. // Model SP.B.PP.1

**. eststo: logit MR\_indicator `subpart\_penalty\_point\_vars' `covariates' ib(freq).state ib(freq).time if sample\_pp == 1, vce(cl mineid) offset(lnhours) iter(50) or**

note: sp48\_24\_pp != 0 predicts failure perfectly

sp48\_24\_pp dropped and 1 obs not used

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

sp48\_4\_pp dropped and 1 obs not used

note: sp71\_701\_pp != 0 predicts failure perfectly

sp71\_701\_pp dropped and 1 obs not used

note: sp75\_1003\_1\_pp != 0 predicts success perfectly

sp75\_1003\_1\_pp dropped and 6 obs not used

note: sp75\_1101\_20\_pp != 0 predicts failure perfectly

sp75\_1101\_20\_pp dropped and 10 obs not used

note: sp75\_1401\_1\_pp != 0 predicts success perfectly

sp75\_1401\_1\_pp dropped and 1 obs not used

note: sp75\_1403\_11\_pp != 0 predicts success perfectly

sp75\_1403\_11\_pp dropped and 3 obs not used

note: sp75\_1403\_3\_pp != 0 predicts success perfectly

sp75\_1403\_3\_pp dropped and 2 obs not used

note: sp75\_1403\_4\_pp != 0 predicts success perfectly

sp75\_1403\_4\_pp dropped and 2 obs not used

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

sp75\_1405\_1\_pp dropped and 3 obs not used

note: sp75\_150\_pp != 0 predicts success perfectly

sp75\_150\_pp dropped and 5 obs not used

note: sp75\_1721\_pp != 0 predicts failure perfectly

sp75\_1721\_pp dropped and 4 obs not used

note: sp75\_1727\_pp != 0 predicts failure perfectly

sp75\_1727\_pp dropped and 1 obs not used

note: sp75\_519\_pp != 0 predicts success perfectly

sp75\_519\_pp dropped and 1 obs not used

note: sp75\_702\_1\_pp != 0 predicts success perfectly

sp75\_702\_1\_pp dropped and 2 obs not used

note: sp75\_703\_1\_pp != 0 predicts success perfectly

sp75\_703\_1\_pp dropped and 4 obs not used

note: sp75\_703\_4\_pp != 0 predicts failure perfectly

sp75\_703\_4\_pp dropped and 3 obs not used

note: sp75\_705\_3\_pp != 0 predicts failure perfectly

sp75\_705\_3\_pp dropped and 1 obs not used

note: sp75\_800\_2\_pp != 0 predicts failure perfectly

sp75\_800\_2\_pp dropped and 2 obs not used

note: sp75\_803\_2\_pp != 0 predicts success perfectly

sp75\_803\_2\_pp dropped and 3 obs not used

note: sp75\_806\_pp != 0 predicts success perfectly

sp75\_806\_pp dropped and 1 obs not used

note: sp75\_814\_pp != 0 predicts success perfectly

sp75\_814\_pp dropped and 12 obs not used

note: sp75\_834\_pp != 0 predicts failure perfectly

sp75\_834\_pp dropped and 1 obs not used

note: sp77\_103\_pp != 0 predicts failure perfectly

sp77\_103\_pp dropped and 1 obs not used

note: sp77\_1106\_pp != 0 predicts failure perfectly

sp77\_1106\_pp dropped and 3 obs not used

note: sp77\_1432\_pp != 0 predicts success perfectly

sp77\_1432\_pp dropped and 1 obs not used

note: sp77\_1438\_pp != 0 predicts failure perfectly

sp77\_1438\_pp dropped and 1 obs not used

note: sp77\_1802\_pp != 0 predicts failure perfectly

sp77\_1802\_pp dropped and 1 obs not used

note: sp77\_305\_pp != 0 predicts success perfectly

sp77\_305\_pp dropped and 1 obs not used

note: sp77\_309\_pp != 0 predicts success perfectly

sp77\_309\_pp dropped and 1 obs not used

note: sp77\_315\_pp != 0 predicts success perfectly

sp77\_315\_pp dropped and 1 obs not used

note: sp77\_403\_2\_pp != 0 predicts success perfectly

sp77\_403\_2\_pp dropped and 1 obs not used

note: sp77\_515\_pp != 0 predicts failure perfectly

sp77\_515\_pp dropped and 4 obs not used

note: sp77\_606\_1\_pp != 0 predicts success perfectly

sp77\_606\_1\_pp dropped and 1 obs not used

note: sp77\_701\_3\_pp != 0 predicts failure perfectly

sp77\_701\_3\_pp dropped and 4 obs not used

note: sp77\_704\_1\_pp != 0 predicts success perfectly

sp77\_704\_1\_pp dropped and 1 obs not used

note: sp77\_704\_9\_pp != 0 predicts failure perfectly

sp77\_704\_9\_pp dropped and 4 obs not used

note: sp77\_704\_pp != 0 predicts failure perfectly

sp77\_704\_pp dropped and 2 obs not used

note: sp77\_801\_pp != 0 predicts failure perfectly

sp77\_801\_pp dropped and 1 obs not used

note: sp77\_901\_1\_pp != 0 predicts failure perfectly

sp77\_901\_1\_pp dropped and 2 obs not used

note: sp77\_902\_2\_pp != 0 predicts failure perfectly

sp77\_902\_2\_pp dropped and 1 obs not used

note: sp75\_1001\_pp omitted because of collinearity

note: sp75\_1106\_6\_pp omitted because of collinearity

note: sp75\_1431\_pp omitted because of collinearity

note: sp75\_511\_1\_pp omitted because of collinearity

note: sp77\_413\_pp omitted because of collinearity

note: sp77\_606\_pp omitted because of collinearity

note: sp77\_804\_pp omitted because of collinearity

Iteration 0: log pseudolikelihood = -6571.1275

Iteration 1: log pseudolikelihood = -6103.0833

Iteration 2: log pseudolikelihood = -6093.79

Iteration 3: log pseudolikelihood = -6093.7032

Iteration 4: log pseudolikelihood = -6093.703

Logistic regression Number of obs = 14,794

Wald chi2(319) = .

Log pseudolikelihood = -6093.703 Prob > chi2 = .

(Std. Err. adjusted for 878 clusters in mineid)

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| Robust

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

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

sp47\_41\_pp | .9997789 .002213 -0.10 0.920 .995451 1.004126

sp47\_42\_pp | .9917444 .0042386 -1.94 0.052 .9834716 1.000087

sp47\_44\_pp | .9945237 .0042444 -1.29 0.198 .9862396 1.002877

sp48\_11\_pp | 1.002179 .0026261 0.83 0.406 .9970451 1.007339

sp48\_24\_pp | 1 (omitted)

sp48\_25\_pp | .9896272 .0046518 -2.22 0.027 .9805518 .9987867

sp48\_26\_pp | 1.00374 .002797 1.34 0.180 .9982726 1.009237

sp48\_27\_pp | 1.000255 .0028032 0.09 0.927 .9947762 1.005765

sp48\_28\_pp | 1.003226 .0045487 0.71 0.478 .9943498 1.012181

sp48\_4\_pp | 1 (omitted)

sp48\_5\_pp | 1.003352 .0057012 0.59 0.556 .9922397 1.014588

sp48\_6\_pp | 1.000322 .0020974 0.15 0.878 .9962192 1.004441

sp48\_7\_pp | .9974484 .0022576 -1.13 0.259 .9930334 1.001883

sp48\_8\_pp | 1.0014 .0041555 0.34 0.736 .9932887 1.009578

sp71\_701\_pp | 1 (omitted)

sp72\_503\_pp | .995683 .0027932 -1.54 0.123 .9902234 1.001173

sp72\_610\_pp | .9971227 .0133572 -0.22 0.830 .9712839 1.023649

sp72\_620\_pp | .9965775 .0179488 -0.19 0.849 .9620122 1.032385

sp72\_630\_pp | 1.000304 .0003839 0.79 0.429 .9995516 1.001057

sp75\_100\_pp | .9997979 .0066398 -0.03 0.976 .9868685 1.012897

sp75\_1001\_1\_pp | 1.002063 .0051217 0.40 0.687 .9920744 1.012151

sp75\_1001\_pp | 1 (omitted)

sp75\_1003\_1\_pp | 1 (omitted)

sp75\_1100\_2\_pp | 1.000554 .0003739 1.48 0.138 .9998215 1.001287

sp75\_1101\_20\_pp | 1 (omitted)

sp75\_1102\_pp | 1.000758 .0021486 0.35 0.724 .9965556 1.004978

sp75\_1103\_4\_pp | 1.000284 .0005808 0.49 0.625 .9991462 1.001423

sp75\_1104\_pp | 1.002406 .002467 0.98 0.329 .9975824 1.007253

sp75\_1106\_2\_pp | 1.003681 .002112 1.75 0.081 .9995501 1.007829

sp75\_1106\_3\_pp | 1.000897 .000709 1.27 0.206 .9995083 1.002287

sp75\_1106\_4\_pp | 1.000135 .0044961 0.03 0.976 .9913616 1.008986

sp75\_1106\_5\_pp | .999132 .002208 -0.39 0.694 .9948137 1.003469

sp75\_1106\_6\_pp | 1 (omitted)

sp75\_1106\_pp | 1.003829 .0058019 0.66 0.508 .9925219 1.015265

sp75\_1107\_14\_pp | 1.015178 .0147701 1.04 0.301 .9866375 1.044543

sp75\_1400\_1\_pp | .9910103 .0127543 -0.70 0.483 .966325 1.016326

sp75\_1400\_2\_pp | .9983339 .006855 -0.24 0.808 .9849882 1.01186

sp75\_1400\_3\_pp | .9997317 .0028045 -0.10 0.924 .9942501 1.005244

sp75\_1400\_4\_pp | .9932763 .0059321 -1.13 0.259 .9817174 1.004971

sp75\_1400\_pp | .9964936 .0038245 -0.92 0.360 .9890258 1.004018

sp75\_1401\_1\_pp | 1 (omitted)

sp75\_1401\_pp | .9677324 .0139766 -2.27 0.023 .9407228 .9955174

sp75\_1403\_10\_pp | 1.001079 .0016126 0.67 0.503 .9979233 1.004245

sp75\_1403\_11\_pp | 1 (omitted)

sp75\_1403\_3\_pp | 1 (omitted)

sp75\_1403\_4\_pp | 1 (omitted)

sp75\_1403\_5\_pp | 1.000033 .0009502 0.03 0.973 .998172 1.001897

sp75\_1403\_6\_pp | .9993878 .0006622 -0.92 0.355 .9980908 1.000686

sp75\_1403\_7\_pp | .998012 .0027956 -0.71 0.477 .9925477 1.003506

sp75\_1403\_8\_pp | .9998043 .0007958 -0.25 0.806 .9982458 1.001365

sp75\_1403\_9\_pp | .9998425 .0042745 -0.04 0.971 .9914997 1.008255

sp75\_1404\_1\_pp | .9791027 .011831 -1.75 0.081 .9561868 1.002568

sp75\_1404\_pp | 1.013246 .0105888 1.26 0.208 .9927035 1.034214

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

sp75\_1405\_pp | .9984373 .0010442 -1.50 0.135 .9963929 1.000486

sp75\_1431\_pp | 1 (omitted)

sp75\_1432\_pp | .9954808 .0113985 -0.40 0.692 .973389 1.018074

sp75\_1433\_pp | 1.0009 .0040126 0.22 0.822 .9930665 1.008796

sp75\_1434\_pp | 1.000487 .0081062 0.06 0.952 .9847245 1.016501

sp75\_1435\_pp | .975955 .009696 -2.45 0.014 .9571351 .9951449

sp75\_1437\_pp | 1.002273 .0151827 0.15 0.881 .9729533 1.032477

sp75\_150\_pp | 1 (omitted)

sp75\_151\_pp | 1.021355 .0125207 1.72 0.085 .9971077 1.046193

sp75\_153\_pp | 1.003477 .0081486 0.43 0.669 .987632 1.019575

sp75\_156\_pp | 1.028728 .0134528 2.17 0.030 1.002696 1.055436

sp75\_160\_pp | .9870904 .0176051 -0.73 0.466 .9531811 1.022206

sp75\_1600\_2\_pp | .9994189 .0012721 -0.46 0.648 .9969286 1.001915

sp75\_1712\_10\_pp | .9977215 .00316 -0.72 0.471 .9915472 1.003934

sp75\_1712\_6\_pp | 1.002065 .0024576 0.84 0.400 .9972596 1.006893

sp75\_1720\_pp | .9978592 .0013516 -1.58 0.114 .9952135 1.000512

sp75\_1721\_pp | 1 (omitted)

sp75\_1725\_pp | 1.000318 .0002453 1.30 0.195 .999837 1.000799

sp75\_1726\_pp | 1.009175 .0050127 1.84 0.066 .9993976 1.019047

sp75\_1727\_pp | 1 (omitted)

sp75\_1728\_pp | 1.023744 .0127715 1.88 0.060 .9990164 1.049085

sp75\_1729\_pp | .9943557 .006575 -0.86 0.392 .9815522 1.007326

sp75\_1730\_pp | .9936191 .0061167 -1.04 0.298 .9817027 1.00568

sp75\_1731\_pp | .9996345 .0001604 -2.28 0.023 .9993202 .999949

sp75\_1903\_pp | 1.006735 .0038998 1.73 0.083 .9991209 1.014408

sp75\_1909\_pp | 1.000165 .0003975 0.42 0.677 .9993866 1.000945

sp75\_1910\_pp | 1.000635 .0006393 0.99 0.321 .9993826 1.001889

sp75\_1911\_pp | .9997782 .0007853 -0.28 0.778 .9982402 1.001319

sp75\_1912\_pp | .9965587 .0042966 -0.80 0.424 .988173 1.005016

sp75\_1913\_pp | .9934981 .0072391 -0.90 0.371 .9794105 1.007788

sp75\_1914\_pp | .9998763 .0004618 -0.27 0.789 .9989716 1.000782

sp75\_1915\_pp | 1.001837 .0059864 0.31 0.759 .990172 1.013639

sp75\_202\_pp | 1.000204 .0001204 1.70 0.090 .9999683 1.00044

sp75\_208\_pp | .9995801 .0009509 -0.44 0.659 .9977181 1.001446

sp75\_211\_pp | .9992649 .0007372 -1.00 0.319 .997821 1.000711

sp75\_212\_pp | .9978262 .001916 -1.13 0.257 .9940779 1.001589

sp75\_214\_pp | 1.001677 .0016798 1.00 0.318 .9983904 1.004975

sp75\_312\_pp | .9993736 .0014927 -0.42 0.675 .9964524 1.002303

sp75\_320\_pp | .9995487 .0008552 -0.53 0.598 .9978738 1.001226

sp75\_324\_pp | 1.001622 .002897 0.56 0.575 .9959605 1.007317

sp75\_337\_pp | 1.000875 .0013838 0.63 0.527 .9981666 1.003591

sp75\_340\_pp | 1.000586 .0006805 0.86 0.389 .9992534 1.001921

sp75\_341\_pp | .9890139 .0215702 -0.51 0.612 .947628 1.032207

sp75\_342\_pp | 1.000106 .0003681 0.29 0.773 .999385 1.000828

sp75\_344\_pp | 1.003059 .0055696 0.55 0.582 .9922016 1.014034

sp75\_352\_pp | .9935079 .0033367 -1.94 0.052 .9869895 1.000069

sp75\_382\_pp | .9935936 .0026703 -2.39 0.017 .9883736 .9988411

sp75\_503\_pp | 1.000285 .0001619 1.76 0.078 .9999678 1.000603

sp75\_504\_pp | .9968878 .0033871 -0.92 0.359 .9902712 1.003549

sp75\_505\_pp | .9998928 .0069437 -0.02 0.988 .9863756 1.013595

sp75\_506\_1\_pp | 1.009404 .0044928 2.10 0.035 1.000637 1.018249

sp75\_506\_pp | .9975655 .0033397 -0.73 0.467 .9910412 1.004133

sp75\_507\_pp | .9995103 .0018725 -0.26 0.794 .9958469 1.003187

sp75\_511\_1\_pp | 1 (omitted)

sp75\_511\_pp | .9991922 .0018695 -0.43 0.666 .9955347 1.002863

sp75\_512\_1\_pp | .9963864 .0238672 -0.15 0.880 .9506887 1.044281

sp75\_512\_2\_pp | 1.000852 .0007434 1.15 0.251 .9993963 1.00231

sp75\_512\_pp | 1.00008 .0002062 0.39 0.697 .9996761 1.000485

sp75\_513\_1\_pp | 1.006092 .0064537 0.95 0.344 .9935219 1.018821

sp75\_513\_pp | .9924927 .0037102 -2.02 0.044 .9852474 .9997912

sp75\_514\_pp | 1.000809 .0007823 1.03 0.301 .9992766 1.002343

sp75\_515\_pp | .9989648 .0005624 -1.84 0.066 .9978631 1.000068

sp75\_516\_1\_pp | 1.004055 .0085134 0.48 0.633 .987507 1.02088

sp75\_516\_2\_pp | 1.002841 .0013749 2.07 0.038 1.00015 1.00554

sp75\_516\_pp | .9996519 .0008007 -0.43 0.664 .9980838 1.001222

sp75\_517\_1\_pp | 1.012118 .008684 1.40 0.160 .9952403 1.029283

sp75\_517\_pp | .9996894 .0001812 -1.71 0.087 .9993342 1.000045

sp75\_518\_1\_pp | .999922 .0009913 -0.08 0.937 .9979809 1.001867

sp75\_518\_pp | 1.001331 .0008053 1.65 0.098 .9997535 1.00291

sp75\_519\_pp | 1 (omitted)

sp75\_520\_pp | 1.002762 .0018071 1.53 0.126 .9992266 1.00631

sp75\_523\_1\_pp | .9986232 .0016836 -0.82 0.414 .9953288 1.001929

sp75\_523\_2\_pp | .9979486 .0013701 -1.50 0.135 .9952668 1.000638

sp75\_523\_pp | 1.000972 .0019555 0.50 0.619 .9971466 1.004812

sp75\_600\_1\_pp | .9950371 .0058998 -0.84 0.401 .9835407 1.006668

sp75\_600\_pp | 1.007404 .0174851 0.43 0.671 .9737106 1.042264

sp75\_601\_1\_pp | .9996084 .000557 -0.70 0.482 .9985174 1.000701

sp75\_601\_2\_pp | 1.009464 .0106654 0.89 0.373 .9887747 1.030585

sp75\_601\_3\_pp | 1.007589 .016379 0.47 0.642 .9759925 1.040208

sp75\_601\_pp | 1.000606 .0008055 0.75 0.452 .9990283 1.002186

sp75\_602\_pp | .9973238 .0025183 -1.06 0.289 .9924002 1.002272

sp75\_603\_pp | .9990313 .0024193 -0.40 0.689 .9943008 1.003784

sp75\_604\_pp | 1.000491 .0002991 1.64 0.101 .9999046 1.001077

sp75\_605\_pp | 1.000623 .0009462 0.66 0.510 .9987703 1.002479

sp75\_606\_pp | 1.000702 .000507 1.39 0.166 .9997093 1.001697

sp75\_607\_pp | 1.001065 .002109 0.51 0.613 .9969404 1.005208

sp75\_700\_1\_pp | 1.003812 .0086867 0.44 0.660 .98693 1.020983

sp75\_700\_pp | .9989746 .0032553 -0.31 0.753 .9926147 1.005375

sp75\_701\_1\_pp | 1.000364 .0035566 0.10 0.918 .9934175 1.007359

sp75\_701\_2\_pp | .9986256 .0036976 -0.37 0.710 .9914046 1.005899

sp75\_701\_3\_pp | 1.000088 .0058787 0.02 0.988 .9886323 1.011677

sp75\_701\_4\_pp | 1.007056 .0075648 0.94 0.349 .9923381 1.021992

sp75\_701\_5\_pp | .9947498 .0062799 -0.83 0.404 .9825173 1.007135

sp75\_701\_pp | 1.000336 .0006099 0.55 0.581 .9991416 1.001532

sp75\_702\_1\_pp | 1 (omitted)

sp75\_702\_pp | 1.012964 .0183912 0.71 0.478 .9775515 1.049659

sp75\_703\_1\_pp | 1 (omitted)

sp75\_703\_2\_pp | 1.012983 .011267 1.16 0.246 .9911394 1.035309

sp75\_703\_3\_pp | .9919634 .0038244 -2.09 0.036 .9844959 .9994876

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

sp75\_703\_pp | 1.003409 .001434 2.38 0.017 1.000602 1.006223

sp75\_704\_pp | 1.009084 .0061174 1.49 0.136 .9971653 1.021146

sp75\_705\_1\_pp | 1.006066 .0083922 0.72 0.468 .9897509 1.022649

sp75\_705\_3\_pp | 1 (omitted)

sp75\_705\_8\_pp | 1.003044 .0119432 0.26 0.799 .9799068 1.026727

sp75\_705\_pp | 1.011893 .0111267 1.08 0.282 .990318 1.033937

sp75\_706\_pp | .9997232 .0034581 -0.08 0.936 .9929683 1.006524

sp75\_800\_2\_pp | 1 (omitted)

sp75\_800\_3\_pp | .9968025 .006364 -0.50 0.616 .984407 1.009354

sp75\_800\_4\_pp | 1.003633 .0042768 0.85 0.395 .9952859 1.012051

sp75\_800\_pp | .9993553 .0039376 -0.16 0.870 .9916674 1.007103

sp75\_801\_pp | 1.003536 .0101081 0.35 0.726 .9839193 1.023545

sp75\_802\_pp | .9999151 .0073725 -0.01 0.991 .9855691 1.01447

sp75\_803\_2\_pp | 1 (omitted)

sp75\_803\_pp | 1.002866 .004244 0.68 0.499 .9945825 1.011219

sp75\_804\_pp | .9950556 .0054359 -0.91 0.364 .9844583 1.005767

sp75\_805\_pp | .9995921 .0072815 -0.06 0.955 .985422 1.013966

sp75\_806\_pp | 1 (omitted)

sp75\_807\_pp | .9996505 .0005655 -0.62 0.537 .9985427 1.000759

sp75\_808\_pp | .997791 .0035424 -0.62 0.533 .9908722 1.004758

sp75\_809\_pp | .9971915 .0013722 -2.04 0.041 .9945055 .9998846

sp75\_810\_pp | .9963641 .0019852 -1.83 0.068 .9924808 1.000263

sp75\_811\_pp | .9988096 .0017926 -0.66 0.507 .9953024 1.002329

sp75\_812\_pp | .9996938 .0074252 -0.04 0.967 .9852461 1.014353

sp75\_814\_pp | 1 (omitted)

sp75\_815\_pp | .995883 .0050166 -0.82 0.413 .9860991 1.005764

sp75\_816\_pp | 1.000852 .0013744 0.62 0.535 .9981621 1.00355

sp75\_818\_pp | 1.009717 .0150798 0.65 0.517 .9805891 1.039709

sp75\_820\_pp | 1.020449 .0117671 1.76 0.079 .9976446 1.043775

sp75\_821\_pp | 1.010082 .0051877 1.95 0.051 .9999658 1.020301

sp75\_825\_pp | .9948134 .0040487 -1.28 0.201 .9869098 1.00278

sp75\_827\_pp | 1.004455 .0071367 0.63 0.532 .9905639 1.01854

sp75\_831\_pp | 1.003759 .0077972 0.48 0.629 .9885927 1.019158

sp75\_832\_pp | .9971199 .0202619 -0.14 0.887 .9581876 1.037634

sp75\_834\_pp | 1 (omitted)

sp75\_900\_2\_pp | 1.008948 .0113458 0.79 0.428 .9869534 1.031432

sp75\_900\_3\_pp | .9954479 .0034659 -1.31 0.190 .9886779 1.002264

sp75\_900\_4\_pp | 1.000595 .00174 0.34 0.732 .9971903 1.004011

sp75\_900\_pp | 1.00031 .0010726 0.29 0.773 .9982098 1.002414

sp75\_901\_pp | 1.002026 .0038973 0.52 0.603 .9944162 1.009693

sp75\_902\_1\_pp | .9974149 .0138891 -0.19 0.853 .970561 1.025012

sp75\_902\_2\_pp | 1.002726 .0032924 0.83 0.407 .9962941 1.0092

sp75\_902\_4\_pp | .9998355 .0021439 -0.08 0.939 .9956423 1.004046

sp75\_902\_pp | .9988051 .0010281 -1.16 0.245 .996792 1.000822

sp75\_903\_pp | 1.002427 .0015312 1.59 0.113 .9994298 1.005432

sp75\_904\_pp | 1 .0005177 0.00 1.000 .998986 1.001016

sp75\_905\_pp | 1.010543 .0068144 1.56 0.120 .997275 1.023988

sp75\_907\_pp | .9950464 .0033741 -1.46 0.143 .9884551 1.001682

sp77\_103\_pp | 1 (omitted)

sp77\_104\_pp | 1.008308 .0349844 0.24 0.812 .9420197 1.079262

sp77\_1103\_pp | .9983687 .0012817 -1.27 0.203 .9958598 1.000884

sp77\_1104\_pp | .9996544 .000583 -0.59 0.553 .9985124 1.000798

sp77\_1106\_pp | 1 (omitted)

sp77\_1111\_pp | .9851753 .0177532 -0.83 0.407 .950987 1.020593

sp77\_1112\_pp | 1.001912 .0035105 0.55 0.586 .9950555 1.008816

sp77\_1403\_pp | 1.003834 .0046769 0.82 0.411 .9947094 1.013043

sp77\_1432\_pp | 1 (omitted)

sp77\_1433\_pp | 1.00045 .0094054 0.05 0.962 .9821845 1.019055

sp77\_1434\_pp | 1.00879 .0063595 1.39 0.165 .9964025 1.021332

sp77\_1437\_pp | .9905434 .0105385 -0.89 0.372 .9701022 1.011415

sp77\_1438\_pp | 1 (omitted)

sp77\_1605\_pp | .9996579 .0005556 -0.62 0.538 .9985695 1.000747

sp77\_1606\_pp | 1.000737 .000769 0.96 0.337 .9992315 1.002246

sp77\_1710\_pp | .9993289 .0013203 -0.51 0.611 .9967444 1.00192

sp77\_1802\_pp | 1 (omitted)

sp77\_1906\_pp | .9820765 .0160537 -1.11 0.269 .9511106 1.014051

sp77\_1915\_pp | .9928449 .0062208 -1.15 0.252 .980727 1.005113

sp77\_1916\_pp | 1.041603 .009042 4.70 0.000 1.024031 1.059476

sp77\_200\_pp | .9993065 .0012023 -0.58 0.564 .9969529 1.001666

sp77\_202\_pp | .9977318 .0010041 -2.26 0.024 .9957658 .9997016

sp77\_203\_pp | 1.008168 .0065181 1.26 0.208 .9954733 1.021025

sp77\_204\_pp | .9972361 .0021692 -1.27 0.203 .9929937 1.001497

sp77\_205\_pp | 1.001534 .0006626 2.32 0.020 1.000236 1.002834

sp77\_206\_pp | 1.00425 .0026924 1.58 0.114 .9989873 1.009541

sp77\_207\_pp | 1.001953 .0017865 1.09 0.274 .9984577 1.005461

sp77\_208\_pp | 1.00266 .0009421 2.83 0.005 1.000816 1.004508

sp77\_210\_pp | .9966242 .0040364 -0.83 0.404 .9887442 1.004567

sp77\_216\_pp | 1.006768 .006373 1.07 0.287 .9943542 1.019337

sp77\_305\_pp | 1 (omitted)

sp77\_309\_pp | 1 (omitted)

sp77\_314\_pp | .978569 .0125658 -1.69 0.092 .9542478 1.00351

sp77\_315\_pp | 1 (omitted)

sp77\_400\_pp | .9999087 .0007173 -0.13 0.899 .9985038 1.001316

sp77\_401\_pp | .9989595 .0033073 -0.31 0.753 .9924983 1.005463

sp77\_402\_pp | .9983885 .0025627 -0.63 0.530 .9933784 1.003424

sp77\_403\_1\_pp | .9993975 .0038134 -0.16 0.874 .9919513 1.0069

sp77\_403\_2\_pp | 1 (omitted)

sp77\_403\_pp | 1.012929 .0092786 1.40 0.161 .9949055 1.031279

sp77\_404\_pp | .9997586 .000475 -0.51 0.611 .998828 1.00069

sp77\_405\_pp | 1.002061 .0039329 0.52 0.600 .9943824 1.009799

sp77\_408\_pp | 1.009228 .0056014 1.66 0.098 .9983089 1.020266

sp77\_409\_pp | .9643277 .0125465 -2.79 0.005 .9400479 .9892346

sp77\_410\_pp | 1.001012 .000962 1.05 0.292 .9991285 1.002899

sp77\_411\_pp | .9779266 .0202248 -1.08 0.280 .9390793 1.018381

sp77\_412\_pp | 1.008571 .0048584 1.77 0.076 .999093 1.018138

sp77\_413\_pp | 1 (omitted)

sp77\_500\_pp | 1.014347 .0067258 2.15 0.032 1.00125 1.027616

sp77\_501\_pp | 1.00044 .0056313 0.08 0.938 .9894633 1.011538

sp77\_502\_1\_pp | 1.051116 .0220725 2.37 0.018 1.008733 1.09528

sp77\_502\_2\_pp | 1.001235 .0031175 0.40 0.692 .9951439 1.007364

sp77\_502\_pp | .9996667 .0005868 -0.57 0.570 .9985171 1.000817

sp77\_503\_1\_pp | 1.005051 .0101179 0.50 0.617 .985415 1.025079

sp77\_503\_pp | .9996689 .006034 -0.05 0.956 .9879122 1.011565

sp77\_504\_pp | .9954345 .0020766 -2.19 0.028 .9913728 .9995129

sp77\_505\_pp | .9991739 .0010635 -0.78 0.437 .9970916 1.001261

sp77\_506\_1\_pp | 1.001427 .0015148 0.94 0.346 .998462 1.0044

sp77\_506\_pp | .9937123 .003177 -1.97 0.049 .9875049 .9999587

sp77\_507\_pp | .9937023 .0074681 -0.84 0.401 .9791724 1.008448

sp77\_508\_1\_pp | 1.00384 .0101753 0.38 0.705 .9840935 1.023982

sp77\_508\_pp | .9974873 .0047017 -0.53 0.594 .9883145 1.006745

sp77\_509\_pp | 1.00057 .0025839 0.22 0.825 .9955185 1.005647

sp77\_510\_pp | 1.009696 .0151642 0.64 0.521 .9804075 1.039859

sp77\_511\_pp | .983338 .0089093 -1.85 0.064 .9660303 1.000956

sp77\_512\_pp | 1.000589 .0010057 0.59 0.558 .9986194 1.002562

sp77\_513\_pp | 1.000948 .001506 0.63 0.529 .9980012 1.003904

sp77\_514\_pp | .970212 .0096199 -3.05 0.002 .9515393 .989251

sp77\_515\_pp | 1 (omitted)

sp77\_516\_pp | 1.001073 .0008519 1.26 0.208 .9994044 1.002744

sp77\_600\_pp | 1.007235 .006018 1.21 0.228 .9955088 1.019099

sp77\_601\_pp | 1.000173 .0093382 0.02 0.985 .9820374 1.018644

sp77\_602\_pp | .9968856 .0127197 -0.24 0.807 .9722646 1.02213

sp77\_603\_pp | 1.010119 .0108151 0.94 0.347 .9891427 1.03154

sp77\_604\_pp | .9967945 .0047437 -0.67 0.500 .9875403 1.006135

sp77\_605\_pp | .988073 .0173279 -0.68 0.494 .954688 1.022626

sp77\_606\_1\_pp | 1 (omitted)

sp77\_606\_pp | 1 (omitted)

sp77\_700\_1\_pp | 1.025778 .0110756 2.36 0.018 1.004298 1.047717

sp77\_700\_pp | .9954765 .0058997 -0.76 0.444 .9839802 1.007107

sp77\_701\_1\_pp | .9942605 .0080464 -0.71 0.477 .9786142 1.010157

sp77\_701\_2\_pp | .998965 .003757 -0.28 0.783 .9916285 1.006356

sp77\_701\_3\_pp | 1 (omitted)

sp77\_701\_4\_pp | .9934104 .0078932 -0.83 0.405 .9780599 1.009002

sp77\_701\_pp | 1.001819 .0018145 1.00 0.316 .9982694 1.005382

sp77\_703\_pp | 1.02722 .0155974 1.77 0.077 .9971002 1.05825

sp77\_704\_1\_pp | 1 (omitted)

sp77\_704\_8\_pp | .9888717 .0087446 -1.27 0.206 .9718803 1.00616

sp77\_704\_9\_pp | 1 (omitted)

sp77\_704\_pp | 1 (omitted)

sp77\_705\_pp | .997817 .0031437 -0.69 0.488 .9916745 1.003998

sp77\_800\_1\_pp | 1.001389 .0090923 0.15 0.878 .9837266 1.01937

sp77\_800\_2\_pp | .9971036 .0056399 -0.51 0.608 .9861106 1.008219

sp77\_800\_pp | 1.005549 .0125232 0.44 0.657 .981301 1.030396

sp77\_801\_pp | 1 (omitted)

sp77\_802\_pp | .9707108 .0090655 -3.18 0.001 .9531044 .9886423

sp77\_803\_pp | .9999068 .0125285 -0.01 0.994 .9756506 1.024766

sp77\_804\_pp | 1 (omitted)

sp77\_805\_pp | 1.00197 .0139805 0.14 0.888 .9749398 1.029749

sp77\_807\_1\_pp | .9969231 .0112162 -0.27 0.784 .9751804 1.019151

sp77\_807\_2\_pp | 1.002577 .0114011 0.23 0.821 .9804789 1.025174

sp77\_807\_3\_pp | .9952892 .0052874 -0.89 0.374 .9849798 1.005706

sp77\_807\_pp | 1.006542 .0072965 0.90 0.368 .9923423 1.020945

sp77\_808\_pp | 1.001536 .0159167 0.10 0.923 .9708208 1.033223

sp77\_809\_pp | .9948043 .0029608 -1.75 0.080 .9890182 1.000624

sp77\_810\_pp | 1.006349 .0068835 0.93 0.355 .992948 1.019932

sp77\_900\_1\_pp | 1.021165 .0154697 1.38 0.167 .9912911 1.05194

sp77\_900\_2\_pp | 1.00475 .0047582 1.00 0.317 .9954669 1.014119

sp77\_900\_pp | 1.00003 .0055692 0.01 0.996 .9891738 1.011005

sp77\_901\_1\_pp | 1 (omitted)

sp77\_901\_pp | 1.004797 .006544 0.73 0.462 .9920529 1.017706

sp77\_902\_2\_pp | 1 (omitted)

sp77\_902\_3\_pp | 1.015638 .0107267 1.47 0.142 .9948297 1.036881

sp77\_902\_pp | 1.003209 .0055696 0.58 0.564 .9923517 1.014185

sp77\_903\_pp | .9913321 .0136675 -0.63 0.528 .9649031 1.018485

sp77\_904\_pp | .9965177 .001704 -2.04 0.041 .9931835 .9998632

mine\_time | .997984 .0023209 -0.87 0.386 .9934456 1.002543

onsite\_insp\_hours | 1.000929 .0002768 3.36 0.001 1.000386 1.001471

|

state |

AL | 2.129669 .5339502 3.02 0.003 1.302864 3.48117

AR | 2.35634 .2474606 8.16 0.000 1.917987 2.894879

CO | .7651835 .1578482 -1.30 0.194 .5107083 1.146458

IL | 1.361198 .245963 1.71 0.088 .9552405 1.93968

IN | .9491002 .2625195 -0.19 0.850 .5519137 1.632123

KY | .9048475 .0720162 -1.26 0.209 .7741566 1.057601

MD | 1.270748 .2836795 1.07 0.283 .8204245 1.968249

MT | .4736321 .0692996 -5.11 0.000 .3555472 .6309354

NM | 1.384014 .2138717 2.10 0.035 1.022361 1.873599

OH | .7347176 .2001869 -1.13 0.258 .4307203 1.253272

OK | .7416991 .4555142 -0.49 0.627 .222568 2.471683

PA | .9618648 .1399252 -0.27 0.789 .7232482 1.279207

TN | 1.383665 .2573231 1.75 0.081 .9610176 1.99219

UT | .552402 .1623593 -2.02 0.043 .3105091 .9827345

VA | .6752833 .0720981 -3.68 0.000 .5477793 .8324658

WY | 2.223596 .3910556 4.54 0.000 1.575282 3.138727

|

time |

2007 | 1.592766 .2842855 2.61 0.009 1.122599 2.259847

2007.25 | 1.314763 .2388558 1.51 0.132 .9208902 1.877098

2007.5 | 1.63757 .2983981 2.71 0.007 1.14576 2.340485

2007.75 | 1.473664 .2659743 2.15 0.032 1.034592 2.099073

2008 | 1.226892 .2191371 1.14 0.252 .8645141 1.741169

2008.25 | 1.326728 .2565732 1.46 0.144 .9081754 1.93818

2008.5 | 1.246813 .2262125 1.22 0.224 .8737068 1.77925

2009 | .9907998 .1815787 -0.05 0.960 .691816 1.418996

2009.25 | .9883894 .1895978 -0.06 0.951 .6786508 1.439494

2009.5 | 1.138452 .2151121 0.69 0.493 .7861021 1.648733

2009.75 | .9280335 .1838195 -0.38 0.706 .6294519 1.368248

2010 | .9645714 .1821347 -0.19 0.849 .6662032 1.396568

2010.25 | 1.049183 .2006617 0.25 0.802 .7211984 1.526329

2010.5 | 1.313102 .259185 1.38 0.168 .8918365 1.933356

2010.75 | 1.029606 .1933326 0.16 0.877 .7125876 1.487662

2011 | 1.258062 .2311755 1.25 0.212 .8775848 1.803494

2011.25 | 1.221143 .2245866 1.09 0.277 .851565 1.751118

2011.5 | 1.448951 .2609803 2.06 0.040 1.017977 2.062383

2011.75 | .9743788 .1811955 -0.14 0.889 .6767657 1.40287

2012 | 1.312053 .2349506 1.52 0.129 .9236895 1.863704

2012.25 | 1.182912 .2292988 0.87 0.386 .8090086 1.729624

2012.5 | 1.369018 .2627666 1.64 0.102 .9397905 1.994284

2012.75 | .8555535 .1724134 -0.77 0.439 .5763825 1.269941

2013 | .8832799 .1694196 -0.65 0.518 .6065012 1.286368

2013.25 | .728008 .1515097 -1.53 0.127 .4841589 1.094673

2013.5 | .9481555 .1985026 -0.25 0.799 .6290351 1.429171

2013.75 | 1.062288 .2206497 0.29 0.771 .70703 1.596052

2014 | .6335876 .1305952 -2.21 0.027 .4230161 .9489786

2014.25 | .8302876 .1759469 -0.88 0.380 .5480873 1.257788

2014.5 | .9435094 .1898292 -0.29 0.773 .6360466 1.399599

2014.75 | .966693 .1990573 -0.16 0.869 .6456732 1.44732

2015 | 1.006435 .2136936 0.03 0.976 .6638231 1.525875

2015.25 | .9658981 .211085 -0.16 0.874 .6293784 1.48235

2015.5 | 1.313856 .2764393 1.30 0.195 .8698662 1.984464

2015.75 | .6584017 .1528933 -1.80 0.072 .4176629 1.037901

2016 | .9653403 .2224211 -0.15 0.878 .6145507 1.516363

|

\_cons | 7.99e-06 1.20e-06 -78.39 0.000 5.96e-06 .0000107

lnhours | 1 (offset)

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

(est1 stored)

**. lfit**

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

number of observations = 14794

number of covariate patterns = 14792

Pearson chi2(14467) = 39198.99

Prob > chi2 = 0.0000

**. linktest**

Iteration 0: log likelihood = -8395.7461

Iteration 1: log likelihood = -6204.3608

Iteration 2: log likelihood = -6100.5032

Iteration 3: log likelihood = -6090.2878

Iteration 4: log likelihood = -6090.1745

Iteration 5: log likelihood = -6090.1745

Logistic regression Number of obs = 14,794

LR chi2(2) = 4611.14

Prob > chi2 = 0.0000

Log likelihood = -6090.1745 Pseudo R2 = 0.2746

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

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

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

\_hat | 1.048282 .0263113 39.84 0.000 .9967132 1.099851

\_hatsq | .027236 .0101573 2.68 0.007 .0073281 .0471438

\_cons | -.0165657 .0286197 -0.58 0.563 -.0726593 .0395278

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

**. estat classification**

Logistic model for MR\_indicator

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

Classified | D ~D | Total

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

+ | 1704 677 | 2381

- | 2065 10348 | 12413

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

Total | 3769 11025 | 14794

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

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

Sensitivity Pr( +| D) 45.21%

Specificity Pr( -|~D) 93.86%

Positive predictive value Pr( D| +) 71.57%

Negative predictive value Pr(~D| -) 83.36%

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

False + rate for true ~D Pr( +|~D) 6.14%

False - rate for true D Pr( -| D) 54.79%

False + rate for classified + Pr(~D| +) 28.43%

False - rate for classified - Pr( D| -) 16.64%

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

Correctly classified 81.47%

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

**. summ MR\_indicator spbpp1\_yhat**

Variable | Obs Mean Std. Dev. Min Max

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

MR\_indicator | 30,289 .24187 .428223 0 1

spbpp1\_yhat | 28,208 .2112381 .2183407 7.40e-06 .9998194