. // Model PS.Y.B.SP.V.2

**. eststo: logit dv\_indicator `count\_lag\_1\_vars' `covariates' ib(freq).state ib(freq).time, vce(cl mineid) offset(lnhours) iter(50) or**

note: sp75\_1400\_1\_1lag != 0 predicts success perfectly

sp75\_1400\_1\_1lag dropped and 7 obs not used

note: sp75\_1405\_1\_1lag != 0 predicts success perfectly

sp75\_1405\_1\_1lag dropped and 5 obs not used

note: sp75\_500\_1\_1lag != 0 predicts success perfectly

sp75\_500\_1\_1lag dropped and 6 obs not used

note: sp75\_508\_1\_1lag != 0 predicts success perfectly

sp75\_508\_1\_1lag dropped and 4 obs not used

note: sp75\_1003\_2\_1lag != 0 predicts success perfectly

sp75\_1003\_2\_1lag dropped and 25 obs not used

note: sp75\_1322\_1lag != 0 predicts success perfectly

sp75\_1322\_1lag dropped and 1 obs not used

note: sp75\_812\_1lag != 0 predicts success perfectly

sp75\_812\_1lag dropped and 21 obs not used

note: sp75\_1003\_1lag != 0 predicts success perfectly

sp75\_1003\_1lag dropped and 105 obs not used

note: sp75\_153\_1lag != 0 predicts success perfectly

sp75\_153\_1lag dropped and 5 obs not used

note: sp75\_343\_1lag != 0 predicts success perfectly

sp75\_343\_1lag dropped and 33 obs not used

note: sp48\_24\_1lag != 0 predicts success perfectly

sp48\_24\_1lag dropped and 1 obs not used

note: sp48\_4\_1lag != 0 predicts success perfectly

sp48\_4\_1lag dropped and 1 obs not used

note: sp75\_703\_4\_1lag != 0 predicts success perfectly

sp75\_703\_4\_1lag dropped and 1 obs not used

note: sp75\_155\_1lag != 0 predicts success perfectly

sp75\_155\_1lag dropped and 2 obs not used

note: sp75\_215\_1lag != 0 predicts success perfectly

sp75\_215\_1lag dropped and 3 obs not used

note: sp75\_156\_1lag != 0 predicts success perfectly

sp75\_156\_1lag dropped and 5 obs not used

note: sp75\_327\_1lag != 0 predicts success perfectly

sp75\_327\_1lag dropped and 2 obs not used

note: 17.state != 0 predicts success perfectly

17.state dropped and 11 obs not used

note: sp75\_510\_1lag omitted because of collinearity

Iteration 0: log pseudolikelihood = -1956.6801

Iteration 1: log pseudolikelihood = -1724.7734

Iteration 2: log pseudolikelihood = -1683.1116

Iteration 3: log pseudolikelihood = -1677.4639

Iteration 4: log pseudolikelihood = -1676.6697

Iteration 5: log pseudolikelihood = -1676.644

Iteration 6: log pseudolikelihood = -1676.6439

Logistic regression Number of obs = 6,015

Wald chi2(102) = .

Log pseudolikelihood = -1676.6439 Prob > chi2 = .

(Std. Err. adjusted for 1,236 clusters in mineid)

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

| Robust

dv\_indicator | Odds Ratio Std. Err. z P>|z| [95% Conf. Interval]

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

sp48\_11\_1lag | 1.517811 .4619499 1.37 0.170 .8358961 2.756026

sp75\_1311\_1lag | .6211414 .3963786 -0.75 0.456 .177828 2.169606

sp75\_1400\_1\_1lag | 1 (omitted)

sp75\_1404\_1\_1lag | .3625645 .349498 -1.05 0.293 .05481 2.398338

sp75\_1405\_1\_1lag | 1 (omitted)

sp75\_500\_1\_1lag | 1 (omitted)

sp75\_501\_1lag | .8032252 .2657567 -0.66 0.508 .4199592 1.53627

sp75\_506\_1\_1lag | 1.248297 .983068 0.28 0.778 .2666697 5.843356

sp75\_507\_1\_1lag | 1.086256 .1270438 0.71 0.479 .8637324 1.366108

sp75\_508\_1\_1lag | 1 (omitted)

sp75\_512\_1\_1lag | 1.76468 1.40793 0.71 0.477 .3694405 8.429223

sp75\_811\_1lag | 1.031364 .3578863 0.09 0.929 .5224474 2.036017

sp75\_1002\_1lag | 1.020883 .1942344 0.11 0.913 .703113 1.482267

sp75\_1003\_2\_1lag | 1 (omitted)

sp75\_1322\_1lag | 1 (omitted)

sp75\_1719\_2\_1lag | .5493773 .3680009 -0.89 0.371 .1478062 2.041967

sp75\_212\_1lag | 7.393138 5.313072 2.78 0.005 1.807647 30.23737

sp75\_332\_1lag | .40562 .1362069 -2.69 0.007 .2100325 .7833433

sp75\_501\_2\_1lag | .6874981 .1920813 -1.34 0.180 .397606 1.188749

sp75\_502\_1lag | .6123659 .6195471 -0.48 0.628 .0843 4.448305

sp75\_602\_1lag | 1.285181 .2827147 1.14 0.254 .8350583 1.977935

sp75\_812\_1lag | 1 (omitted)

sp75\_1003\_1lag | 1 (omitted)

sp75\_153\_1lag | 1 (omitted)

sp75\_203\_1lag | .9973539 .0536148 -0.05 0.961 .8976174 1.108172

sp75\_213\_1lag | 2.829003 6.677217 0.44 0.660 .0277055 288.8691

sp75\_343\_1lag | 1 (omitted)

sp75\_373\_1lag | .1171246 .1119374 -2.24 0.025 .0179947 .7623455

sp75\_503\_1lag | 1.002907 .0154657 0.19 0.851 .9730479 1.033682

sp75\_523\_1lag | .9019874 .0832408 -1.12 0.264 .7527426 1.080823

sp75\_523\_3\_1lag | .90353 .0338587 -2.71 0.007 .8395466 .9723897

sp75\_603\_1lag | .8943496 .2031409 -0.49 0.623 .5730163 1.395879

sp75\_703\_3\_1lag | 1.704016 .8997036 1.01 0.313 .6054071 4.796227

sp48\_24\_1lag | 1 (omitted)

sp48\_4\_1lag | 1 (omitted)

sp75\_1404\_1lag | .039464 .0375903 -3.39 0.001 .0061012 .2552639

sp75\_1719\_4\_1lag | .7035193 .1517867 -1.63 0.103 .4609209 1.073806

sp75\_204\_1lag | 1.193673 .1147487 1.84 0.066 .9886866 1.441159

sp75\_334\_1lag | .9318222 .182477 -0.36 0.718 .6348102 1.367799

sp75\_524\_1lag | .6801104 .5465175 -0.48 0.631 .140792 3.285345

sp75\_604\_1lag | 1.071552 .0427805 1.73 0.083 .9909003 1.158768

sp75\_703\_4\_1lag | 1 (omitted)

sp48\_25\_1lag | 1.065486 .5589775 0.12 0.904 .381056 2.97925

sp48\_5\_1lag | 1.006862 .4702378 0.01 0.988 .4031163 2.514833

sp75\_1315\_1lag | .4920134 .4568074 -0.76 0.445 .0797412 3.035784

sp75\_1403\_5\_1lag | .8312521 .1248148 -1.23 0.218 .6193305 1.115689

sp75\_1405\_1lag | 7.349996 5.01119 2.93 0.003 1.931711 27.96611

sp75\_155\_1lag | 1 (omitted)

sp75\_1725\_1lag | 1.042436 .0393772 1.10 0.271 .9680456 1.122543

sp75\_205\_1lag | .8625285 .6187073 -0.21 0.837 .2114419 3.518485

sp75\_215\_1lag | 1 (omitted)

sp75\_505\_1lag | 2.60234 2.726385 0.91 0.361 .3338785 20.28335

sp75\_605\_1lag | 1.178801 .1171103 1.66 0.098 .9702334 1.432204

sp48\_26\_1lag | 1.172764 .210375 0.89 0.374 .825123 1.666873

sp48\_6\_1lag | .7852039 .1446202 -1.31 0.189 .5472763 1.12657

sp75\_1316\_1lag | .7683185 .5807793 -0.35 0.727 .1746264 3.380436

sp75\_1403\_6\_1lag | 1.044915 .1435758 0.32 0.749 .7982196 1.367854

sp75\_156\_1lag | 1 (omitted)

sp75\_1906\_1lag | .7389823 .4716057 -0.47 0.636 .2115495 2.581405

sp75\_1916\_1lag | .40391 .4250162 -0.86 0.389 .0513575 3.176621

sp75\_606\_1lag | .8728909 .0473906 -2.50 0.012 .7847781 .9708967

sp75\_816\_1lag | .8177214 .123025 -1.34 0.181 .6088963 1.098164

sp75\_906\_1lag | .4979287 .4256121 -0.82 0.415 .0932373 2.65916

sp48\_27\_1lag | .7992309 .3953509 -0.45 0.651 .3031192 2.107323

sp48\_7\_1lag | 1.370277 .4367964 0.99 0.323 .7336268 2.559421

sp75\_1403\_7\_1lag | .6232109 .1979423 -1.49 0.137 .3344099 1.161424

sp75\_207\_1lag | 1.291994 .8046061 0.41 0.681 .3812097 4.378822

sp75\_327\_1lag | 1 (omitted)

sp75\_337\_1lag | 1.224367 .3331945 0.74 0.457 .7182389 2.087153

sp75\_507\_1lag | 1.050697 .3425445 0.15 0.879 .55459 1.990597

sp75\_607\_1lag | 1.095091 .2503857 0.40 0.691 .6995657 1.714242

sp75\_807\_1lag | 1.14304 .07642 2.00 0.046 1.002658 1.303077

sp75\_817\_1lag | .0757738 .0678175 -2.88 0.004 .0131128 .4378686

sp48\_28\_1lag | 1.499002 .7066265 0.86 0.390 .5950417 3.776217

sp48\_8\_1lag | 1.441718 .4968347 1.06 0.288 .7337448 2.832796

sp75\_1318\_1lag | .0027245 .0040123 -4.01 0.000 .000152 .0488459

sp75\_1403\_8\_1lag | 4.610809 6.111513 1.15 0.249 .3431867 61.94749

sp75\_208\_1lag | .8143087 .0602439 -2.78 0.005 .7043943 .9413743

sp75\_388\_1lag | 1.043667 .1920752 0.23 0.816 .727625 1.49698

sp75\_209\_1lag | 1.113789 .1976617 0.61 0.544 .7865788 1.577117

sp75\_389\_1lag | .6471415 .3091114 -0.91 0.362 .2537565 1.65037

sp75\_509\_1lag | 1.531782 .9249062 0.71 0.480 .4690641 5.002205

sp75\_100\_1lag | 1.847804 2.185295 0.52 0.604 .1819648 18.76396

sp75\_1400\_1lag | .6921085 .2996999 -0.85 0.395 .2961986 1.617206

sp75\_1403\_10\_1lag | 1.154992 .2744643 0.61 0.544 .7249456 1.840148

sp75\_160\_1lag | 1.78479 1.270844 0.81 0.416 .4420757 7.205726

sp75\_1720\_1lag | 1.0226 .1812936 0.13 0.900 .7224353 1.44748

sp75\_340\_1lag | 1.259876 .1911087 1.52 0.128 .9358586 1.696076

sp75\_500\_1lag | 1.030285 .2261603 0.14 0.892 .6700509 1.584187

sp75\_510\_1lag | 1 (omitted)

sp75\_810\_1lag | .7386249 .1095535 -2.04 0.041 .5522974 .9878133

mine\_time | 1.019357 .020228 0.97 0.334 .9804718 1.059784

onsite\_insp\_hours | 1.003614 .0004801 7.54 0.000 1.002673 1.004555

|

state |

1 | 1.078854 .8331998 0.10 0.922 .2374539 4.901695

2 | .60391 .1129877 -2.70 0.007 .4185216 .8714181

3 | 1.263585 .5384989 0.55 0.583 .5480876 2.913124

4 | 4.77082 3.379432 2.21 0.027 1.190257 19.12254

5 | .9224916 .4832523 -0.15 0.878 .330412 2.575544

6 | .5265396 .076093 -4.44 0.000 .3966609 .6989445

7 | 2.154537 2.505833 0.66 0.509 .2204777 21.05442

8 | .8842227 .1744012 -0.62 0.533 .6007219 1.301517

9 | .1601325 .0312948 -9.37 0.000 .1091763 .2348715

10 | .6897765 .28138 -0.91 0.363 .3100833 1.534399

11 | 2.653471 2.30618 1.12 0.262 .4830806 14.57502

12 | .5388243 .1186645 -2.81 0.005 .3499356 .8296714

13 | 2.020176 1.331838 1.07 0.286 .5549057 7.354603

14 | .4521664 .1947085 -1.84 0.065 .1944286 1.051566

15 | .6463414 .113354 -2.49 0.013 .4583318 .9114734

17 | 1 (empty)

|

time |

2000 | .9593038 .1857084 -0.21 0.830 .6564097 1.401966

2002 | .6487322 .1263369 -2.22 0.026 .4428929 .9502375

2003 | .8526306 .1968968 -0.69 0.490 .5422432 1.340688

2004 | .5177049 .1146068 -2.97 0.003 .3354655 .7989447

2005 | .4752973 .1025891 -3.45 0.001 .3113438 .7255885

2006 | .4999198 .1078765 -3.21 0.001 .3275078 .7630959

2007 | .3150777 .0723346 -5.03 0.000 .2009099 .4941218

2008 | .2173728 .049522 -6.70 0.000 .1390862 .3397242

2009 | .2570704 .0662573 -5.27 0.000 .1551184 .4260306

2010 | .1779103 .0454118 -6.76 0.000 .1078776 .2934074

2011 | .2296046 .0600778 -5.62 0.000 .1374856 .3834458

2012 | .1550317 .0398239 -7.26 0.000 .093706 .256492

2013 | .2257339 .0680762 -4.94 0.000 .1249954 .4076614

2014 | .1434084 .0433649 -6.42 0.000 .0792833 .2593983

2015 | .0985469 .0320396 -7.13 0.000 .0521075 .1863741

|

\_cons | .0001308 .0000243 -48.04 0.000 .0000908 .0001883

lnhours | 1 (offset)

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

Note: 0 failures and 71 successes completely determined.

(est1 stored)

**. lfit**

Logistic model for dv\_indicator, goodness-of-fit test

number of observations = 6015

number of covariate patterns = 6000

Pearson chi2(5894) = 5398.66

Prob > chi2 = 1.0000

**. linktest**

Iteration 0: log likelihood = -2783.686

Iteration 1: log likelihood = -1956.7618

Iteration 2: log likelihood = -1709.5724

Iteration 3: log likelihood = -1674.538

Iteration 4: log likelihood = -1668.369

Iteration 5: log likelihood = -1668.1943

Iteration 6: log likelihood = -1668.1943

Logistic regression Number of obs = 6,015

LR chi2(2) = 2230.98

Prob > chi2 = 0.0000

Log likelihood = -1668.1943 Pseudo R2 = 0.4007

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

dv\_indicator | Coef. Std. Err. z P>|z| [95% Conf. Interval]

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

\_hat | .9810385 .0417627 23.49 0.000 .8991851 1.062892

\_hatsq | .0601066 .0174115 3.45 0.001 .0259807 .0942325

\_cons | -.1269235 .0563721 -2.25 0.024 -.2374108 -.0164361

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

Note: 0 failures and 263 successes completely determined.

**. estat classification**

Logistic model for dv\_indicator

-------- True --------

Classified | D ~D | Total

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

+ | 4791 569 | 5360

- | 175 480 | 655

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

Total | 4966 1049 | 6015

Classified + if predicted Pr(D) >= .5

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

Sensitivity Pr( +| D) 96.48%

Specificity Pr( -|~D) 45.76%

Positive predictive value Pr( D| +) 89.38%

Negative predictive value Pr(~D| -) 73.28%

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

False + rate for true ~D Pr( +|~D) 54.24%

False - rate for true D Pr( -| D) 3.52%

False + rate for classified + Pr(~D| +) 10.62%

False - rate for classified - Pr( D| -) 26.72%

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

Correctly classified 87.63%

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

**. summ dv\_indicator bv2\_yhat**

Variable | Obs Mean Std. Dev. Min Max

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

dv\_indicator | 6,253 .8322405 .3736824 0 1

bv2\_yhat | 6,015 .8256027 .2318032 .0022208 1