. cnop y5 pb spread houst gdp in 5/214, zn(spread gdp) zp(pb spread) infcat(3) ~~correlated~~ **endoswitch**

~~Run CNOP estimation~~ **Run estimation of three-part zero-inflated ordered probit (ZIOP-3) model with endogenous switching**

~~Calculating initial values~~ **Computing starting values:**

~~1-stage OP: z-p-n~~ **Independent regime equation**

Iteration 0: f(p) = -196.03763

Iteration 1: f(p) = -193.31102

Iteration 2: f(p) = -193.303

Iteration 3: f(p) = -193.303

~~2 stage OP on positive and 0~~ **Independent outcome equation for y≥0**

Iteration 0: f(p) = -99.924674

Iteration 1: f(p) = -84.250264

Iteration 2: f(p) = -83.902822

Iteration 3: f(p) = -83.902446

Iteration 4: f(p) = -83.902446

~~2 stage OP on negative and 0~~ **Independent outcome equation for y≤0**

Iteration 0: f(p) = -119.03663

Iteration 1: f(p) = -104.78377

Iteration 2: f(p) = -104.58404

Iteration 3: f(p) = -104.58339

Iteration 4: f(p) = -104.58339

Estimating ~~CNOP~~ **ZIOP-3** ~~core stage~~ **with exogenous switching**

Attempt 0

Iteration 0: f(p) = -299.55217

Iteration 1: f(p) = -179.92216 (not concave)

Iteration 2: f(p) = -165.08949

numerical derivatives are approximate

flat or discontinuous region encountered

could not calculate numerical derivatives -- flat or discontinuous region encountered

could not calculate numerical derivatives -- flat or discontinuous region encountered

~~CNOP~~ **ZIOP-3** final optimization encountered error code 6: could not calculate numerical derivatives -- flat or discontinuo

> us region encountered

Attempt 1

Iteration 0: f(p) = -299.55217

Iteration 1: f(p) = -276.41173

Iteration 2: f(p) = -214.54685

numerical derivatives are approximate

flat or discontinuous region encountered

could not calculate numerical derivatives -- flat or discontinuous region encountered

could not calculate numerical derivatives -- flat or discontinuous region encountered

~~CNOP~~ **ZIOP-3** final optimization encountered error code 6: could not calculate numerical derivatives -- flat or discontinuo

> us region encountered

Attempt 2

Iteration 0: f(p) = -299.55217

Iteration 1: f(p) = -285.35061 (backed up)

Iteration 2: f(p) = -257.46272 (backed up)

Iteration 3: f(p) = -215.4729

Iteration 4: f(p) = -202.24901

Iteration 5: f(p) = -200.57998

Iteration 6: f(p) = -181.17551

Iteration 7: f(p) = -179.87917

Iteration 8: f(p) = -177.39114

Iteration 9: f(p) = -171.00597

Iteration 10: f(p) = -167.27049

Iteration 11: f(p) = -166.51204

Iteration 12: f(p) = -164.06284

Iteration 13: f(p) = -162.7581

Iteration 14: f(p) = -161.73276

Iteration 15: f(p) = -160.83857

Iteration 16: f(p) = -160.25561

Iteration 17: f(p) = -159.92917

Iteration 18: f(p) = -159.73263

Iteration 19: f(p) = -159.63738

Iteration 20: f(p) = -159.5414

Iteration 21: f(p) = -157.76385

Iteration 22: f(p) = -157.76385 (backed up)

Iteration 23: f(p) = -157.76385 (backed up)

Iteration 24: f(p) = -157.17805

Iteration 25: f(p) = -156.28634

Iteration 26: f(p) = -155.78479

Iteration 27: f(p) = -155.12864

Iteration 28: f(p) = -154.77648

Iteration 29: f(p) = -154.55359

Iteration 30: f(p) = -154.07533

Convergence not achieved

Attempt 3

Iteration 0: f(p) = -299.55217

Iteration 1: f(p) = -285.35061 (backed up)

Iteration 2: f(p) = -269.93457 (backed up)

Iteration 3: f(p) = -225.48024 (backed up)

Iteration 4: f(p) = -181.59568 (backed up)

Iteration 5: f(p) = -181.12516

Iteration 6: f(p) = -179.55

Iteration 7: f(p) = -173.24568

Iteration 8: f(p) = -172.4743

Iteration 9: f(p) = -167.95944

Iteration 10: f(p) = -167.00296

Iteration 11: f(p) = -165.93969

Iteration 12: f(p) = -163.49532

Iteration 13: f(p) = -162.97659

Iteration 14: f(p) = -161.68619

Iteration 15: f(p) = -161.39808

Iteration 16: f(p) = -160.44021

Iteration 17: f(p) = -160.19025

Iteration 18: f(p) = -159.91467

Iteration 19: f(p) = -159.75181

Iteration 20: f(p) = -159.67694

Iteration 21: f(p) = -159.62005

Iteration 22: f(p) = -158.01489

Iteration 23: f(p) = -157.84093

Iteration 24: f(p) = -154.90806

Iteration 25: f(p) = -153.56078

Iteration 26: f(p) = -151.96348

Iteration 27: f(p) = -149.39325

Iteration 28: f(p) = -148.65843

Iteration 29: f(p) = -146.17648

Iteration 30: f(p) = -145.58004

Convergence not achieved

Attempt 4

Iteration 0: f(p) = -298.13085 (not concave)

Iteration 1: f(p) = -170.53666 (not concave)

Iteration 2: f(p) = -159.26002

Iteration 3: f(p) = -142.73595

Iteration 4: f(p) = -140.03175

Iteration 5: f(p) = -139.57415

Iteration 6: f(p) = -139.55341

Iteration 7: f(p) = -139.55292

Iteration 8: f(p) = -139.55292

Calculation completed

~~CNOP estimation successful~~ **Estimation of** **ZIOP-3** **with exogenous switching successful**

~~Seeking rhos~~ **Computing starting values for correlation coefficients**

1 2 3

+-------------------------------------------------------------+

1 | ~~Best correlations~~ **Starting values for correlation coefficients** .19 .19 |

+-------------------------------------------------------------+

Estimating ~~CNOPC core~~ **ZIOP-3** **with endogenous switching**

Attempt 0

Iteration 0: f(p) = -139.20475

Iteration 1: f(p) = -138.45258

Iteration 2: f(p) = -138.34412

Iteration 3: f(p) = -138.34367

Iteration 4: f(p) = -138.34367

~~Calculation~~ **Estimation** completed

**Three-part zero-inflated ordered probit model** **with endogenous switching**

**Number of observations =**

**Log likelihood =**

------------------------------------------------------------------------------

y5 | Coef. Std. Err. z P>|z| [95% Conf. Interval]

-------------+----------------------------------------------------------------

~~select~~ **Regime equation** |

pb | 1.604927 .3413208 4.70 0.000 .9359507 2.273903

spread | 2.170005 .3587646 6.05 0.000 1.466839 2.87317

houst | 5.094639 1.017013 5.01 0.000 3.101331 7.087947

gdp | .3705683 .1120938 3.31 0.001 .1508686 .590268

**delete this line** -------------+----------------------------------------------------------------

**/cut1** |

~~\_cons~~ | 8.321189 1.826667 4.56 0.000 4.740987 11.90139

**delete this line** -------------+----------------------------------------------------------------

**/cut2** |

~~\_cons~~ | 11.96263 1.996944 5.99 0.000 8.048694 15.87657

-------------+----------------------------------------------------------------

~~y5\_positive~~ **Outcome equation (+)** |

pb | 2.727154 1.010678 2.70 0.007 .7462618 4.708046

spread | 1.927343 .7356434 2.62 0.009 .485508 3.369177

**delete this line** -------------+----------------------------------------------------------------

**/cut1**  |

~~\_cons~~ | -1.231859 1.116686 -1.10 0.270 -3.420523 .9568047

**delete this line** -------------+----------------------------------------------------------------

**/cut2** |

~~\_cons~~ | 3.790871 1.147481 3.30 0.001 1.541849 6.039892

-------------+----------------------------------------------------------------

~~y5\_negative~~ **Outcome equation (-)** |

spread | 1.181459 .2742066 4.31 0.000 .6440242 1.718894

gdp | .211475 .0751454 2.81 0.005 .0641927 .3587573

**delete this line** -------------+----------------------------------------------------------------

**/cut1** |

~~\_cons~~ | -.6449164 .3378168 -1.91 0.056 -1.307025 .0171923

**delete this line** -------------+----------------------------------------------------------------

**/cut2** |

~~\_cons~~ | .8283362 .3494298 2.37 0.018 .1434665 1.513206

-------------+----------------------------------------------------------------

~~rho n~~ **Corrrelation coefficients** |

~~\_cons~~ **rho(-)** | .681534 .333613 2.04 0.041 .0276645 1.335404

**delete this line** -------------+----------------------------------------------------------------

~~rho p~~ |

~~\_cons~~ **rho(+)** | .3677536 .6734798 0.55 0.585 -.9522424 1.68775

------------------------------------------------------------------------------