    -3.71   0.000    -.1998827   -.0617397
       _cons |   -.454969   .1678221    -2.71   0.007    -.7838942   -.1260437
------------------------------------------------------------------------------
Instrumented:  morekids
Instruments:   nonmomi educ age agesq black hispan samesex
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BIVARIATE PROBIT

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. biprobit (worked= morekids nonmomi educ age agesq black hispan) (morekids=
nonmomi educ age agesq black hispan samesex)

Fitting comparison equation 1:

Iteration 0:   log likelihood = -21565.093
Iteration 1:   log likelihood = -20222.271
Iteration 2:   log likelihood = -20218.111
Iteration 3:   log likelihood = -20218.111

Fitting comparison equation 2:

Iteration 0:   log likelihood = -22076.436
Iteration 1:   log likelihood = -20893.502
Iteration 2:   log likelihood = -20889.981
Iteration 3:   log likelihood = -20889.981

Comparison:    log likelihood = -41108.092

Fitting full model:

Iteration 0:   log likelihood = -41108.092
Iteration 1:   log likelihood = -41106.857
Iteration 2:   log likelihood = -41106.459
Iteration 3:   log likelihood = -41106.423
Iteration 4:   log likelihood = -41106.422

Seemingly unrelated bivariate probit              Number of obs   =      31857
                                                  Wald chi2(14)   =    5124.29
Log likelihood = -41106.422                       Prob > chi2     =     0.0000
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------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
worked       |
    morekids |  -.7025719    .204014    -3.44   0.001    -1.102432   -.3027119
     nonmomi |  -.0034903    .000395    -8.84   0.000    -.0042645   -.0027161
        educ |   .0405621   .0085385     4.75   0.000     .0238271    .0572972
         age |   .1632256   .0312412     5.22   0.000     .1019939    .2244573
       agesq |  -.0021524   .0005277    -4.08   0.000    -.0031867    -.001118
       black |   .0367322   .0909997     0.40   0.686    -.1416239    .2150883
      hispan |  -.3614826   .0912096    -3.96   0.000    -.5402502    -.182715
       _cons |  -2.475317   .4496294    -5.51   0.000    -3.356575    -1.59406
-------------+----------------------------------------------------------------
morekids     |
     nonmomi |  -.0027063   .0003685    -7.34   0.000    -.0034285   -.0019841
        educ |  -.0907148   .0024968   -36.33   0.000    -.0956083   -.0858212
         age |   .1190243   .0307613     3.87   0.000     .0587333    .1793154
       agesq |   -.001028   .0005284    -1.95   0.052    -.0020636    7.54e-06
       black |  -.0277804   .0921479    -0.30   0.763     -.208387    .1528263
      hispan |  -.0690523   .0922843    -0.75   0.454    -.2499262    .1118217
     samesex |   .1446566   .0144319    10.02   0.000     .1163705    .1729427
       _cons |  -1.572557   .4514335    -3.48   0.000    -2.457351   -.6877639
-------------+----------------------------------------------------------------
     /athrho |   .2599507   .1396201     1.86   0.063    -.0136996     .533601
-------------+----------------------------------------------------------------
         rho |   .2542495   .1305946                     -.0136987    .4881289
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Likelihood-ratio test of rho=0:     chi2(1) =  3.33969    Prob > chi2 = 0.0676
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APE para morekids

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. g fitind1= -.7025719 -.0034903*nonmomi+  .0405621*educ+ .1632256*age -0021524*agesq
+ .0367322*black-.3614826 *hispan -2.475317

. g fitind2= -.0034903*nonmomi+  .0405621*educ+ .1632256*age -.0021524*agesq+
.0367322*black-.3614826 *hispan -2.475


. g PE=normal(fitind1)-normal(fitind2)

. sum PE

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
          PE |     31857    -.255915    .0208075  -.2746262  -.1606573
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