. // Model SP.B.PP.3

**. eststo: logit MR\_indicator `subpart\_pp\_lag\_4\_vars' `covariates' ib(freq).state ib(freq).time if sample\_pp == 1, vce(cl mineid) offset(lnhours) iter(50) or**

note: sp48\_24\_pp\_c\_4lag != 0 predicts failure perfectly

sp48\_24\_pp\_c\_4lag dropped and 3 obs not used

note: sp75\_1401\_1\_pp\_c\_4lag != 0 predicts success perfectly

sp75\_1401\_1\_pp\_c\_4lag dropped and 4 obs not used

note: sp75\_1403\_11\_pp\_c\_4lag != 0 predicts success perfectly

sp75\_1403\_11\_pp\_c\_4lag dropped and 12 obs not used

note: sp75\_1403\_3\_pp\_c\_4lag != 0 predicts success perfectly

sp75\_1403\_3\_pp\_c\_4lag dropped and 6 obs not used

note: sp75\_1403\_4\_pp\_c\_4lag != 0 predicts success perfectly

sp75\_1403\_4\_pp\_c\_4lag dropped and 2 obs not used

note: sp75\_1727\_pp\_c\_4lag != 0 predicts failure perfectly

sp75\_1727\_pp\_c\_4lag dropped and 4 obs not used

note: sp75\_800\_2\_pp\_c\_4lag != 0 predicts failure perfectly

sp75\_800\_2\_pp\_c\_4lag dropped and 2 obs not used

note: sp75\_806\_pp\_c\_4lag != 0 predicts success perfectly

sp75\_806\_pp\_c\_4lag dropped and 1 obs not used

note: sp75\_834\_pp\_c\_4lag != 0 predicts failure perfectly

sp75\_834\_pp\_c\_4lag dropped and 3 obs not used

note: sp77\_1432\_pp\_c\_4lag != 0 predicts success perfectly

sp77\_1432\_pp\_c\_4lag dropped and 4 obs not used

note: sp77\_305\_pp\_c\_4lag != 0 predicts success perfectly

sp77\_305\_pp\_c\_4lag dropped and 4 obs not used

note: sp77\_403\_2\_pp\_c\_4lag != 0 predicts success perfectly

sp77\_403\_2\_pp\_c\_4lag dropped and 3 obs not used

note: sp77\_902\_2\_pp\_c\_4lag != 0 predicts failure perfectly

sp77\_902\_2\_pp\_c\_4lag dropped and 1 obs not used

note: sp75\_1001\_pp\_c\_4lag omitted because of collinearity

note: sp75\_1106\_6\_pp\_c\_4lag omitted because of collinearity

note: sp75\_1431\_pp\_c\_4lag omitted because of collinearity

note: sp75\_511\_1\_pp\_c\_4lag omitted because of collinearity

note: sp77\_413\_pp\_c\_4lag omitted because of collinearity

note: sp77\_606\_pp\_c\_4lag omitted because of collinearity

note: sp77\_804\_pp\_c\_4lag omitted because of collinearity

Iteration 0: log pseudolikelihood = -6017.1673

Iteration 1: log pseudolikelihood = -5565.583

Iteration 2: log pseudolikelihood = -5553.444

Iteration 3: log pseudolikelihood = -5553.1718

Iteration 4: log pseudolikelihood = -5553.1706

Iteration 5: log pseudolikelihood = -5553.1706

Logistic regression Number of obs = 12,954

Wald chi2(336) = .

Log pseudolikelihood = -5553.1706 Prob > chi2 = .

(Std. Err. adjusted for 807 clusters in mineid)

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| Robust

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

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

sp47\_41\_pp\_c\_4lag | .9981434 .0013504 -1.37 0.170 .9955002 1.000794

sp47\_42\_pp\_c\_4lag | .9966542 .0041154 -0.81 0.417 .9886208 1.004753

sp47\_44\_pp\_c\_4lag | 1.000651 .0027212 0.24 0.811 .9953315 1.005998

sp48\_11\_pp\_c\_4lag | 1.004114 .001434 2.87 0.004 1.001307 1.006928

sp48\_24\_pp\_c\_4lag | 1 (omitted)

sp48\_25\_pp\_c\_4lag | .9985666 .0022608 -0.63 0.526 .9941453 1.003008

sp48\_26\_pp\_c\_4lag | 1.00333 .0016285 2.05 0.041 1.000144 1.006527

sp48\_27\_pp\_c\_4lag | .9993595 .0015707 -0.41 0.684 .9962857 1.002443

sp48\_28\_pp\_c\_4lag | .9965285 .0026588 -1.30 0.192 .9913309 1.001753

sp48\_4\_pp\_c\_4lag | 1.011067 .0035606 3.13 0.002 1.004113 1.01807

sp48\_5\_pp\_c\_4lag | .9996044 .0027638 -0.14 0.886 .9942021 1.005036

sp48\_6\_pp\_c\_4lag | 1.000759 .0011783 0.64 0.520 .9984518 1.003071

sp48\_7\_pp\_c\_4lag | .9990865 .001272 -0.72 0.473 .9965966 1.001583

sp48\_8\_pp\_c\_4lag | 1.001288 .0025102 0.51 0.608 .9963802 1.00622

sp71\_701\_pp\_c\_4lag | 1.003604 .0089006 0.41 0.685 .9863103 1.021202

sp72\_503\_pp\_c\_4lag | .9963786 .0015756 -2.29 0.022 .9932952 .9994717

sp72\_610\_pp\_c\_4lag | 1.009773 .0082692 1.19 0.235 .9936946 1.026111

sp72\_620\_pp\_c\_4lag | 1.002922 .0059914 0.49 0.625 .9912479 1.014734

sp72\_630\_pp\_c\_4lag | 1.000061 .0001771 0.34 0.732 .9997135 1.000408

sp75\_100\_pp\_c\_4lag | 1.000802 .0039576 0.20 0.839 .9930755 1.008589

sp75\_1001\_1\_pp\_c\_4lag | 1.000021 .0036919 0.01 0.996 .9928108 1.007283

sp75\_1001\_pp\_c\_4lag | 1 (omitted)

sp75\_1003\_1\_pp\_c\_4lag | .9979762 .0078099 -0.26 0.796 .9827859 1.013401

sp75\_1100\_2\_pp\_c\_4lag | 1.000346 .0001967 1.76 0.079 .9999605 1.000732

sp75\_1101\_20\_pp\_c\_4lag | .9873204 .0031072 -4.05 0.000 .9812492 .9934292

sp75\_1102\_pp\_c\_4lag | .9986182 .0012491 -1.11 0.269 .996173 1.001069

sp75\_1103\_4\_pp\_c\_4lag | 1.000245 .0003134 0.78 0.434 .999631 1.00086

sp75\_1104\_pp\_c\_4lag | .9979637 .001187 -1.71 0.087 .9956399 1.000293

sp75\_1106\_2\_pp\_c\_4lag | .9993643 .0010929 -0.58 0.561 .9972246 1.001509

sp75\_1106\_3\_pp\_c\_4lag | 1.000301 .0004309 0.70 0.484 .9994573 1.001146

sp75\_1106\_4\_pp\_c\_4lag | .9985287 .0031218 -0.47 0.638 .9924287 1.004666

sp75\_1106\_5\_pp\_c\_4lag | .9989538 .0012206 -0.86 0.392 .9965643 1.001349

sp75\_1106\_6\_pp\_c\_4lag | 1 (omitted)

sp75\_1106\_pp\_c\_4lag | 1.007289 .0035949 2.03 0.042 1.000267 1.014359

sp75\_1107\_14\_pp\_c\_4lag | .9992205 .0084204 -0.09 0.926 .9828523 1.015861

sp75\_1400\_1\_pp\_c\_4lag | 1.003497 .0045715 0.77 0.444 .9945767 1.012497

sp75\_1400\_2\_pp\_c\_4lag | .9967511 .0048516 -0.67 0.504 .9872873 1.006306

sp75\_1400\_3\_pp\_c\_4lag | 1.00275 .0013446 2.05 0.041 1.000118 1.005388

sp75\_1400\_4\_pp\_c\_4lag | .9917468 .0034748 -2.37 0.018 .9849597 .9985807

sp75\_1400\_pp\_c\_4lag | .9987056 .0017056 -0.76 0.448 .9953683 1.002054

sp75\_1401\_1\_pp\_c\_4lag | 1 (omitted)

sp75\_1401\_pp\_c\_4lag | .9966886 .0041698 -0.79 0.428 .9885494 1.004895

sp75\_1403\_10\_pp\_c\_4lag | 1.000732 .0007413 0.99 0.323 .9992805 1.002186

sp75\_1403\_11\_pp\_c\_4lag | 1 (omitted)

sp75\_1403\_3\_pp\_c\_4lag | 1 (omitted)

sp75\_1403\_4\_pp\_c\_4lag | 1 (omitted)

sp75\_1403\_5\_pp\_c\_4lag | .9999566 .0004444 -0.10 0.922 .999086 1.000828

sp75\_1403\_6\_pp\_c\_4lag | .9995868 .0002833 -1.46 0.145 .9990318 1.000142

sp75\_1403\_7\_pp\_c\_4lag | .997937 .0013843 -1.49 0.137 .9952275 1.000654

sp75\_1403\_8\_pp\_c\_4lag | .999427 .0004274 -1.34 0.180 .9985897 1.000265

sp75\_1403\_9\_pp\_c\_4lag | .9975379 .0017798 -1.38 0.167 .9940557 1.001032

sp75\_1404\_1\_pp\_c\_4lag | .9642571 .0118598 -2.96 0.003 .9412904 .9877843

sp75\_1404\_pp\_c\_4lag | 1.000374 .0080713 0.05 0.963 .9846791 1.016319

sp75\_1405\_1\_pp\_c\_4lag | 1.012351 .003377 3.68 0.000 1.005754 1.018991

sp75\_1405\_pp\_c\_4lag | 1.000149 .0004939 0.30 0.763 .9991812 1.001117

sp75\_1431\_pp\_c\_4lag | 1 (omitted)

sp75\_1432\_pp\_c\_4lag | 1.003514 .0026812 1.31 0.189 .9982727 1.008783

sp75\_1433\_pp\_c\_4lag | .9989005 .0028337 -0.39 0.698 .993362 1.00447

sp75\_1434\_pp\_c\_4lag | .99533 .002586 -1.80 0.072 .9902745 1.000411

sp75\_1435\_pp\_c\_4lag | .9901992 .0067616 -1.44 0.149 .9770351 1.003541

sp75\_1437\_pp\_c\_4lag | 1.002857 .0060019 0.48 0.634 .9911626 1.01469

sp75\_150\_pp\_c\_4lag | 1.012834 .0047975 2.69 0.007 1.003474 1.02228

sp75\_151\_pp\_c\_4lag | .9933987 .0081713 -0.81 0.421 .9775117 1.009544

sp75\_153\_pp\_c\_4lag | 1.007616 .0051154 1.49 0.135 .9976392 1.017692

sp75\_156\_pp\_c\_4lag | 1.010561 .0047648 2.23 0.026 1.001265 1.019943

sp75\_160\_pp\_c\_4lag | .9957068 .0076601 -0.56 0.576 .9808059 1.010834

sp75\_1600\_2\_pp\_c\_4lag | .9993648 .0006645 -0.96 0.339 .9980632 1.000668

sp75\_1712\_10\_pp\_c\_4lag | .9965483 .0025086 -1.37 0.170 .9916436 1.001477

sp75\_1712\_6\_pp\_c\_4lag | 1.000577 .0013095 0.44 0.659 .9980136 1.003147

sp75\_1720\_pp\_c\_4lag | .9997158 .0008004 -0.36 0.723 .9981482 1.001286

sp75\_1721\_pp\_c\_4lag | 1.009536 .0047391 2.02 0.043 1.00029 1.018867

sp75\_1725\_pp\_c\_4lag | 1.000153 .0001174 1.31 0.191 .9999233 1.000384

sp75\_1726\_pp\_c\_4lag | 1.006367 .0028541 2.24 0.025 1.000789 1.011976

sp75\_1727\_pp\_c\_4lag | 1 (omitted)

sp75\_1728\_pp\_c\_4lag | 1.0067 .0056293 1.19 0.232 .9957266 1.017794

sp75\_1729\_pp\_c\_4lag | .9998518 .0029136 -0.05 0.959 .9941575 1.005579

sp75\_1730\_pp\_c\_4lag | 1.003208 .0027819 1.16 0.248 .9977705 1.008676

sp75\_1731\_pp\_c\_4lag | .9999191 .0000755 -1.07 0.284 .9997712 1.000067

sp75\_1903\_pp\_c\_4lag | 1.003611 .0017102 2.12 0.034 1.000265 1.006969

sp75\_1909\_pp\_c\_4lag | .9999432 .0002026 -0.28 0.779 .9995461 1.00034

sp75\_1910\_pp\_c\_4lag | 1.000427 .0003191 1.34 0.181 .9998016 1.001052

sp75\_1911\_pp\_c\_4lag | 1.000045 .0004028 0.11 0.911 .9992559 1.000835

sp75\_1912\_pp\_c\_4lag | 1.000398 .002296 0.17 0.862 .9959081 1.004908

sp75\_1913\_pp\_c\_4lag | .9974746 .0033201 -0.76 0.447 .9909886 1.004003

sp75\_1914\_pp\_c\_4lag | 1.00025 .0002215 1.13 0.258 .9998163 1.000685

sp75\_1915\_pp\_c\_4lag | 1.00253 .0025496 0.99 0.320 .9975457 1.00754

sp75\_202\_pp\_c\_4lag | 1.000031 .0000582 0.54 0.592 .9999171 1.000145

sp75\_208\_pp\_c\_4lag | .9999325 .0004729 -0.14 0.887 .999006 1.00086

sp75\_211\_pp\_c\_4lag | .9999776 .0003431 -0.07 0.948 .9993053 1.00065

sp75\_212\_pp\_c\_4lag | .997268 .0009249 -2.95 0.003 .9954569 .9990824

sp75\_214\_pp\_c\_4lag | 1.001369 .0007654 1.79 0.073 .9998704 1.00287

sp75\_312\_pp\_c\_4lag | .999486 .0007087 -0.73 0.468 .998098 1.000876

sp75\_320\_pp\_c\_4lag | .9994318 .0004422 -1.28 0.199 .9985656 1.000299

sp75\_324\_pp\_c\_4lag | .9994919 .0015257 -0.33 0.739 .996506 1.002487

sp75\_337\_pp\_c\_4lag | 1.000055 .000689 0.08 0.937 .9987053 1.001406

sp75\_340\_pp\_c\_4lag | 1.000283 .000367 0.77 0.441 .9995639 1.001003

sp75\_341\_pp\_c\_4lag | .988162 .0176434 -0.67 0.505 .9541796 1.023355

sp75\_342\_pp\_c\_4lag | .9999955 .0001671 -0.03 0.979 .9996681 1.000323

sp75\_344\_pp\_c\_4lag | .995055 .0034822 -1.42 0.157 .9882535 1.001903

sp75\_352\_pp\_c\_4lag | .998778 .0016423 -0.74 0.457 .9955644 1.002002

sp75\_382\_pp\_c\_4lag | .999371 .0016948 -0.37 0.711 .9960549 1.002698

sp75\_503\_pp\_c\_4lag | 1.000043 .0000869 0.49 0.621 .9998727 1.000213

sp75\_504\_pp\_c\_4lag | 1.000375 .0018431 0.20 0.839 .9967691 1.003994

sp75\_505\_pp\_c\_4lag | 1.003366 .0029913 1.13 0.260 .9975199 1.009246

sp75\_506\_1\_pp\_c\_4lag | 1.007013 .0024903 2.83 0.005 1.002144 1.011905

sp75\_506\_pp\_c\_4lag | .9987034 .001795 -0.72 0.470 .9951916 1.002228

sp75\_507\_pp\_c\_4lag | .9985489 .0009711 -1.49 0.135 .9966474 1.000454

sp75\_511\_1\_pp\_c\_4lag | 1 (omitted)

sp75\_511\_pp\_c\_4lag | 1.000004 .0011804 0.00 0.997 .9976931 1.00232

sp75\_512\_1\_pp\_c\_4lag | .9857928 .0083811 -1.68 0.092 .9695023 1.002357

sp75\_512\_2\_pp\_c\_4lag | 1.000436 .0003729 1.17 0.242 .9997058 1.001167

sp75\_512\_pp\_c\_4lag | .9999379 .0001139 -0.54 0.586 .9997147 1.000161

sp75\_513\_1\_pp\_c\_4lag | 1.00166 .0037276 0.45 0.656 .9943804 1.008993

sp75\_513\_pp\_c\_4lag | .9981654 .0013869 -1.32 0.186 .9954508 1.000887

sp75\_514\_pp\_c\_4lag | .9999244 .0004054 -0.19 0.852 .99913 1.000719

sp75\_515\_pp\_c\_4lag | .999155 .0002814 -3.00 0.003 .9986036 .9997066

sp75\_516\_1\_pp\_c\_4lag | .9930904 .0056468 -1.22 0.223 .9820843 1.00422

sp75\_516\_2\_pp\_c\_4lag | 1.001052 .0007693 1.37 0.171 .9995457 1.002561

sp75\_516\_pp\_c\_4lag | .9998846 .0003984 -0.29 0.772 .9991042 1.000666

sp75\_517\_1\_pp\_c\_4lag | 1.00756 .0036385 2.09 0.037 1.000454 1.014716

sp75\_517\_pp\_c\_4lag | .9999863 .0000862 -0.16 0.874 .9998174 1.000155

sp75\_518\_1\_pp\_c\_4lag | .9999227 .0005061 -0.15 0.879 .9989313 1.000915

sp75\_518\_pp\_c\_4lag | 1.000172 .0003979 0.43 0.665 .9993927 1.000952

sp75\_519\_pp\_c\_4lag | 1.011554 .0094865 1.22 0.221 .9931307 1.030319

sp75\_520\_pp\_c\_4lag | 1.001186 .0009262 1.28 0.200 .999372 1.003003

sp75\_523\_1\_pp\_c\_4lag | .9977465 .0008539 -2.64 0.008 .9960742 .9994215

sp75\_523\_2\_pp\_c\_4lag | .9999909 .000763 -0.01 0.990 .9984966 1.001487

sp75\_523\_pp\_c\_4lag | .9993233 .0010135 -0.67 0.504 .9973388 1.001312

sp75\_600\_1\_pp\_c\_4lag | .9922179 .0038252 -2.03 0.043 .9847488 .9997436

sp75\_600\_pp\_c\_4lag | 1.003233 .0112565 0.29 0.774 .9814113 1.02554

sp75\_601\_1\_pp\_c\_4lag | .9999304 .0003587 -0.19 0.846 .9992276 1.000634

sp75\_601\_2\_pp\_c\_4lag | .9927354 .0049237 -1.47 0.142 .9831319 1.002433

sp75\_601\_3\_pp\_c\_4lag | 1.006665 .0069213 0.97 0.334 .9931904 1.020322

sp75\_601\_pp\_c\_4lag | .999809 .0004529 -0.42 0.673 .9989218 1.000697

sp75\_602\_pp\_c\_4lag | 1.000657 .0012695 0.52 0.605 .9981721 1.003149

sp75\_603\_pp\_c\_4lag | 1.000893 .0017003 0.53 0.599 .9975656 1.004231

sp75\_604\_pp\_c\_4lag | 1.000252 .0001487 1.70 0.090 .999961 1.000544

sp75\_605\_pp\_c\_4lag | 1.00059 .0005154 1.15 0.252 .9995805 1.001601

sp75\_606\_pp\_c\_4lag | 1.000159 .0002339 0.68 0.496 .9997008 1.000617

sp75\_607\_pp\_c\_4lag | 1.001454 .0011596 1.25 0.210 .9991836 1.003729

sp75\_700\_1\_pp\_c\_4lag | 1.001137 .0041179 0.28 0.782 .9930987 1.009241

sp75\_700\_pp\_c\_4lag | .9989393 .0014905 -0.71 0.477 .9960222 1.001865

sp75\_701\_1\_pp\_c\_4lag | 1.000261 .001797 0.15 0.884 .9967452 1.003789

sp75\_701\_2\_pp\_c\_4lag | 1.001418 .0018835 0.75 0.451 .9977328 1.005116

sp75\_701\_3\_pp\_c\_4lag | 1.001139 .0025477 0.45 0.655 .9961578 1.006145

sp75\_701\_4\_pp\_c\_4lag | 1.00487 .0035714 1.37 0.172 .9978947 1.011895

sp75\_701\_pp\_c\_4lag | 1.000785 .0003411 2.30 0.021 1.000117 1.001454

sp75\_702\_1\_pp\_c\_4lag | .994542 .0070913 -0.77 0.443 .98074 1.008538

sp75\_702\_pp\_c\_4lag | 1.005264 .0028121 1.88 0.061 .9997675 1.010791

sp75\_703\_1\_pp\_c\_4lag | 1.015846 .0139481 1.15 0.252 .9888729 1.043555

sp75\_703\_2\_pp\_c\_4lag | 1.012611 .0117556 1.08 0.280 .9898309 1.035916

sp75\_703\_3\_pp\_c\_4lag | .9982302 .001954 -0.90 0.366 .9944077 1.002067

sp75\_703\_4\_pp\_c\_4lag | 1.01802 .0069881 2.60 0.009 1.004415 1.031809

sp75\_703\_pp\_c\_4lag | 1.002395 .0007943 3.02 0.003 1.000839 1.003953

sp75\_704\_pp\_c\_4lag | 1.004457 .0028841 1.55 0.121 .9988206 1.010126

sp75\_705\_1\_pp\_c\_4lag | .9972485 .0029554 -0.93 0.353 .9914729 1.003058

sp75\_705\_3\_pp\_c\_4lag | 1.051724 .0088932 5.96 0.000 1.034437 1.069299

sp75\_705\_8\_pp\_c\_4lag | .9960535 .0109056 -0.36 0.718 .9749066 1.017659

sp75\_705\_pp\_c\_4lag | 1.013758 .0029307 4.73 0.000 1.00803 1.019518

sp75\_706\_pp\_c\_4lag | 1.000561 .0020624 0.27 0.786 .9965268 1.004611

sp75\_800\_2\_pp\_c\_4lag | 1 (omitted)

sp75\_800\_3\_pp\_c\_4lag | .9996965 .0028181 -0.11 0.914 .9941884 1.005235

sp75\_800\_4\_pp\_c\_4lag | 1.000174 .0022627 0.08 0.939 .9957492 1.004619

sp75\_800\_pp\_c\_4lag | .9981513 .0022074 -0.84 0.403 .9938343 1.002487

sp75\_801\_pp\_c\_4lag | .9962287 .0054623 -0.69 0.491 .9855801 1.006992

sp75\_802\_pp\_c\_4lag | .996418 .0034776 -1.03 0.304 .9896253 1.003257

sp75\_803\_2\_pp\_c\_4lag | 1.008902 .0049894 1.79 0.073 .9991705 1.018729

sp75\_803\_pp\_c\_4lag | 1.001823 .0017783 1.03 0.305 .9983432 1.005314

sp75\_804\_pp\_c\_4lag | .9995232 .0024305 -0.20 0.845 .994771 1.004298

sp75\_805\_pp\_c\_4lag | 1.006095 .0033513 1.82 0.068 .9995481 1.012685

sp75\_806\_pp\_c\_4lag | 1 (omitted)

sp75\_807\_pp\_c\_4lag | 1.000365 .0002713 1.35 0.178 .9998335 1.000897

sp75\_808\_pp\_c\_4lag | .9998573 .0022297 -0.06 0.949 .9954966 1.004237

sp75\_809\_pp\_c\_4lag | 1.000476 .0009616 0.49 0.621 .9985929 1.002362

sp75\_810\_pp\_c\_4lag | .9995792 .0010416 -0.40 0.686 .9975397 1.001623

sp75\_811\_pp\_c\_4lag | 1.001394 .0009457 1.47 0.140 .9995419 1.003249

sp75\_812\_pp\_c\_4lag | .9914648 .0033321 -2.55 0.011 .9849554 .9980172

sp75\_814\_pp\_c\_4lag | 1.004086 .0043274 0.95 0.344 .9956401 1.012603

sp75\_815\_pp\_c\_4lag | 1.004837 .0021221 2.28 0.022 1.000686 1.009004

sp75\_816\_pp\_c\_4lag | 1.000921 .000727 1.27 0.205 .9994971 1.002347

sp75\_818\_pp\_c\_4lag | 1.002094 .00572 0.37 0.714 .9909454 1.013368

sp75\_820\_pp\_c\_4lag | 1.001854 .0034491 0.54 0.591 .9951164 1.008637

sp75\_821\_pp\_c\_4lag | 1.00021 .0011718 0.18 0.858 .9979161 1.00251

sp75\_825\_pp\_c\_4lag | .9990698 .0030298 -0.31 0.759 .9931491 1.005026

sp75\_827\_pp\_c\_4lag | 1.004737 .0046004 1.03 0.302 .9957612 1.013795

sp75\_831\_pp\_c\_4lag | .9946064 .0038599 -1.39 0.163 .9870699 1.0022

sp75\_832\_pp\_c\_4lag | .9857734 .0164229 -0.86 0.390 .9541049 1.018493

sp75\_834\_pp\_c\_4lag | 1 (omitted)

sp75\_900\_2\_pp\_c\_4lag | .9930606 .0052981 -1.31 0.192 .9827306 1.003499

sp75\_900\_3\_pp\_c\_4lag | .999666 .0015735 -0.21 0.832 .9965869 1.002755

sp75\_900\_4\_pp\_c\_4lag | 1.000268 .0012192 0.22 0.826 .997881 1.00266

sp75\_900\_pp\_c\_4lag | .9995591 .000563 -0.78 0.434 .9984563 1.000663

sp75\_901\_pp\_c\_4lag | .9983776 .0023369 -0.69 0.488 .9938079 1.002968

sp75\_902\_1\_pp\_c\_4lag | .9989367 .0072898 -0.15 0.884 .9847507 1.013327

sp75\_902\_2\_pp\_c\_4lag | .9996435 .0014664 -0.24 0.808 .9967736 1.002522

sp75\_902\_4\_pp\_c\_4lag | 1.000857 .0012289 0.70 0.485 .9984514 1.003269

sp75\_902\_pp\_c\_4lag | 1.000443 .000553 0.80 0.423 .9993596 1.001527

sp75\_903\_pp\_c\_4lag | 1.000431 .0008591 0.50 0.616 .9987485 1.002116

sp75\_904\_pp\_c\_4lag | .9999377 .0002883 -0.22 0.829 .9993729 1.000503

sp75\_905\_pp\_c\_4lag | 1.00326 .0044088 0.74 0.459 .9946561 1.011939

sp75\_907\_pp\_c\_4lag | .9993012 .0016566 -0.42 0.673 .9960597 1.002553

sp77\_103\_pp\_c\_4lag | 1.001387 .0027834 0.50 0.618 .995947 1.006858

sp77\_104\_pp\_c\_4lag | 1.019414 .0178463 1.10 0.272 .9850291 1.054999

sp77\_1103\_pp\_c\_4lag | .9998335 .0007309 -0.23 0.820 .9984021 1.001267

sp77\_1104\_pp\_c\_4lag | .999975 .0002502 -0.10 0.921 .9994848 1.000466

sp77\_1106\_pp\_c\_4lag | 1.000589 .0102223 0.06 0.954 .9807531 1.020826

sp77\_1111\_pp\_c\_4lag | .9895637 .0107968 -0.96 0.336 .968627 1.010953

sp77\_1112\_pp\_c\_4lag | 1.002191 .0022806 0.96 0.336 .9977314 1.006671

sp77\_1403\_pp\_c\_4lag | 1.003037 .0021535 1.41 0.158 .9988247 1.007266

sp77\_1432\_pp\_c\_4lag | 1 (omitted)

sp77\_1433\_pp\_c\_4lag | 1.000349 .0039023 0.09 0.929 .99273 1.008027

sp77\_1434\_pp\_c\_4lag | 1.000803 .007367 0.11 0.913 .9864672 1.015346

sp77\_1437\_pp\_c\_4lag | 1.003226 .0062552 0.52 0.606 .9910402 1.015561

sp77\_1438\_pp\_c\_4lag | .9963735 .0163014 -0.22 0.824 .9649302 1.028842

sp77\_1605\_pp\_c\_4lag | .9999265 .0003048 -0.24 0.809 .9993292 1.000524

sp77\_1606\_pp\_c\_4lag | 1.000548 .0004339 1.26 0.206 .9996983 1.001399

sp77\_1710\_pp\_c\_4lag | 1.000185 .0008149 0.23 0.820 .9985892 1.001784

sp77\_1802\_pp\_c\_4lag | .9897687 .0132663 -0.77 0.443 .9641058 1.016115

sp77\_1906\_pp\_c\_4lag | .9956241 .0054991 -0.79 0.427 .9849041 1.006461

sp77\_1915\_pp\_c\_4lag | .9982088 .003323 -0.54 0.590 .9917171 1.004743

sp77\_1916\_pp\_c\_4lag | 1.003605 .0093768 0.39 0.700 .9853943 1.022153

sp77\_200\_pp\_c\_4lag | 1.001879 .0007388 2.55 0.011 1.000432 1.003328

sp77\_202\_pp\_c\_4lag | .9988377 .0005719 -2.03 0.042 .9977173 .9999593

sp77\_203\_pp\_c\_4lag | 1.005754 .0038959 1.48 0.139 .9981474 1.013419

sp77\_204\_pp\_c\_4lag | 1.000073 .001127 0.07 0.948 .997867 1.002285

sp77\_205\_pp\_c\_4lag | 1.000691 .0003343 2.07 0.039 1.000036 1.001346

sp77\_206\_pp\_c\_4lag | 1.001332 .0013602 0.98 0.327 .9986699 1.004002

sp77\_207\_pp\_c\_4lag | 1.001206 .0009649 1.25 0.211 .999317 1.003099

sp77\_208\_pp\_c\_4lag | 1.000704 .0004843 1.45 0.146 .9997549 1.001653

sp77\_210\_pp\_c\_4lag | .9986022 .0018324 -0.76 0.446 .9950173 1.0022

sp77\_216\_pp\_c\_4lag | 1.000629 .0019033 0.33 0.741 .9969057 1.004367

sp77\_305\_pp\_c\_4lag | 1 (omitted)

sp77\_309\_pp\_c\_4lag | 1.015113 .0082119 1.85 0.064 .9991451 1.031337

sp77\_314\_pp\_c\_4lag | .9947718 .0204701 -0.25 0.799 .9554495 1.035713

sp77\_315\_pp\_c\_4lag | .9808074 .013218 -1.44 0.150 .9552397 1.007059

sp77\_400\_pp\_c\_4lag | .9998127 .000377 -0.50 0.619 .9990741 1.000552

sp77\_401\_pp\_c\_4lag | .9985838 .001935 -0.73 0.465 .9947984 1.002384

sp77\_402\_pp\_c\_4lag | .9971891 .0012916 -2.17 0.030 .9946607 .9997238

sp77\_403\_1\_pp\_c\_4lag | 1.000496 .0023494 0.21 0.833 .9959022 1.005112

sp77\_403\_2\_pp\_c\_4lag | 1 (omitted)

sp77\_403\_pp\_c\_4lag | 1.008256 .0061728 1.34 0.179 .9962299 1.020427

sp77\_404\_pp\_c\_4lag | .999988 .0002134 -0.06 0.955 .9995699 1.000406

sp77\_405\_pp\_c\_4lag | 1.002248 .0027709 0.81 0.417 .9968313 1.007693

sp77\_408\_pp\_c\_4lag | 1.00611 .0026612 2.30 0.021 1.000907 1.011339

sp77\_409\_pp\_c\_4lag | .9842627 .0098032 -1.59 0.111 .9652351 1.003665

sp77\_410\_pp\_c\_4lag | 1.00044 .0005044 0.87 0.383 .9994516 1.001429

sp77\_411\_pp\_c\_4lag | .9797579 .0065008 -3.08 0.002 .967099 .9925825

sp77\_412\_pp\_c\_4lag | 1.005416 .0028663 1.89 0.058 .9998141 1.01105

sp77\_413\_pp\_c\_4lag | 1 (omitted)

sp77\_500\_pp\_c\_4lag | 1.006903 .0058741 1.18 0.238 .9954555 1.018482

sp77\_501\_pp\_c\_4lag | 1.000712 .0038842 0.18 0.855 .9931278 1.008354

sp77\_502\_1\_pp\_c\_4lag | 1.03572 .0065862 5.52 0.000 1.022892 1.04871

sp77\_502\_2\_pp\_c\_4lag | 1.000551 .0019449 0.28 0.777 .9967466 1.00437

sp77\_502\_pp\_c\_4lag | .9998913 .0002978 -0.37 0.715 .9993078 1.000475

sp77\_503\_1\_pp\_c\_4lag | 1.00106 .0072017 0.15 0.883 .9870435 1.015275

sp77\_503\_pp\_c\_4lag | .9992356 .0034497 -0.22 0.825 .9924972 1.00602

sp77\_504\_pp\_c\_4lag | .9991214 .0011895 -0.74 0.460 .9967928 1.001455

sp77\_505\_pp\_c\_4lag | .9997788 .0006424 -0.34 0.731 .9985205 1.001039

sp77\_506\_1\_pp\_c\_4lag | 1.00138 .000935 1.48 0.140 .9995494 1.003215

sp77\_506\_pp\_c\_4lag | .9980749 .0008244 -2.33 0.020 .9964604 .999692

sp77\_507\_pp\_c\_4lag | .9970724 .0038163 -0.77 0.444 .9896205 1.00458

sp77\_508\_1\_pp\_c\_4lag | .9952648 .005823 -0.81 0.417 .9839171 1.006743

sp77\_508\_pp\_c\_4lag | 1.002555 .0026241 0.97 0.330 .9974251 1.007711

sp77\_509\_pp\_c\_4lag | .9998056 .0014913 -0.13 0.896 .9968869 1.002733

sp77\_510\_pp\_c\_4lag | 1.04439 .0187951 2.41 0.016 1.008194 1.081885

sp77\_511\_pp\_c\_4lag | .9864919 .0043687 -3.07 0.002 .9779665 .9950917

sp77\_512\_pp\_c\_4lag | 1.000103 .0006734 0.15 0.879 .998784 1.001423

sp77\_513\_pp\_c\_4lag | .9992407 .0008832 -0.86 0.390 .9975111 1.000973

sp77\_514\_pp\_c\_4lag | .977173 .0119549 -1.89 0.059 .9540205 1.000887

sp77\_515\_pp\_c\_4lag | .9980632 .0083045 -0.23 0.816 .9819187 1.014473

sp77\_516\_pp\_c\_4lag | .9998168 .0003687 -0.50 0.619 .9990944 1.00054

sp77\_600\_pp\_c\_4lag | 1.006149 .0028526 2.16 0.031 1.000573 1.011755

sp77\_601\_pp\_c\_4lag | .9952436 .0050879 -0.93 0.351 .9853213 1.005266

sp77\_602\_pp\_c\_4lag | .9989608 .0055264 -0.19 0.851 .9881877 1.009851

sp77\_603\_pp\_c\_4lag | 1.004582 .0043499 1.06 0.291 .9960919 1.013143

sp77\_604\_pp\_c\_4lag | 1.00071 .0029486 0.24 0.810 .9949473 1.006506

sp77\_605\_pp\_c\_4lag | .9901419 .0086841 -1.13 0.259 .9732668 1.00731

sp77\_606\_1\_pp\_c\_4lag | .9858763 .0090575 -1.55 0.122 .9682828 1.003789

sp77\_606\_pp\_c\_4lag | 1 (omitted)

sp77\_700\_1\_pp\_c\_4lag | 1.009654 .0050366 1.93 0.054 .9998302 1.019574

sp77\_700\_pp\_c\_4lag | .9983911 .0033489 -0.48 0.631 .991849 1.004976

sp77\_701\_1\_pp\_c\_4lag | 1.004259 .0038281 1.11 0.265 .9967839 1.01179

sp77\_701\_2\_pp\_c\_4lag | .9984781 .0021579 -0.70 0.481 .9942576 1.002716

sp77\_701\_3\_pp\_c\_4lag | 1.007913 .0081297 0.98 0.328 .9921042 1.023973

sp77\_701\_4\_pp\_c\_4lag | 1.005128 .0040957 1.26 0.209 .9971321 1.013187

sp77\_701\_pp\_c\_4lag | .9997134 .0009467 -0.30 0.762 .9978597 1.001571

sp77\_703\_pp\_c\_4lag | .9993731 .0170096 -0.04 0.971 .966585 1.033274

sp77\_704\_1\_pp\_c\_4lag | .9999582 .0018855 -0.02 0.982 .9962695 1.003661

sp77\_704\_8\_pp\_c\_4lag | .9988109 .0063488 -0.19 0.852 .9864448 1.011332

sp77\_704\_9\_pp\_c\_4lag | .9818065 .0108202 -1.67 0.096 .9608267 1.003244

sp77\_704\_pp\_c\_4lag | .9879659 .0078909 -1.52 0.130 .9726205 1.003553

sp77\_705\_pp\_c\_4lag | 1.002036 .0018409 1.11 0.268 .9984345 1.005651

sp77\_800\_1\_pp\_c\_4lag | .9994538 .0045961 -0.12 0.905 .9904861 1.008503

sp77\_800\_2\_pp\_c\_4lag | 1.000815 .0035762 0.23 0.820 .9938307 1.007849

sp77\_800\_pp\_c\_4lag | .9970617 .0068688 -0.43 0.669 .9836895 1.010616

sp77\_801\_pp\_c\_4lag | .9793419 .0164889 -1.24 0.215 .9475517 1.012199

sp77\_802\_pp\_c\_4lag | .9878167 .0051662 -2.34 0.019 .9777429 .9979943

sp77\_803\_pp\_c\_4lag | 1.003919 .0071164 0.55 0.581 .9900677 1.017964

sp77\_804\_pp\_c\_4lag | 1 (omitted)

sp77\_805\_pp\_c\_4lag | 1.001725 .0087298 0.20 0.843 .98476 1.018982

sp77\_807\_1\_pp\_c\_4lag | .9999905 .007379 -0.00 0.999 .985632 1.014558

sp77\_807\_2\_pp\_c\_4lag | 1.004051 .0048391 0.84 0.402 .994611 1.01358

sp77\_807\_3\_pp\_c\_4lag | 1.012697 .0043411 2.94 0.003 1.004224 1.021241

sp77\_807\_pp\_c\_4lag | 1.005117 .0028578 1.80 0.073 .9995316 1.010734

sp77\_808\_pp\_c\_4lag | 1.005285 .00606 0.87 0.382 .9934776 1.017233

sp77\_809\_pp\_c\_4lag | .999716 .00178 -0.16 0.873 .9962334 1.003211

sp77\_810\_pp\_c\_4lag | .9950225 .0036347 -1.37 0.172 .9879241 1.002172

sp77\_900\_1\_pp\_c\_4lag | 1.01045 .0051541 2.04 0.042 1.000399 1.020603

sp77\_900\_2\_pp\_c\_4lag | 1.002737 .0025981 1.05 0.291 .997658 1.007842

sp77\_900\_pp\_c\_4lag | .9948867 .0026756 -1.91 0.057 .9896563 1.000145

sp77\_901\_1\_pp\_c\_4lag | .9945415 .0115487 -0.47 0.637 .9721622 1.017436

sp77\_901\_pp\_c\_4lag | .9983586 .0033354 -0.49 0.623 .9918427 1.004917

sp77\_902\_2\_pp\_c\_4lag | 1 (omitted)

sp77\_902\_3\_pp\_c\_4lag | .9954649 .0057553 -0.79 0.432 .9842483 1.006809

sp77\_902\_pp\_c\_4lag | .9999633 .003931 -0.01 0.993 .9922884 1.007698

sp77\_903\_pp\_c\_4lag | .999608 .0036396 -0.11 0.914 .9925 1.006767

sp77\_904\_pp\_c\_4lag | .9981535 .0009002 -2.05 0.040 .9963907 .9999196

mine\_time | .996871 .0026165 -1.19 0.232 .9917559 1.002013

onsite\_insp\_hours | 1.000712 .0002872 2.48 0.013 1.000149 1.001275

|

state |

AL | 2.310213 .7575337 2.55 0.011 1.214892 4.393053

AR | 2.517251 .4242761 5.48 0.000 1.809084 3.502631

CO | .855181 .2515562 -0.53 0.595 .4804767 1.522102

IL | 1.112217 .1972163 0.60 0.549 .7856986 1.574429

IN | .7559002 .1994683 -1.06 0.289 .4506588 1.267888

KY | .9275716 .0852064 -0.82 0.413 .7747407 1.110551

MD | 1.250741 .3451031 0.81 0.417 .7282909 2.147979

MT | .4427028 .1205889 -2.99 0.003 .2595681 .7550457

NM | 1.628591 .3674472 2.16 0.031 1.046554 2.534326

OH | .757696 .2214887 -0.95 0.343 .427241 1.343746

OK | .6510257 .4163248 -0.67 0.502 .1858929 2.279993

PA | 1.013721 .1620107 0.09 0.932 .7411078 1.386614

TN | 1.312331 .229668 1.55 0.120 .9312726 1.849312

UT | .6641691 .2061027 -1.32 0.187 .3615236 1.220171

VA | .6586669 .0759676 -3.62 0.000 .5254025 .8257328

WY | 2.893684 1.126351 2.73 0.006 1.349352 6.205502

|

time |

2007 | 1.69751 .3373348 2.66 0.008 1.149897 2.505913

2007.25 | 1.504494 .3009616 2.04 0.041 1.016517 2.226724

2007.5 | 1.711165 .3429453 2.68 0.007 1.155307 2.534466

2007.75 | 1.59668 .3104986 2.41 0.016 1.090659 2.337475

2008 | 1.029343 .1998652 0.15 0.882 .7035324 1.506038

2008.25 | 1.251372 .2641064 1.06 0.288 .8274415 1.892498

2008.5 | 1.330267 .2583862 1.47 0.142 .9090852 1.946584

2009 | .8842437 .1727769 -0.63 0.529 .6029083 1.296859

2009.25 | .8297962 .1725011 -0.90 0.369 .5521034 1.247161

2009.5 | 1.100613 .222778 0.47 0.636 .740186 1.636548

2009.75 | .847777 .1834507 -0.76 0.445 .5547406 1.295607

2010 | .9289604 .1892563 -0.36 0.718 .6231357 1.384879

2010.25 | 1.045768 .2185914 0.21 0.830 .6942453 1.575279

2010.5 | 1.286426 .2732048 1.19 0.236 .8484203 1.950558

2010.75 | .8742138 .1803984 -0.65 0.515 .583402 1.309988

2011 | 1.114285 .223617 0.54 0.590 .7519265 1.651266

2011.25 | 1.157504 .2310175 0.73 0.464 .7827761 1.71162

2011.5 | 1.362743 .2757356 1.53 0.126 .9166062 2.026025

2011.75 | .8285417 .1696801 -0.92 0.358 .5546177 1.237756

2012 | 1.179945 .2303247 0.85 0.397 .8048364 1.72988

2012.25 | 1.138003 .242277 0.61 0.544 .7497658 1.727275

2012.5 | 1.454991 .3088932 1.77 0.077 .9597345 2.205818

2012.75 | .8775103 .1888527 -0.61 0.544 .5755215 1.337959

2013 | .9029905 .1937389 -0.48 0.634 .5930014 1.375025

2013.25 | .6961283 .1560831 -1.62 0.106 .4485763 1.080295

2013.5 | .9818075 .2217283 -0.08 0.935 .6306576 1.528477

2013.75 | 1.01088 .2338219 0.05 0.963 .6424094 1.590695

2014 | .6614652 .1473169 -1.86 0.063 .4274973 1.023483

2014.25 | .808159 .1887506 -0.91 0.362 .5113207 1.277321

2014.5 | .9678806 .2113409 -0.15 0.881 .6308967 1.484859

2014.75 | .9208911 .2060732 -0.37 0.713 .5939226 1.427863

2015 | .8646227 .2029331 -0.62 0.535 .5458126 1.36965

2015.25 | .8851775 .2138802 -0.50 0.614 .551264 1.42135

2015.5 | 1.34836 .3099318 1.30 0.193 .8593101 2.115736

2015.75 | .6261696 .1633744 -1.79 0.073 .3754951 1.04419

2016 | 1.013181 .2523861 0.05 0.958 .6218 1.650911

|

\_cons | 7.78e-06 1.34e-06 -68.37 0.000 5.55e-06 .0000109

lnhours | 1 (offset)

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

(est1 stored)

**. lfit**

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

number of observations = 12954

number of covariate patterns = 12954

Pearson chi2(12602) = 42057.41

Prob > chi2 = 0.0000

**. linktest**

Iteration 0: log likelihood = -7658.2253

Iteration 1: log likelihood = -5630.9913

Iteration 2: log likelihood = -5552.0651

Iteration 3: log likelihood = -5548.4644

Iteration 4: log likelihood = -5548.4585

Iteration 5: log likelihood = -5548.4585

Logistic regression Number of obs = 12,954

LR chi2(2) = 4219.53

Prob > chi2 = 0.0000

Log likelihood = -5548.4585 Pseudo R2 = 0.2755

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

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

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

\_hat | 1.043367 .0266111 39.21 0.000 .99121 1.095524

\_hatsq | .0325389 .0105623 3.08 0.002 .0118372 .0532407

\_cons | -.0310345 .029263 -1.06 0.289 -.0883889 .0263198

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

**. estat classification**

Logistic model for MR\_indicator

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

Classified | D ~D | Total

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

+ | 1748 704 | 2452

- | 1855 8647 | 10502

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

Total | 3603 9351 | 12954

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

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

Sensitivity Pr( +| D) 48.52%

Specificity Pr( -|~D) 92.47%

Positive predictive value Pr( D| +) 71.29%

Negative predictive value Pr(~D| -) 82.34%

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

False + rate for true ~D Pr( +|~D) 7.53%

False - rate for true D Pr( -| D) 51.48%

False + rate for classified + Pr(~D| +) 28.71%

False - rate for classified - Pr( D| -) 17.66%

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

Correctly classified 80.25%

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

**. summ MR\_indicator spbpp3\_yhat**

Variable | Obs Mean Std. Dev. Min Max

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

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

spbpp3\_yhat | 22,375 .2388105 .2325385 8.21e-06 .998705