



```

name: <unnamed>
log: D:\Dropbox\geography and terror (3)\paper\cmps submission\third submissio
> n\final-submit_10june2018\manuscript_replication_log.smcl
log type: smcl
opened on: 13 Jun 2018, 11:18:44

1 . clear

2 . use Geog_Terror_Data_FINAL

3 . tsset gid year
   panel variable:  gid (strongly balanced)
   time variable:  year, 1968 to 2013
   delta: 1 unit

4 .
5 . set more off

6 .
7 . * Variable lists for models without nighttime lights
8 . global cv_conf civilconflict bdist1_100 capdist_100 urban_100 ipolpop2_1000 log_gc
> p_ppp90 excluded excluded_squared imr_100 prec_1000 landarea_100 spatiaallag

9 . global cv_noconf bdist1_100 capdist_100 urban_100 ipolpop2_1000 log_g
> cp_ppp90 excluded excluded_squared imr_100 prec_1000 landarea_100 spatiaallag

10. global cv_conf_interaction civilconflict bdist1_100 civconfXborderdist capdist_100 c
> ivconfXcapital urban_100 ipolpop2_1000 log_gcp_ppp90 excluded excluded_squared i
> mr_100 prec_1000 landarea_100 spatiaallag

11.
12. * Variable lists for models with nighttime lights
13. global cv_conf_night civilconflict bdist1_100 capdist_100 urban_100 ipolpop2_1000
> log_gcp_ppp90 excluded excluded_squared imr_100 prec_1000 landarea_100 nlights_cal
> ib_mean spatiaallag

14. global cv_noconf_night bdist1_100 capdist_100 urban_100 ipolpop2_1000
> log_gcp_ppp90 excluded excluded_squared imr_100 prec_1000 landarea_100 nlights_ca
> lib_mean spatiaallag

15. global cv_conf_interaction_night civilconflict bdist1_100 civconfXborderdist capdi
> st_100 civconfXcapital urban_100 ipolpop2_1000 log_gcp_ppp90 excluded excluded_s
> quared imr_100 prec_1000 landarea_100 nlights_calib_mean spatiaallag

16.
17. *variable lists for single country cases
18. global cv_conf_noex2 civilconflict bdist1_100 capdist_100 urban_100 ipolpop2_1000
> log_gcp_ppp90 excluded imr_100 prec_1000 landarea_100 spatiaallag

19. global cv_noconf_noex2 bdist1_100 capdist_100 urban_100 ipolpop2_1000
> log_gcp_ppp90 excluded imr_100 prec_1000 landarea_100 spatiaallag

20. global cv_conf_noimr civilconflict bdist1_100 capdist_100 urban_100 ipolpop2_1000
> log_gcp_ppp90 excluded excluded_squared prec_1000 landarea_100 spatiaallag

21. global cv_noconf_noimr bdist1_100 capdist_100 urban_100 ipolpop2_1000
> log_gcp_ppp90 excluded excluded_squared prec_1000 landarea_100 spatiaallag

22. global cv_conf_noimr_noex2 civilconflict bdist1_100 capdist_100 urban_100 ipolpop
> 2_1000 log_gcp_ppp90 excluded prec_1000 landarea_100 spatiaallag

```

```

23. global cv_noconf_noimr_noex2          bdist1_100 capdist_100 urban_100    ipolpop
   > 2_1000 log_gcp_ppp90 excluded      prec_1000 landarea_100  spatallag

24. global cv_conf_noex2_nocont civilconflict urban_100 capdist_100 bdist1_100    ipolpop
   > 2_1000 log_gcp_ppp90 excluded spatallag

25.
26. *variable lists for dom and internationalized conflicts
27. global intl_cv_conf_interaction intlcivilconflict bdist1_100 intlcvconfXborderdist
   > capdist_100 intlcvconfXcapital urban_100    ipolpop2_1000 log_gcp_ppp90 excluded ex
   > cluded_squared imr_100 prec_1000 landarea_100 spatallag

28. global dom_cv_conf_interaction domcivilconflict bdist1_100 domcivconfXborderdist cap
   > dist_100 domcivconfXcapital urban_100    ipolpop2_1000 log_gcp_ppp90 excluded exclud
   > ed_squared imr_100 prec_1000 landarea_100 spatallag

29.
30. *****
31. ***      Table 1: Cell-Year Rare Events Logit      ***
32. *****
33. eststo clear

34. eststo: relogit terror $cv_conf_interaction lagterror lag2terror, cluster(gid)
   (1306775 missing values generated)

```

Corrected logit estimates Number of obs = 1674853

terror	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
civilconflict	1.310206	.1102608	11.88	0.000	1.094099	1.526313
bdist1_100	-.1345166	.0175087	-7.68	0.000	-.168833	-.1002001
civconfXborderdist	-.0164227	.0332289	-0.49	0.621	-.0815502	.0487048
capdist_100	-.0603999	.0082645	-7.31	0.000	-.076598	-.0442017
civconfXcapital	-.0583889	.0174631	-3.34	0.001	-.092616	-.0241619
urban_100	.1577438	.0290062	5.44	0.000	.1008927	.2145949
ipolpop2_1000	.2345283	.0310795	7.55	0.000	.1736135	.2954431
log_gcp_ppp90	.664514	.0430491	15.44	0.000	.5801394	.7488886
excluded	.3599886	.0928029	3.88	0.000	.1780983	.5418789
excluded_squared	-.071031	.0379228	-1.87	0.061	-.1453583	.0032962
imr_100	.0117908	.0097531	1.21	0.227	-.0073249	.0309065
prec_1000	.5405143	.1563067	3.46	0.001	.2341588	.8468698
landarea_100	-.0095174	.0051335	-1.85	0.064	-.0195788	.0005441
spatallag	.574096	.0595961	9.63	0.000	.4572898	.6909022
lagterror	2.670457	.0792053	33.72	0.000	2.515217	2.825696
lag2terror	2.336279	.0874318	26.72	0.000	2.164916	2.507642
_cons	-5.530738	.1484938	-37.25	0.000	-5.821781	-5.239696

(est1 stored)

```

35. eststo: relogit terror $cv_noconf lagterror lag2terror, cluster(gid)
   (1087175 missing values generated)

```

Corrected logit estimates Number of obs = 1894453

terror	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
bdist1_100	-.1235534	.0140934	-8.77	0.000	-.1511759	-.0959309
capdist_100	-.0703372	.0080918	-8.69	0.000	-.0861968	-.0544777
urban_100	.1676114	.0282162	5.94	0.000	.1123087	.2229142
ipolpop2_1000	.0077709	.0012497	6.22	0.000	.0053216	.0102201
log_gcp_ppp90	.7919582	.0370022	21.40	0.000	.7194353	.8644811
excluded	.4053287	.0813784	4.98	0.000	.2458299	.5648274
excluded_squared	-.0744118	.0333393	-2.23	0.026	-.1397557	-.009068
imr_100	.0684138	.0092039	7.43	0.000	.0503745	.0864531
prec_1000	.7001582	.1643769	4.26	0.000	.3779855	1.022331
landarea_100	-.0031485	.0050662	-0.62	0.534	-.013078	.0067811

spatiallag	.6723532	.0579688	11.60	0.000	.5587365	.7859699
lagterror	2.924355	.0733433	39.87	0.000	2.780604	3.068105
lag2terror	2.585021	.0770288	33.56	0.000	2.434047	2.735995
_cons	-5.791296	.1419834	-40.79	0.000	-6.069578	-5.513014

(est2 stored)

36. eststo: relogit terror \$cv_conf_interaction_night lagterror lag2terror, cluster(gid)
>
(2244620 missing values generated)

Corrected logit estimates Number of obs = 737008

terror	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
civilconflict	1.628647	.1484715	10.97	0.000	1.337648	1.919645
bdist1_100	-.1446703	.0249792	-5.79	0.000	-.1936287	-.095712
civconfXborderdist	-.0478079	.0437069	-1.09	0.274	-.1334718	.037856
capdist_100	-.094143	.0126215	-7.46	0.000	-.1188806	-.0694054
civconfXcapital	-.0777876	.0224461	-3.47	0.001	-.1217812	-.033794
urban_100	.1152045	.0267728	4.30	0.000	.0627308	.1676781
ipolpop2_1000	.1628874	.0314275	5.18	0.000	.1012907	.2244841
log_gcp_ppp90	.0595621	.0822269	0.72	0.469	-.1015996	.2207239
excluded	.2836236	.1250582	2.27	0.023	.038514	.5287332
excluded_squared	-.0397867	.0582104	-0.68	0.494	-.1538769	.0743036
imr_100	.062563	.0109368	5.72	0.000	.0411272	.0839988
prec_1000	.7118963	.1708432	4.17	0.000	.3770497	1.046743
landarea_100	-.022522	.0068125	-3.31	0.001	-.0358742	-.0091698
nlights_calib_mean	3.485814	.3701811	9.42	0.000	2.760272	4.211355
spatiallag	.9975672	.2146777	4.65	0.000	.5768066	1.418328
lagterror	2.569933	.11029	23.30	0.000	2.353769	2.786098
lag2terror	1.875508	.1247453	15.03	0.000	1.631012	2.120005
_cons	-5.673813	.1998077	-28.40	0.000	-6.065429	-5.282197

(est3 stored)

37. eststo: relogit terror \$cv_noconf_night lagterror lag2terror, cluster(gid)
(2069129 missing values generated)

Corrected logit estimates Number of obs = 912499

terror	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
bdist1_100	-.1287883	.0188777	-6.82	0.000	-.1657878	-.0917887
capdist_100	-.108685	.0117574	-9.24	0.000	-.1317291	-.0856408
urban_100	.1227363	.0284816	4.31	0.000	.0669135	.1785592
ipolpop2_1000	.0726802	.0260152	2.79	0.005	.0216913	.123669
log_gcp_ppp90	.1350713	.0721966	1.87	0.061	-.0064314	.276574
excluded	.3263134	.1068096	3.06	0.002	.1169703	.5356565
excluded_squared	-.0391624	.0474003	-0.83	0.409	-.1320652	.0537405
imr_100	.1238526	.0101326	12.22	0.000	.1039931	.1437121
prec_1000	.5903535	.2001324	2.95	0.003	.1981011	.9826058
landarea_100	-.018466	.0064525	-2.86	0.004	-.0311127	-.0058192
nlights_calib_mean	3.62016	.3400721	10.65	0.000	2.953631	4.286689
spatiallag	1.303117	.2351892	5.54	0.000	.8421547	1.764079
lagterror	2.726758	.108461	25.14	0.000	2.514179	2.939338
lag2terror	2.089317	.1137076	18.37	0.000	1.866454	2.31218
_cons	-5.822746	.1905413	-30.56	0.000	-6.1962	-5.449292

(est4 stored)

```
38. esttab using CellYearRelogit_unform.tex, title(Cell-Year Level Rare Events Logit) se
> pr2 replace nonumbers label booktabs mtitles("Rare Events Logit" "Negative Binomial
> " ) compress
(output written to CellYearRelogit_unform.tex)
```

```
39.
40.
41. *****
42. ***      Figure 2: Marginal Effect of Capital Distance: Percent Change      ***
43. ***      Relative to Capital                                             ***
44. *****
45. relogit terror $cv_conf_interaction lagterror lag2terror, cluster(gid)
(1306775 missing values generated)
```

Corrected logit estimates Number of obs = 1674853

terror	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
civilconflict	1.310206	.1102608	11.88	0.000	1.094099	1.526313
bdist1_100	-.1345166	.0175087	-7.68	0.000	-.168833	-.1002001
civconfXborderdist	-.0164227	.0332289	-0.49	0.621	-.0815502	.0487048
capdist_100	-.0603999	.0082645	-7.31	0.000	-.076598	-.0442017
civconfXcapital	-.0583889	.0174631	-3.34	0.001	-.092616	-.0241619
urban_100	.1577438	.0290062	5.44	0.000	.1008927	.2145949
ipolpop2_1000	.2345283	.0310795	7.55	0.000	.1736135	.2954431
log_gcp_ppp90	.664514	.0430491	15.44	0.000	.5801394	.7488886
excluded	.3599886	.0928029	3.88	0.000	.1780983	.5418789
excluded_squared	-.071031	.0379228	-1.87	0.061	-.1453583	.0032962
imr_100	.0117908	.0097531	1.21	0.227	-.0073249	.0309065
prec_1000	.5405143	.1563067	3.46	0.001	.2341588	.8468698
landarea_100	-.0095174	.0051335	-1.85	0.064	-.0195788	.0005441
spatiallag	.574096	.0595961	9.63	0.000	.4572898	.6909022
lagterror	2.670457	.0792053	33.72	0.000	2.515217	2.825696
lag2terror	2.336279	.0874318	26.72	0.000	2.164916	2.507642
_cons	-5.530738	.1484938	-37.25	0.000	-5.821781	-5.239696

```
46. setx mean
47.
48. postutil clear
49. postfile mypost5 probY5 upper5 lower5 xaxis5 using simresults5, replace
50. noisily display "start"
    start
51. setx civilconflict 1
52. set obs 2981628
    obs was 2981628, now 2981628
53. local a = 0
54. while `a' < 81 { //41 is the p90 of capdist 81 max
    2. setx capdist_100 (`a') //set age at the new value
    3. qui relogitq, rr(capdist_100 0 (`a') civconfXcapital 0 (`a')) //generate the pred
    > icted value scalars
    4. scalar probY5 = 100*(r(rr_1)-1)
    5. scalar upper5 = 100*(r(rrU_1)-1)
    6. scalar lower5 = 100*(r(rrL_1)-1)
    7. scalar xaxis5 = `a'
    8. post mypost5 (probY5) (upper5) (lower5) (xaxis5)
    9. local a = `a'+1
    10. local xaxis5 = `a' //move across the xaxis by "a" units, here +1 year
    11. display "." _c
    12. }
.....
```

```

55. display ""

56.
57. postclose mypost5 /* now we have the numbers we need, so close the post */

58. merge using simresults5 //merge in the results to our dataset
   (note: you are using old merge syntax; see \[D\] merge for new syntax)

59.
60. *cap dist from cap to p90 without civil conflict
61. drop _merge

62. setx mean

63. postutil clear

64. postfile mypost probY6 upper6 lower6 xaxis6 using simresults6, replace

65. noisily display "start"
   start

66. setx civconfXcapital 0

67. setx civilconflict 0

68. set obs 2981628
   obs was 2981628, now 2981628

69. local a = 0

70. while `a' < 81 { //41 is the p90 of bdistdist
   2. setx capdist_100 (`a') //set age at the new value
   3. qui relogitq, rr(capdist_100 0 `a') //generate the predicted value scalars
   4. scalar probY6 = 100*(r(rr_1)-1)
   5. scalar upper6 = 100*(r(rrU_1)-1)
   6. scalar lower6 = 100*(r(rrL_1)-1)
   7. scalar xaxis6 = `a'
   8. post mypost (probY6) (upper6) (lower6) (xaxis6)
   9. local a = `a'+1
  10. local xaxis6 = `a' //move across the xaxis by "a" units, here +1 year
  11. display "." _c
  12. }
.....
71. display ""

72.
73. postclose mypost /* now we have the numbers we need, so close the post */

74.
75. merge using simresults6 //merge in the results to our dataset
   (note: you are using old merge syntax; see \[D\] merge for new syntax)

76.
77.
78. *Create Figure 2 based on the above marginal effects simulations
79.
80. graph twoway line probY5 xaxis5, clwidth(medium) clcolor(edkblue) clpattern(solid)
   > ///
   > || line lower5 xaxis5, clpattern(dash) clwidth(thin) clcolor(edkblue) ///
   > || line upper5 xaxis5, clpattern(dash) clwidth(thin) clcolor(edkblue) ///
   > || line probY6 xaxis6, clwidth(medium) clcolor(stone) clpattern(solid)
   > d) ///
   > || line lower6 xaxis6, clpattern(dash) clwidth(thin) clcolor(stone) ///
   > || line upper6 xaxis6, clpattern(dash) clwidth(thin) clcolor(stone) ///
   > ytitle(Percent Change in Relative Risk) xtitle(Distance From Capital
   > (100s km))

```

```

81.
82.
83.
84. *****
85. ***      Figure 3: Marginal Effect of Civil Conflict: Percent Change      ***
86. ***      Relative to No Conflict                                          ***
87. *****
>
88. relogit terror $cv_conf_interaction lagterror lag2terror, cluster(gid)
    (1306775 missing values generated)

```

Corrected logit estimates Number of obs = 1674853

terror	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
civilconflict	1.310206	.1102608	11.88	0.000	1.094099	1.526313
bdist1_100	-.1345166	.0175087	-7.68	0.000	-.168833	-.1002001
civconfXborderdist	-.0164227	.0332289	-0.49	0.621	-.0815502	.0487048
capdist_100	-.0603999	.0082645	-7.31	0.000	-.076598	-.0442017
civconfXcapital	-.0583889	.0174631	-3.34	0.001	-.092616	-.0241619
urban_100	.1577438	.0290062	5.44	0.000	.1008927	.2145949
ipolpop2_1000	.2345283	.0310795	7.55	0.000	.1736135	.2954431
log_gcp_ppp90	.664514	.0430491	15.44	0.000	.5801394	.7488886
excluded	.3599886	.0928029	3.88	0.000	.1780983	.5418789
excluded_squared	-.071031	.0379228	-1.87	0.061	-.1453583	.0032962
imr_100	.0117908	.0097531	1.21	0.227	-.0073249	.0309065
prec_1000	.5405143	.1563067	3.46	0.001	.2341588	.8468698
landarea_100	-.0095174	.0051335	-1.85	0.064	-.0195788	.0005441
spatiallag	.574096	.0595961	9.63	0.000	.4572898	.6909022
lagterror	2.670457	.0792053	33.72	0.000	2.515217	2.825696
lag2terror	2.336279	.0874318	26.72	0.000	2.164916	2.507642
_cons	-5.530738	.1484938	-37.25	0.000	-5.821781	-5.239696

```

89. setx mean
90.
91. postutil clear
92. postfile mypost probY upper lower xaxis using simresults1, replace
93. noisily display "start"
    start
94.
95. local a = 0
96. while `a' < 81 { //80 is the max of capdist
    2. setx capdist_100 (`a') //set age at the new value
    3. qui relogitq, rr(civilconflict 0 1 civconfXcapital 0 (`a')) //generate the predic
    > ted value scalars
    4. scalar probY= 100*(r(rr_1)-1)
    5. scalar upper = 100*(r(rrU_1)-1)
    6. scalar lower = 100*(r(rrL_1)-1)
    7. scalar xaxis = `a'
    8. post mypost (probY) (upper) (lower) (xaxis)
    9. local a = `a'+1
    10. local xaxis = `a' //move across the xaxis by "a" units, here +1 year
    11. display "." _c
    12. }
.....

```

```

97. display ""
98.
99. postclose mypost /* now we have the numbers we need, so close the post */
100
101 drop _merge
102 merge using simresults1 //merge in the results to our dataset
    (note: you are using old merge syntax; see \[D\] merge for new syntax)
103
104 gsort probY upper lower -xaxis
105
106 twoway line probY axis, clwidth(medium) clcolor(black) clpattern(solid) ///
    >     || line lower axis, clpattern(dash) clwidth(thin) clcolor(gray) ///
    >     || line upper axis, clpattern(dash) clwidth(thin) clcolor(gray) ///
    >     ytitle(Percentage Change in Relative Risk) xtitle(Distance to Capita
    > l (100s km)) name(confciv, replace) leg(off)
107
108     twoway histogram capdist_100, name(capdisthist, replace) fysize(20) fractio
    > n
109
110     gr combine confciv capdisthist, imargin(0 0 0 0) xcommon hole(3) cols(1)
111
112
113 *****
114 *** Table 2: Cell-Year Level Negative Binomial Regression ***
115 *****
116 eststo clear
117 eststo: nbreg eventcount $cv_conf_interaction lageventcount lag2eventcount, cluster
    > (gid)

Fitting Poisson model:

initial:      log pseudolikelihood = -1685081.5
alternative:  log pseudolikelihood = -1031349.7
rescale:     log pseudolikelihood = -83076.525
Iteration 0: log pseudolikelihood = -83076.525
Iteration 1: log pseudolikelihood = -74215.456 (backed up)
Iteration 2: log pseudolikelihood = -64553.386
Iteration 3: log pseudolikelihood = -50812.851
Iteration 4: log pseudolikelihood = -42238.652
Iteration 5: log pseudolikelihood = -41019.781
Iteration 6: log pseudolikelihood = -40358.544
Iteration 7: log pseudolikelihood = -40236.801
Iteration 8: log pseudolikelihood = -40232.868
Iteration 9: log pseudolikelihood = -40232.864
Iteration 10: log pseudolikelihood = -40232.864

Fitting constant-only model:

Iteration 0: log pseudolikelihood = -64008.234 (not concave)
Iteration 1: log pseudolikelihood = -40826.812
Iteration 2: log pseudolikelihood = -37414.936
Iteration 3: log pseudolikelihood = -37106.548
Iteration 4: log pseudolikelihood = -37104.313
Iteration 5: log pseudolikelihood = -37104.313

Fitting full model:

```

```
Iteration 0: log pseudolikelihood = -37104.313 (not concave)
Iteration 1: log pseudolikelihood = -31777.356
Iteration 2: log pseudolikelihood = -31049.346
Iteration 3: log pseudolikelihood = -27647.553
Iteration 4: log pseudolikelihood = -26796.92
Iteration 5: log pseudolikelihood = -26640.192
Iteration 6: log pseudolikelihood = -26634.634
Iteration 7: log pseudolikelihood = -26634.616
Iteration 8: log pseudolikelihood = -26634.616
```

```
Negative binomial regression
Dispersion = mean
Log pseudolikelihood = -26634.616
Number of obs = 1674853
Wald chi2(16) = 2137.38
Prob > chi2 = 0.0000
```

(Std. Err. adjusted for 44300 clusters in gid)

eventcount	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
civilconflict	1.53681	.136373	11.27	0.000	1.269524	1.804096
bdistl_100	-.119819	.0242634	-4.94	0.000	-.1673744	-.0722636
civconfXborderdist	-.0268664	.0435343	-0.62	0.537	-.1121921	.0584592
capdist_100	-.0657658	.0087497	-7.52	0.000	-.082915	-.0486167
civconfXcapital	-.0772347	.0197193	-3.92	0.000	-.1158838	-.0385856
urban_100	.1290939	.0223677	5.77	0.000	.0852539	.1729339
ipolpop2_1000	.6013666	.0577326	10.42	0.000	.4882128	.7145203
log_gcp_ppp90	.7096469	.0561966	12.63	0.000	.5995037	.8197902
excluded	.4828116	.1155871	4.18	0.000	.256265	.7093583
excluded_squared	-.1069111	.0457247	-2.34	0.019	-.1965297	-.0172924
imr_100	.0068484	.0114741	0.60	0.551	-.0156403	.0293372
prec_1000	.5219836	.1834982	2.84	0.004	.1623338	.8816334
landarea_100	-.0132429	.0057474	-2.30	0.021	-.0245075	-.0019782
spatiallag	1.669992	.2524398	6.62	0.000	1.175219	2.164765
lageventcount	1.351746	.1534713	8.81	0.000	1.050948	1.652544
lag2eventcount	1.022831	.175786	5.82	0.000	.678297	1.367365
_cons	-5.466069	.1818828	-30.05	0.000	-5.822553	-5.109585
/lnalpha	2.913339	.0914272			2.734145	3.092533
alpha	18.4182	1.683924			15.39658	22.03282

(est1 stored)

```
118 eststo: nbreg eventcount $cv_noconf lageventcount lag2eventcount, cluster(gid)
```

Fitting Poisson model:

```
initial: log pseudolikelihood = -1904877.1
alternative: log pseudolikelihood = -1165004.4
rescale: log pseudolikelihood = -89414.218
Iteration 0: log pseudolikelihood = -89414.218
Iteration 1: log pseudolikelihood = -80568.356 (backed up)
Iteration 2: log pseudolikelihood = -79017.127
Iteration 3: log pseudolikelihood = -63212.942
Iteration 4: log pseudolikelihood = -50251.953
Iteration 5: log pseudolikelihood = -47901.676
Iteration 6: log pseudolikelihood = -46607.855
Iteration 7: log pseudolikelihood = -46288.931
Iteration 8: log pseudolikelihood = -46261.019
Iteration 9: log pseudolikelihood = -46260.969
Iteration 10: log pseudolikelihood = -46260.969
```

Fitting constant-only model:

```
Iteration 0: log pseudolikelihood = -68044.609 (not concave)
Iteration 1: log pseudolikelihood = -43458.178
Iteration 2: log pseudolikelihood = -40351.8
Iteration 3: log pseudolikelihood = -40155.207
Iteration 4: log pseudolikelihood = -40154.617
Iteration 5: log pseudolikelihood = -40154.617
```


Fitting full model:

```
Iteration 0: log pseudolikelihood = -40154.617 (not concave)
Iteration 1: log pseudolikelihood = -34711.276
Iteration 2: log pseudolikelihood = -33486.423
Iteration 3: log pseudolikelihood = -30628.895
Iteration 4: log pseudolikelihood = -29778.681
Iteration 5: log pseudolikelihood = -29516.134
Iteration 6: log pseudolikelihood = -29498.753
Iteration 7: log pseudolikelihood = -29498.554
Iteration 8: log pseudolikelihood = -29498.553
```

```
Negative binomial regression          Number of obs   =   1894453
Dispersion = mean                    Wald chi2(13)  =   1861.99
Log pseudolikelihood = -29498.553    Prob > chi2    =    0.0000
```

(Std. Err. adjusted for 44300 clusters in gid)

eventcount	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
bdist1_100	-.1187114	.0197009	-6.03	0.000	-.1573245	-.0800983
capdist_100	-.0733246	.008473	-8.65	0.000	-.0899314	-.0567178
urban_100	.1387132	.0219675	6.31	0.000	.0956577	.1817687
ipolpop2_1000	.3898782	.0618964	6.30	0.000	.2685635	.5111928
log_gcp_ppp90	.7842515	.0601948	13.03	0.000	.666272	.9022311
excluded	.5051769	.1058293	4.77	0.000	.2977553	.7125985
excluded_squared	-.1120279	.0429673	-2.61	0.009	-.1962422	-.0278136
imr_100	.0634032	.010731	5.91	0.000	.0423708	.0844356
prec_1000	.6844655	.1937495	3.53	0.000	.3047235	1.064208
landarea_100	-.0084474	.0057967	-1.46	0.145	-.0198087	.0029138
spatiallag	2.344393	.3019483	7.76	0.000	1.752585	2.9362
lageventcount	1.548809	.1451313	10.67	0.000	1.264357	1.833261
lag2eventcount	1.23183	.1997601	6.17	0.000	.8403075	1.623353
_cons	-5.642047	.1784721	-31.61	0.000	-5.991846	-5.292248
/lnalpha	3.103652	.0883019			2.930583	3.27672
alpha	22.27916	1.967292			18.73856	26.48876

(est2 stored)

```
119 eststo: nbreg eventcount $cv_conf_interaction_night lageventcount lag2eventcount, c
> luster(gid)
```

Fitting Poisson model:

```
initial: log pseudolikelihood = -738674.38
alternative: log pseudolikelihood = -450003.83
rescale: log pseudolikelihood = -23025.621
Iteration 0: log pseudolikelihood = -23025.621
Iteration 1: log pseudolikelihood = -21545.363 (backed up)
Iteration 2: log pseudolikelihood = -19854.525 (backed up)
Iteration 3: log pseudolikelihood = -16689.495
Iteration 4: log pseudolikelihood = -14753.318
Iteration 5: log pseudolikelihood = -11990.74
Iteration 6: log pseudolikelihood = -11782.315
Iteration 7: log pseudolikelihood = -11766.189
Iteration 8: log pseudolikelihood = -11766.156
Iteration 9: log pseudolikelihood = -11766.156
```

Fitting constant-only model:

```
Iteration 0: log pseudolikelihood = -17507.091 (not concave)
Iteration 1: log pseudolikelihood = -12420.452
Iteration 2: log pseudolikelihood = -12291.437
Iteration 3: log pseudolikelihood = -12291.233
Iteration 4: log pseudolikelihood = -12291.233
```

Fitting full model:

```
Iteration 0: log pseudolikelihood = -12291.233 (not concave)
Iteration 1: log pseudolikelihood = -10064.903
Iteration 2: log pseudolikelihood = -9512.9374
Iteration 3: log pseudolikelihood = -9113.0488
Iteration 4: log pseudolikelihood = -9005.586
Iteration 5: log pseudolikelihood = -8870.0152
Iteration 6: log pseudolikelihood = -8864.3219
Iteration 7: log pseudolikelihood = -8864.2821
Iteration 8: log pseudolikelihood = -8864.2821
```

```
Negative binomial regression
Dispersion = mean
Log pseudolikelihood = -8864.2821
Number of obs = 737008
Wald chi2(17) = 1600.99
Prob > chi2 = 0.0000
```

(Std. Err. adjusted for 44063 clusters in gid)

eventcount	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
civilconflict	1.58954	.1994019	7.97	0.000	1.198719	1.980361
bdist1_100	-.0892596	.0358326	-2.49	0.013	-.1594903	-.0190289
civconfXborderdist	-.0770223	.0624493	-1.23	0.217	-.1994207	.0453761
capdist_100	-.0840826	.0128461	-6.55	0.000	-.1092606	-.0589047
civconfXcapital	-.0661851	.0251454	-2.63	0.008	-.1154692	-.0169011
urban_100	.0958861	.0225293	4.26	0.000	.0517295	.1400428
ipolpop2_1000	.4212848	.0644813	6.53	0.000	.2949037	.5476659
log_gcp_ppp90	-.039977	.0937491	-0.43	0.670	-.2237219	.1437679
excluded	.3754749	.1285581	2.92	0.003	.1235056	.6274442
excluded_squared	-.0505371	.0512332	-0.99	0.324	-.1509523	.049878
imr_100	.0679044	.0127388	5.33	0.000	.0429368	.092872
prec_1000	.6592404	.2162694	3.05	0.002	.2353601	1.083121
landarea_100	-.0218324	.008961	-2.44	0.015	-.0393956	-.0042692
nlights_calib_mean	4.079621	.455024	8.97	0.000	3.18779	4.971452
spatiallag	4.596094	.8726801	5.27	0.000	2.885672	6.306516
lageventcount	1.663926	.2817744	5.91	0.000	1.111658	2.216193
lag2eventcount	.8169102	.1368215	5.97	0.000	.5487449	1.085075
_cons	-5.979263	.294011	-20.34	0.000	-6.555514	-5.403012
/lnalpha	2.93701	.1400641			2.662489	3.21153
alpha	18.85937	2.641519			14.33192	24.81703

(est3 stored)

```
120 eststo: nbreg eventcount $cv_noconf_night lageventcount lag2eventcount, cluster(gid > )
```

Fitting Poisson model:

```
initial: log pseudolikelihood = -914311.62
alternative: log pseudolikelihood = -556787.74
rescale: log pseudolikelihood = -26382.728
Iteration 0: log pseudolikelihood = -26382.728
Iteration 1: log pseudolikelihood = -24889.727 (backed up)
Iteration 2: log pseudolikelihood = -23613.483 (backed up)
Iteration 3: log pseudolikelihood = -18323.326
Iteration 4: log pseudolikelihood = -15639.55
Iteration 5: log pseudolikelihood = -14827.095
Iteration 6: log pseudolikelihood = -14524.524
Iteration 7: log pseudolikelihood = -14509.595
Iteration 8: log pseudolikelihood = -14509.488
Iteration 9: log pseudolikelihood = -14509.488
```

Fitting constant-only model:

```
Iteration 0: log pseudolikelihood = -20346.258 (not concave)
Iteration 1: log pseudolikelihood = -14886.224
Iteration 2: log pseudolikelihood = -14533.647
Iteration 3: log pseudolikelihood = -14530.37
Iteration 4: log pseudolikelihood = -14530.37
```

Fitting full model:

```
Iteration 0: log pseudolikelihood = -14530.37 (not concave)
Iteration 1: log pseudolikelihood = -12024.667
Iteration 2: log pseudolikelihood = -11348.705
Iteration 3: log pseudolikelihood = -10852.902
Iteration 4: log pseudolikelihood = -10726.565
Iteration 5: log pseudolikelihood = -10713.045
Iteration 6: log pseudolikelihood = -10712.921
Iteration 7: log pseudolikelihood = -10712.921
```

```
Negative binomial regression      Number of obs   =    912499
Dispersion = mean                Wald chi2(14)  =    1442.65
Log pseudolikelihood = -10712.921 Prob > chi2    =     0.0000
```

(Std. Err. adjusted for 44063 clusters in gid)

eventcount	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
bdist1_100	-.1004954	.0249001	-4.04	0.000	-.1492987	-.0516921
capdist_100	-.0960971	.0116067	-8.28	0.000	-.1188458	-.0733483
urban_100	.0916079	.022519	4.07	0.000	.0474714	.1357444
ipolpop2_1000	.3923605	.0550066	7.13	0.000	.2845495	.5001715
log_gcp_ppp90	.0085599	.0865999	0.10	0.921	-.1611727	.1782925
excluded	.3943306	.1212261	3.25	0.001	.1567319	.6319294
excluded_squared	-.0578429	.0506671	-1.14	0.254	-.1571486	.0414627
imr_100	.1161976	.0112999	10.28	0.000	.0940502	.1383451
prec_1000	.4837186	.2426047	1.99	0.046	.0082221	.9592151
landarea_100	-.0195337	.0083649	-2.34	0.020	-.0359287	-.0031387
nlights_calib_mean	3.977193	.4235374	9.39	0.000	3.147075	4.807311
spatiallag	5.769565	.7671532	7.52	0.000	4.265972	7.273157
lageventcount	1.846075	.2114608	8.73	0.000	1.43162	2.260531
lag2eventcount	1.030502	.1479734	6.96	0.000	.7404796	1.320525
_cons	-6.000975	.2520995	-23.80	0.000	-6.495081	-5.506869
/lnalpha	3.077478	.1133836			2.85525	3.299706
alpha	21.7036	2.460832			17.37878	27.10466

(est4 stored)

```
121 esttab using CellYearNBREG_uniform.tex, title(Cell-Year Level Negative Binomial) se p
> r2 replace nonumbers label booktabs mtitles("Rare Events Logit" "Negative Binomial"
> ) compress
(output written to CellYearNBREG_uniform.tex)
```

122
123
124
125
126
127
128

```
129 *****
130 ***      Table 3: Marginal Effects at Means: Percent Change in Relative Risk      ***
131 *****
132 eststo clear
```

133

134 relogit terror \$cv_conf_interaction lagterror lag2terror, cluster(gid)
 (1306775 missing values generated)

Corrected logit estimates

Number of obs = 1674853

terror	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
civilconflict	1.310206	.1102608	11.88	0.000	1.094099	1.526313
bdist1_100	-.1345166	.0175087	-7.68	0.000	-.168833	-.1002001
civconfXborderdist	-.0164227	.0332289	-0.49	0.621	-.0815502	.0487048
capdist_100	-.0603999	.0082645	-7.31	0.000	-.076598	-.0442017
civconfXcapital	-.0583889	.0174631	-3.34	0.001	-.092616	-.0241619
urban_100	.1577438	.0290062	5.44	0.000	.1008927	.2145949
ipolpop2_1000	.2345283	.0310795	7.55	0.000	.1736135	.2954431
log_gcp_ppp90	.664514	.0430491	15.44	0.000	.5801394	.7488886
excluded	.3599886	.0928029	3.88	0.000	.1780983	.5418789
excluded_squared	-.071031	.0379228	-1.87	0.061	-.1453583	.0032962
imr_100	.0117908	.0097531	1.21	0.227	-.0073249	.0309065
prec_1000	.5405143	.1563067	3.46	0.001	.2341588	.8468698
landarea_100	-.0095174	.0051335	-1.85	0.064	-.0195788	.0005441
spatiallag	.574096	.0595961	9.63	0.000	.4572898	.6909022
lagterror	2.670457	.0792053	33.72	0.000	2.515217	2.825696
lag2terror	2.336279	.0874318	26.72	0.000	2.164916	2.507642
_cons	-5.530738	.1484938	-37.25	0.000	-5.821781	-5.239696

135 setx mean

136 relogitq, rr(urban_100 p10 p90)

Relative Risk 1: urban_100 p10 p90
rr(terror==1) = 33.53419
95% Confidence Interval = 9.84950 to 106.4425

137 display 100*(r(rr_1)-1)
3253.4191

138 display 100*(r(rrU_1)-1)
10544.25

139 display 100*(r(rrL_1)-1)
884.94992

140 relogitq, rr(ipolpop2_1000 p10 p90)

Relative Risk 1: ipolpop2_1000 p10 p90
rr(terror==1) = 1.05612
95% Confidence Interval = 1.04065 to 1.0711131

141 display 100*(r(rr_1)-1)
5.6116402

142 display 100*(r(rrU_1)-1)
7.111311

143 display 100*(r(rrL_1)-1)
4.0652215

```
144 relogitq, rr(log_gcp_ppp90 p10 p90)
    Relative Risk 1: log_gcp_ppp90 p10 p90
      rr(terror==1) = 1.64668
      95% Confidence Interval = 1.55038 to 1.7683109

145 display 100*(r(rr_1)-1)
    64.668274

146 display 100*(r(rrU_1)-1)
    76.83109

147 display 100*(r(rrL_1)-1)
    55.037743

148 relogitq, rr(imr_100 p10 p90)
    Relative Risk 1: imr_100 p10 p90
      rr(terror==1) = 1.12514
      95% Confidence Interval = 0.92481 to 1.373803

149 display 100*(r(rr_1)-1)
    12.51443

150 display 100*(r(rrU_1)-1)
    37.380302

151 display 100*(r(rrL_1)-1)
    -7.5192958

152 relogitq, rr(prec_100 p10 p90)
    Relative Risk 1: prec_100 p10 p90
      rr(terror==1) = 1.24035
      95% Confidence Interval = 1.09915 to 1.3938776

153 display 100*(r(rr_1)-1)
    24.034691

154 display 100*(r(rrU_1)-1)
    39.387757

155 display 100*(r(rrL_1)-1)
    9.9152744

156 relogitq, rr(spatiallag 0 .125)
    Relative Risk 1: spatiallag 0 .125
      rr(terror==1) = 1.07417
      95% Confidence Interval = 1.05868 to 1.0905036

157 display 100*(r(rr_1)-1)
    7.4166417

158 display 100*(r(rrU_1)-1)
    9.0503573

159 display 100*(r(rrL_1)-1)
    5.8677793
```

```

160 relogitq, rr(lagterror 0 1)

Relative Risk 1: lagterror 0 1
      rr(terror==1) = 14.44169
      95% Confidence Interval = 12.36314 to 16.881484

161 display 100*(r(rr_1)-1)
      1344.1686

162 display 100*(r(rrU_1)-1)
      1588.1484

163 display 100*(r(rrL_1)-1)
      1136.3142

164 relogitq, rr(lag2terror 0 1)

Relative Risk 1: lag2terror 0 1
      rr(terror==1) = 10.26583
      95% Confidence Interval = 8.56721 to 12.263983

165 display 100*(r(rr_1)-1)
      926.58277

166 display 100*(r(rrU_1)-1)
      1126.3983

167 display 100*(r(rrL_1)-1)
      756.72097

168
169
170 *****
171 ***      Figure 4: Marginal Effect of Num. of Excluded Ethnic Groups: Percent      ***
172 ***      Change in Relative Risk      ***
173 *****
174
175
176 drop _merge probY upper lower xaxis

177 setx mean

178 postutil clear

179 postfile mypost7 probY7 upper7 lower7 xaxis7 using simresults7, replace

180 noisily display "start"
      start

181 setx civilconflict 0

182 set obs 2981628
      obs was 2981628, now 2981628

183 local a = 0

184 while `a' < 7 { //41 is the p90 of capdist 81 max
      2. setx excluded (`a') //set age at the new value
      3. qui relogitq, rr(excluded 0 (`a') excluded_squared 0 (`a')) //generate the predic
      > ted value scalars
      4. scalar probY7= 100*(r(rr_1)-1)
      5. scalar upper7 = 100*(r(rrU_1)-1)
      6. scalar lower7 = 100*(r(rrL_1)-1)
      7. scalar xaxis7 = `a'
      8. post mypost7 (probY7) (upper7) (lower7) (xaxis7)
      9. local a = `a'+1
      10. local xaxis7 = `a' //move across the xaxis by "a" units, here +1 year
      11. display "." _c
      12. }
.....

```

```

185 display ""

186
187 postclose mypost7 /* now we have the numbers we need, so close the post */

188
189 merge using simresults7 //merge in the results to our dataset
    (note: you are using old merge syntax; see \[D\] merge for new syntax)

190
191 gsort probY7 upper7 lower7 -axis7

192
193 graph twoway line probY7 xaxis7, clwidth(medium) clcolor(black) clpattern(solid) //
    > /
    > || line lower7 xaxis7, clpattern(dash) clwidth(thin) clcolor(maroon) ///
    > || line upper7 xaxis7, clpattern(dash) clwidth(thin) clcolor(maroon) ///
    > ytitle(Y-Axis Label) xtitle(X-Axis Label)

194
195 twoway line probY7 xaxis7, clwidth(medium) clcolor(black) clpattern(solid) ///
    > || line lower7 xaxis7, clpattern(dash) clwidth(thin) clcolor(gray) ///
    > || line upper7 xaxis7, clpattern(dash) clwidth(thin) clcolor(gray) ///
    > ytitle(Percentage Change in Relative Risk) xtitle(Number of Excluded
    > Ethnic Groups) name(excludedME, replace) leg(off)

196
197 twoway histogram excluded, name(excluded, replace) fysize(20) fraction

198
199 gr combine excludedME excluded, imargin(0 0 0 0) xcommon hole(3) cols(1)
    >

200
201
202 *****
    >
203 *** Propensity Score Matching Procedure ***
204 *****
205
206 nbreg eventcount $cv_conf lagterror lag2terror, dif

```

Fitting Poisson model:

```

Iteration 0: log likelihood = -7300410.4 (not concave)
Iteration 1: log likelihood = -6132190.5 (not concave)
Iteration 2: log likelihood = -5506633.6 (not concave)
Iteration 3: log likelihood = -5359318.4 (not concave)
Iteration 4: log likelihood = -5201911.3 (not concave)
Iteration 5: log likelihood = -5071103.6 (not concave)
Iteration 6: log likelihood = -4492985.5 (not concave)
Iteration 7: log likelihood = -4473873.4 (not concave)
Iteration 8: log likelihood = -4455907.2 (not concave)
Iteration 9: log likelihood = -4013166.2 (not concave)
Iteration 10: log likelihood = -3818972.3 (not concave)
Iteration 11: log likelihood = -3480714.8 (not concave)
Iteration 12: log likelihood = -3447765.1 (not concave)
Iteration 13: log likelihood = -3376469.8 (not concave)
Iteration 14: log likelihood = -3095393.4 (not concave)
Iteration 15: log likelihood = -2645292.6
Iteration 16: log likelihood = -459631.14 (backed up)
Iteration 17: log likelihood = -269295.72
Iteration 18: log likelihood = -114713.23
Iteration 19: log likelihood = -43791.429
Iteration 20: log likelihood = -37081.864
Iteration 21: log likelihood = -33783.466
Iteration 22: log likelihood = -32990.293
Iteration 23: log likelihood = -32786.434
Iteration 24: log likelihood = -32774.808
Iteration 25: log likelihood = -32774.741
Iteration 26: log likelihood = -32774.741

```

Fitting constant-only model:

```
Iteration 0: log likelihood = -64008.234 (not concave)
Iteration 1: log likelihood = -40826.812
Iteration 2: log likelihood = -37414.936
Iteration 3: log likelihood = -37106.548
Iteration 4: log likelihood = -37104.313
Iteration 5: log likelihood = -37104.313
```

Fitting full model:

```
Iteration 0: log likelihood = -37090.307 (not concave)
Iteration 1: log likelihood = -34277.708 (not concave)
Iteration 2: log likelihood = -28986.314 (not concave)
Iteration 3: log likelihood = -26445.366
Iteration 4: log likelihood = -26323.155
Iteration 5: log likelihood = -25774.544
Iteration 6: log likelihood = -25723.772
Iteration 7: log likelihood = -25722.67
Iteration 8: log likelihood = -25722.669
```

Negative binomial regression

```
Number of obs = 1674853
LR chi2(14) = 22763.29
Prob > chi2 = 0.0000
Pseudo R2 = 0.3067
```

```
Dispersion = mean
Log likelihood = -25722.669
```

eventcount	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
civilconflict	1.109784	.0442939	25.05	0.000	1.02297	1.196599
bdist1_100	-.1080691	.0073262	-14.75	0.000	-.1224282	-.09371
capdist_100	-.0682801	.0033591	-20.33	0.000	-.0748638	-.0616963
urban_100	.1372235	.0087895	15.61	0.000	.1199964	.1544506
ipolpop2_1000	.4456289	.0205195	21.72	0.000	.4054114	.4858464
log_gcp_ppp90	.6770945	.0251057	26.97	0.000	.6278882	.7263009
excluded	.421222	.0584532	7.21	0.000	.3066558	.5357883
excluded_squared	-.0914439	.0277246	-3.30	0.001	-.1457831	-.0371047
imr_100	.0116479	.0053029	2.20	0.028	.0012545	.0220414
prec_1000	.5737978	.0903651	6.35	0.000	.3966854	.7509101
landarea_100	-.0143347	.0029082	-4.93	0.000	-.0200346	-.0086348
spatiallag	1.265043	.0760031	16.64	0.000	1.116079	1.414006
lagterror	3.159013	.0670417	47.12	0.000	3.027614	3.290413
lag2terror	2.688568	.0720685	37.31	0.000	2.547316	2.829819
_cons	-5.4364	.0808585	-67.23	0.000	-5.59488	-5.277921
/lnalpha	2.315632	.0336426			2.249693	2.38157
alpha	10.13132	.3408443			9.484826	10.82188

Likelihood-ratio test of alpha=0: chibar2(01) = 1.4e+04 Prob>=chibar2 = 0.000

```
207
208 //drop obs with missing values
209
210 keep if e(sample)==1
    (1306775 observations deleted)

211
212 set more off
```



```

213
214 /* Randomize the order of the Data */
215 set seed 32306

216 gen random =uniform()*100

217
218 sort random year

219
220 #delimit ;
    delimiter now ;
221 psmatch2 civilconflict $cv_noconf,
    > outcome(eventcount) noreplacement common desc ;

```

```

Probit regression                               Number of obs   =   1674853
                                                LR chi2(11)    =   202356.42
                                                Prob > chi2    =    0.0000
Log likelihood = -337588.56                    Pseudo R2      =    0.2306

```

civilconfl~t	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
bdist1_100	-.0172671	.0005699	-30.30	0.000	-.0183842	-.0161501
capdist_100	-.0398577	.0003237	-123.14	0.000	-.0404921	-.0392233
urban_100	.0132158	.0002913	45.36	0.000	.0126448	.0137868
ipolpop~1000	.1983345	.0035311	56.17	0.000	.1914138	.2052553
log_gcp_p~90	-.062247	.0047641	-13.07	0.000	-.0715846	-.0529095
excluded	.3952983	.0054225	72.90	0.000	.3846703	.4059262
excluded_s~d	-.1095202	.0025328	-43.24	0.000	-.1144844	-.1045559
imr_100	.0801782	.0004343	184.63	0.000	.0793271	.0810294
prec_1000	.6950445	.0080126	86.74	0.000	.6793402	.7107489
landarea_100	.0233572	.0003625	64.43	0.000	.0226467	.0240677
spatiallag	.5400661	.013335	40.50	0.000	.51393	.5662022
_cons	-2.249989	.0100337	-224.24	0.000	-2.269655	-2.230324

Note: 2 failures and 0 successes completely determined.
There are observations with identical propensity score values.
The sort order of the data could affect your results.
Make sure that the sort order is random before calling psmatch2.

Variable	Sample	Treated	Controls	Difference	S.E.	T-st
eventcount	Unmatched	.027932642	.004584564	.023348078	.000717146	32.
	ATT	.027932642	.014247522	.01368512	.002066066	6.

Note: S.E. does not take into account that the propensity score is estimated.

psmatch2: Treatment assignment	psmatch2: Common support On suppor	Total
Untreated	1,552,165	1,552,165
Treated	122,688	122,688
Total	1,674,853	1,674,853

```
222 #delimit cr
    delimiter now cr
223
224 eststo clear
```

```
225
226 pstest bdist1_100 capdist_100 urban_100 ipolpop2_1000 log_gcp_ppp90 excluded excl
> uded_squared imr_100 prec_1000 landarea_100 spatiallag, both graph
```

Variable	Unmatched Matched	Mean		%bias	%reduct bias	t-test	
		Treated	Control			t	p> t
bdist1_100	Unmatched	2.383	5.3654	-67.3		-180.16	0.000
	Matched	2.383	2.2807	2.3	96.6	9.60	0.000
capdist_100	Unmatched	6.3859	18.422	-99.8		-255.33	0.000
	Matched	6.3859	6.1915	1.6	98.4	10.45	0.000
urban_100	Unmatched	-5.1943	-9.1415	36.6		97.91	0.000
	Matched	-5.1943	-5.265	0.7	98.2	2.95	0.003
ipolpop2_1000	Unmatched	.21509	.09374	26.4		109.83	0.000
	Matched	.21509	.20332	2.6	90.3	4.69	0.000
log_gcp_ppp90	Unmatched	.23852	.23815	0.1		0.27	0.786
	Matched	.23852	.23164	1.6	-1756.5	4.11	0.000
excluded	Unmatched	.61912	.54804	11.0		38.46	0.000
	Matched	.61912	.60957	1.5	86.6	3.49	0.000
excluded_sq~d	Unmatched	.83261	.68406	10.7		39.30	0.000
	Matched	.83261	.8391	-0.5	95.6	-1.11	0.269
imr_100	Unmatched	8.0234	3.5686	108.5		402.63	0.000
	Matched	8.0234	7.9799	1.1	99.0	2.37	0.018
prec_1000	Unmatched	.26661	.18447	37.5		151.75	0.000
	Matched	.26661	.26452	1.0	97.5	2.21	0.027
landarea_100	Unmatched	27.658	21.497	98.5		285.50	0.000
	Matched	27.658	27.998	-5.4	94.5	-18.96	0.000
spatiallag	Unmatched	.02327	.0046	12.2		72.62	0.000
	Matched	.02327	.01342	6.5	47.2	13.31	0.000

Summary of the distribution of the abs(bias)

BEFORE MATCHING			
Percentiles	Smallest		
1%	.0877281	.0877281	
5%	.0877281	10.69759	
10%	10.69759	11.01458	Obs 11
25%	11.01458	12.23984	Sum of Wgt. 11
50%	36.61249		Mean 46.25109
		Largest	Std. Dev. 40.34778
75%	98.50788	67.29275	
90%	99.827	98.50788	Variance 1627.943
95%	108.5417	99.827	Skewness .497779
99%	108.5417	108.5417	Kurtosis 1.665855

AFTER MATCHING

Percentiles		Smallest		
1%	.4672176	.4672176		
5%	.4672176	.6562858		
10%	.6562858	.9552934	Obs	11
25%	.9552934	1.060143	Sum of Wgt.	11
50%	1.612458		Mean	2.240066
75%	2.565352	Largest	Std. Dev.	1.95517
90%	5.448549	2.309549		
95%	6.457007	2.565352	Variance	3.82269
99%	6.457007	5.448549	Skewness	1.31686
		6.457007	Kurtosis	3.339733

Sample	Pseudo R2	LR chi2	p>chi2	MeanBias	MedBias
Raw	0.231	202356.42	0.000	46.3	36.6
Matched	0.003	945.26	0.000	2.2	1.6

```

227
228
229 keep if _weight==1
    (1429477 observations deleted)
230
231 save matched_conflict_onetoone_FINAL, replace
    file matched_conflict_onetoone_FINAL.dta saved
232 clear
233 use matched_conflict_onetoone_FINAL
234
235
236
237 *****
>
238 ***      Table 4: Matching Models: Rare Events Logit and Negative Binomial      ***
239 *****
240 eststo clear
241 eststo: relogit terror $cv_conf_interaction lagterror lag2terror, cluster(gid)

```

Corrected logit estimates Number of obs = 245376

terror	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
civilconflict	1.058622	.1392	7.61	0.000	.7857949	1.331449
bdist1_100	-.1163557	.0393394	-2.96	0.003	-.1934594	-.039252
civconfXborderdist	-.0311487	.0466793	-0.67	0.505	-.1226384	.060341
capdist_100	-.1198997	.0239485	-5.01	0.000	-.1668379	-.0729614
civconfXcapital	-.0196489	.0259832	-0.76	0.450	-.0705751	.0312772
urban_100	.1516214	.0308831	4.91	0.000	.0910917	.2121511
ipolpop2_1000	.2143406	.0351973	6.09	0.000	.1453551	.283326
log_gcp_ppp90	.4781579	.0733043	6.52	0.000	.3344842	.6218317
excluded	.2901517	.1166306	2.49	0.013	.0615599	.5187435
excluded_squared	-.0380832	.0526207	-0.72	0.469	-.1412178	.0650514
imr_100	-.0043038	.0120231	-0.36	0.720	-.0278687	.019261
prec_1000	.3975508	.1508495	2.64	0.008	.1018913	.6932103
landarea_100	-.0093199	.0066584	-1.40	0.162	-.0223702	.0037304
spatiallag	.541194	.0667714	8.11	0.000	.4103244	.6720635
lagterror	2.437053	.0965047	25.25	0.000	2.247907	2.626199
lag2terror	2.084793	.1064884	19.58	0.000	1.876079	2.293506
_cons	-4.853458	.2364754	-20.52	0.000	-5.316942	-4.389975

(est1 stored)

242 eststo: relogit terror \$cv_conf_interaction_night lagterror lag2terror, cluster(gid
>)
(134491 missing values generated)

Corrected logit estimates

Number of obs = 110885

terror	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
civilconflict	1.548318	.2050599	7.55	0.000	1.146408	1.950228
bdist1_100	-.1670892	.0647982	-2.58	0.010	-.2940913	-.0400871
civconfXborderdist	-.0303989	.07381	-0.41	0.680	-.1750639	.1142661
capdist_100	-.1020093	.0313979	-3.25	0.001	-.1635482	-.0404705
civconfXcapital	-.0852013	.0356309	-2.39	0.017	-.1550366	-.0153659
urban_100	.1295561	.0301999	4.29	0.000	.0703654	.1887469
ipolpop2_1000	.1395311	.0293831	4.75	0.000	.0819413	.197121
log_gcp_ppp90	-.0659815	.1328628	-0.50	0.619	-.3263878	.1944248
excluded	.2463647	.200407	1.23	0.219	-.1464258	.6391553
excluded_squared	-.0525419	.1100126	-0.48	0.633	-.2681625	.1630788
imr_100	.0367562	.0143477	2.56	0.010	.0086353	.0648771
prec_1000	.6912212	.1804258	3.83	0.000	.3375931	1.044849
landarea_100	-.0182014	.0077464	-2.35	0.019	-.0333841	-.0030187
nlights_calib_mean	3.408308	.5845414	5.83	0.000	2.262628	4.553988
spatiallag	.8398822	.1793486	4.68	0.000	.4883653	1.191399
lagterror	2.477649	.1351129	18.34	0.000	2.212833	2.742465
lag2terror	1.592829	.1515038	10.51	0.000	1.295887	1.889771
_cons	-5.188962	.3339268	-15.54	0.000	-5.843447	-4.534478

(est2 stored)

243 eststo: nbreg eventcount \$cv_conf_interaction lageventcount lag2eventcount , cluste
> r(gid) dif

Fitting Poisson model:

```

initial:      log pseudolikelihood = -251380.63
alternative:  log pseudolikelihood = -157420.19
rescale:     log pseudolikelihood = -31198.845
Iteration 0:  log pseudolikelihood = -31198.845
Iteration 1:  log pseudolikelihood = -26722.3      (backed up)
Iteration 2:  log pseudolikelihood = -21071.936
Iteration 3:  log pseudolikelihood = -18282.079
Iteration 4:  log pseudolikelihood = -16128.585
Iteration 5:  log pseudolikelihood = -15981.599
Iteration 6:  log pseudolikelihood = -15974.09
Iteration 7:  log pseudolikelihood = -15974.08
Iteration 8:  log pseudolikelihood = -15974.08
    
```

Fitting constant-only model:

```

Iteration 0:  log pseudolikelihood = -25199.27      (not concave)
Iteration 1:  log pseudolikelihood = -14700.903
Iteration 2:  log pseudolikelihood = -14195.172
Iteration 3:  log pseudolikelihood = -14140.433
Iteration 4:  log pseudolikelihood = -14140.385
Iteration 5:  log pseudolikelihood = -14140.385
    
```

Fitting full model:

```
Iteration 0: log pseudolikelihood = -13796.094 (not concave)
Iteration 1: log pseudolikelihood = -13004.224 (not concave)
Iteration 2: log pseudolikelihood = -12567.483 (not concave)
Iteration 3: log pseudolikelihood = -11287.945
Iteration 4: log pseudolikelihood = -10989.199
Iteration 5: log pseudolikelihood = -10774.738
Iteration 6: log pseudolikelihood = -10749.179
Iteration 7: log pseudolikelihood = -10748.446
Iteration 8: log pseudolikelihood = -10748.444
Iteration 9: log pseudolikelihood = -10748.444
```

```
Negative binomial regression
Dispersion = mean
Log pseudolikelihood = -10748.444
Number of obs = 245376
Wald chi2(16) = 1006.93
Prob > chi2 = 0.0000
```

(Std. Err. adjusted for 24800 clusters in gid)

eventcount	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
civilconflict	1.468441	.2465934	5.95	0.000	.9851271	1.951755
bdist1_100	-.0075202	.0637651	-0.12	0.906	-.1324974	.117457
civconfXborderdist	-.1285397	.0695886	-1.85	0.065	-.2649309	.0078515
capdist_100	-.113052	.0419955	-2.69	0.007	-.1953616	-.0307424
civconfXcapital	-.0502902	.0406402	-1.24	0.216	-.1299436	.0293632
urban_100	.1157598	.0296443	3.90	0.000	.0576579	.1738616
ipolpop2_1000	.4698517	.0613227	7.66	0.000	.3496615	.590042
log_gcp_ppp90	.5087805	.1029106	4.94	0.000	.3070795	.7104815
excluded	.3892432	.1501216	2.59	0.010	.0950102	.6834762
excluded_squared	-.0760626	.0682396	-1.11	0.265	-.2098099	.0576846
imr_100	-.0033387	.0142864	-0.23	0.815	-.0313395	.024662
prec_1000	.4272702	.1993205	2.14	0.032	.0366093	.8179311
landarea_100	-.0095851	.0082475	-1.16	0.245	-.0257499	.0065798
spatiallag	1.397701	.3250313	4.30	0.000	.7606519	2.034751
lageventcount	.8494743	.1586162	5.36	0.000	.5385922	1.160356
lag2eventcount	.5619592	.15441	3.64	0.000	.2593212	.8645972
_cons	-5.087579	.4240011	-12.00	0.000	-5.918606	-4.256552
/lnalpha	2.625359	.1479449			2.335393	2.915326
alpha	13.80954	2.043051			10.33352	18.45483

(est3 stored)

```
244 eststo: nbreg eventcount $cv_conf_interaction_night lageventcount lag2eventcount ,
> cluster(gid) technique(nr bfgs)
```

Fitting Poisson model:

```
(setting technique to nr)
Iteration 0: log pseudolikelihood = -2.81e+295
Iteration 1: log pseudolikelihood = -541946.38 (not concave)
Iteration 2: log pseudolikelihood = -498590.67 (not concave)
Iteration 3: log pseudolikelihood = -490613.22 (not concave)
Iteration 4: log pseudolikelihood = -478053.83 (not concave)
(switching technique to bfgs)
Iteration 5: log pseudolikelihood = -470349.89
BFGS stepping has contracted, resetting BFGS Hessian
Iteration 6: log pseudolikelihood = -470349.89 (backed up)
Iteration 7: log pseudolikelihood = -469594.65 (backed up)
Iteration 8: log pseudolikelihood = -460523.98 (backed up)
Iteration 9: log pseudolikelihood = -449565.58 (backed up)
(switching technique to nr)
Iteration 10: log pseudolikelihood = -333311.52 (not concave)
Iteration 11: log pseudolikelihood = -311860.38 (not concave)
Iteration 12: log pseudolikelihood = -304045.6 (not concave)
Iteration 13: log pseudolikelihood = -293150.89 (not concave)
Iteration 14: log pseudolikelihood = -286945.42 (not concave)
(switching technique to bfgs)
Iteration 15: log pseudolikelihood = -284597.44
Iteration 16: log pseudolikelihood = -282815.7
Iteration 17: log pseudolikelihood = -282590.96
```

```

Iteration 18: log pseudolikelihood = -243838.92
Iteration 19: log pseudolikelihood = -238611.57 (backed up)
(switching technique to nr)
Iteration 20: log pseudolikelihood = -189318.59 (not concave)
Iteration 21: log pseudolikelihood = -181942.09 (not concave)
Iteration 22: log pseudolikelihood = -177431.46 (not concave)
Iteration 23: log pseudolikelihood = -175328.39 (not concave)
Iteration 24: log pseudolikelihood = -165965.28 (not concave)
(switching technique to bfgs)
Iteration 25: log pseudolikelihood = -163993.05
Iteration 26: log pseudolikelihood = -160546.74
Iteration 27: log pseudolikelihood = -151269.57
Iteration 28: log pseudolikelihood = -148249.66
Iteration 29: log pseudolikelihood = -146046.54
(switching technique to nr)
Iteration 30: log pseudolikelihood = -145185.24
Iteration 31: log pseudolikelihood = -142080.61 (backed up)
Iteration 32: log pseudolikelihood = -111554.63 (backed up)
Iteration 33: log pseudolikelihood = -105315.54 (backed up)
Iteration 34: log pseudolikelihood = -98369.306 (backed up)
(switching technique to bfgs)
Iteration 35: log pseudolikelihood = -67364.847 (backed up)
Iteration 36: log pseudolikelihood = -65889.917 (backed up)
Iteration 37: log pseudolikelihood = -65480.212 (backed up)
Iteration 38: log pseudolikelihood = -64345.28 (backed up)
Iteration 39: log pseudolikelihood = -57982.257 (backed up)
(switching technique to nr)
Iteration 40: log pseudolikelihood = -53787.512 (backed up)
Iteration 41: log pseudolikelihood = -17240.58
Iteration 42: log pseudolikelihood = -8792.7975
Iteration 43: log pseudolikelihood = -6223.0952
Iteration 44: log pseudolikelihood = -5993.8234
(switching technique to bfgs)
Iteration 45: log pseudolikelihood = -5876.4323
Iteration 46: log pseudolikelihood = -5862.2253
Iteration 47: log pseudolikelihood = -5859.3537
Iteration 48: log pseudolikelihood = -5859.0816
Iteration 49: log pseudolikelihood = -5859.0698
(switching technique to nr)
Iteration 50: log pseudolikelihood = -5859.0664
Iteration 51: log pseudolikelihood = -5859.0652
Iteration 52: log pseudolikelihood = -5859.0652

```

Fitting constant-only model:

```

(setting technique to nr)
Iteration 0: log pseudolikelihood = -8020.7016 (not concave)
Iteration 1: log pseudolikelihood = -5558.0004
Iteration 2: log pseudolikelihood = -5551.3937
Iteration 3: log pseudolikelihood = -5551.3937

```

Fitting full model:

```

(setting technique to nr)
Iteration 0: log pseudolikelihood = -5304.7419 (not concave)
Iteration 1: log pseudolikelihood = -4697.5293
Iteration 2: log pseudolikelihood = -4295.0392
Iteration 3: log pseudolikelihood = -4270.5162
Iteration 4: log pseudolikelihood = -4268.7779
(switching technique to bfgs)
Iteration 5: log pseudolikelihood = -4268.7722
Iteration 6: log pseudolikelihood = -4268.7722

```

Negative binomial regression		Number of obs	=	110885
Dispersion	= mean	Wald chi2(17)	=	713.92
Log pseudolikelihood	= -4268.7722	Prob > chi2	=	0.0000

(Std. Err. adjusted for 20627 clusters in gid)

eventcount	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
civilconflict	1.810257	.2573131	7.04	0.000	1.305932	2.314581
bdist1_100	.0074989	.0596209	0.13	0.900	-.1093559	.1243536
civconfXborderdist	-.1653106	.0761343	-2.17	0.030	-.314531	-.0160902
capdist_100	-.0651552	.0315753	-2.06	0.039	-.1270417	-.0032687
civconfXcapital	-.0886638	.0352973	-2.51	0.012	-.1578452	-.0194825
urban_100	.1026263	.0248314	4.13	0.000	.0539577	.1512949
ipolpop2_1000	.2849148	.0573472	4.97	0.000	.1725163	.3973134
log_gcp_ppp90	-.2882752	.1763422	-1.63	0.102	-.6338995	.0573492
excluded	.3153426	.2421185	1.30	0.193	-.159201	.7898862
excluded_squared	-.0971259	.135964	-0.71	0.475	-.3636104	.1693586
imr_100	.0491226	.0158151	3.11	0.002	.0181255	.0801197
prec_1000	.8361701	.2350045	3.56	0.000	.3755698	1.29677
landarea_100	-.0156232	.0107219	-1.46	0.145	-.0366377	.0053914
nlights_calib_mean	4.932788	.8518099	5.79	0.000	3.263271	6.602305
spatiallag	4.078201	.6104764	6.68	0.000	2.881689	5.274712
lageventcount	1.059657	.1880135	5.64	0.000	.6911577	1.428157
lag2eventcount	.6783145	.144172	4.70	0.000	.3957425	.9608865
_cons	-5.963349	.4419161	-13.49	0.000	-6.829488	-5.097209
/lnalpha	2.719186	.1381007			2.448514	2.989858
alpha	15.16797	2.094708			11.57113	19.88287

(est4 stored)

```
245 esttab using MatchedRelogitNBREG_unf.tex, title(Matching Models: Rare Events Logit a
> nd Negative Binomial) se pr2 replace nonumbers label booktabs mtitles("Rare Events
> Logit" "Negative Binomial" ) compress
(output written to MatchedRelogitNBREG_unf.tex)
```

```
246
247
248
249 *switch back to full dataset
250 clear
```

```
251 use Geog_Terror_Data_FINAL
```

```
252 tsset gid year
    panel variable: gid (strongly balanced)
    time variable: year, 1968 to 2013
    delta: 1 unit
```

```
253
254 *****
>
255 *** Table 5: Multilevel Negative Binomial Models without nighttime lights ***
256 *****
257 eststo clear
```

```
258 #delimit ;
delimitter now ;
259 eststo: menbreg eventcount $cv_conf_interaction lageventcount lag2eventcount
> van_index gd_ptsa c.beaur_capacity##c.capdist_100 c.Milit_capacity##c.capdist_100
> ||gwno:, intm(mc) technique(dfp bhhh nr bfgs);
```

Fitting fixed-effects model:

```
Iteration 0: log likelihood = -18592.166 (not concave)
Iteration 1: log likelihood = -15072.786 (not concave)
Iteration 2: log likelihood = -13166.596
Iteration 3: log likelihood = -12690.242
Iteration 4: log likelihood = -12544.151
Iteration 5: log likelihood = -12533.499
Iteration 6: log likelihood = -12533.334
Iteration 7: log likelihood = -12533.334
```

Refining starting values:

Grid node 0: log likelihood = -12288.668

Fitting full model:

```
(setting technique to dfp)
Iteration 0: log likelihood = -12288.668
Iteration 1: log likelihood = -12271.885 (backed up)
Iteration 2: log likelihood = -12266.025 (backed up)
Iteration 3: log likelihood = -12247.407 (backed up)
Iteration 4: log likelihood = -12242.923 (backed up)
(switching technique to bhhh)
Iteration 5: log likelihood = -12237.85 (backed up)
Iteration 6: log likelihood = -12226.998
Iteration 7: log likelihood = -12211.29
Iteration 8: log likelihood = -12205.122
Iteration 9: log likelihood = -12196.863
(switching technique to nr)
Iteration 10: log likelihood = -12193.608
Iteration 11: log likelihood = -12162.496
Iteration 12: log likelihood = -12158.876
Iteration 13: log likelihood = -12158.847
Iteration 14: log likelihood = -12158.847
```

```
Mixed-effects nbinoimial regression      Number of obs      =      837621
Overdispersion:                          mean
Group variable:                          gwno              Number of groups   =          94

                                           Obs per group: min =          30
                                           avg =             8910.9
                                           max =            128670

Integration method: mcaghermite           Integration points =          7

                                           Wald chi2(22)      =      2478.11
                                           Prob > chi2        =      0.0000
```

Log likelihood = -12158.847

	eventcount	Coef.	Std. Err.	z	P> z	[95% Conf.]
> Interval]						
> 1.213155	civilconflict	.9230861	.1479969	6.24	0.000	.6330175
> .0604196	bdist1_100	.0337018	.0136318	2.47	0.013	.0069841
> -.0165732	civconfXborderdist	-.0797585	.032238	-2.47	0.013	-.1429437
> .0337958	capdist_100	.0073852	.013475	0.55	0.584	-.0190253
> .0517318	civconfXcapital	.0160355	.0182128	0.88	0.379	-.0196608
> .1813951	urban_100	.1546706	.0136352	11.34	0.000	.1279461
> .6956804	ipolpop2_1000	.6210688	.0380679	16.31	0.000	.5464571
> .7683888	log_gcp_ppp90	.6717808	.0492907	13.63	0.000	.5751728
> .3583276	excluded	.1862375	.0878027	2.12	0.034	.0141473
> .1303011	excluded_squared	.0588224	.0364694	1.61	0.107	-.0126564
> .0166994	imr_100	-.025411	.0214853	-1.18	0.237	-.0675215
> 1.304647	prec_1000	.9602196	.1757316	5.46	0.000	.615792
> -.0040753	landarea_100	-.0126079	.0043535	-2.90	0.004	-.0211406
> 1.982701	spatiallag	1.673206	.1579084	10.60	0.000	1.363711
	lageventcount	1.184093	.0711901	16.63	0.000	1.044563

>	1.323623							
		lag2eventcount		.8839083	.0665768	13.28	0.000	.7534202
>	1.014396							
		van_index		-.0062715	.0054699	-1.15	0.252	-.0169924
>	.0044494							
		gd_ptsa		.1587632	.0417121	3.81	0.000	.0770089
>	.2405174							
		beaur_capacity		-.1586085	.0870512	-1.82	0.068	-.3292256
>	.0120087							
		c.beaur_capacity#c.capdist_100		.0036549	.0077925	0.47	0.639	-.0116181
>	.0189278							
		Milit_capacity		-.7275866	.1066245	-6.82	0.000	-.9365668
>	-.5186064							
		c.Milit_capacity#c.capdist_100		-.0070056	.0075226	-0.93	0.352	-.0217496
>	.0077385							
		_cons		-6.054076	.2600251	-23.28	0.000	-6.563715
>	-5.544436							
		/lnalpha		2.634135	.045321	58.12	0.000	2.545308
>	2.722963							
gwno		var(_cons)		1.25345	.2495045			.8485393
>	1.851579							

LR test vs. nbinoimial regression: $\text{chibar2}(01) = 748.98$ Prob>=chibar2 = 0.0000
(est1 stored)

```

260 #delimit cr
    delimiter now cr
261
262 #delimit ;
    delimiter now ;
263 eststo: menbreg eventcount $cv_conf_interaction lageventcount lag2eventcount
> fh_ipolity2 gd_ptsa c.beaur_capacity##c.capdist_100 c.Milit_capacity##c.capdist_100
>
> ||gwno:, intm(mc) technique(dfp bhhh bfgs nr);

```

Fitting fixed-effects model:

```

Iteration 0: log likelihood = -18579.767 (not concave)
Iteration 1: log likelihood = -15193.398 (not concave)
Iteration 2: log likelihood = -13349.177
Iteration 3: log likelihood = -12743.242
Iteration 4: log likelihood = -12561.716
Iteration 5: log likelihood = -12547.85
Iteration 6: log likelihood = -12547.695
Iteration 7: log likelihood = -12547.695

```

Refining starting values:

```

Grid node 0: log likelihood = -12301.554

```

Fitting full model:

```
(setting technique to dfp)
Iteration 0: log likelihood = -12301.554
Iteration 1: log likelihood = -12293.154 (backed up)
Iteration 2: log likelihood = -12273.519 (backed up)
Iteration 3: log likelihood = -12269.597 (backed up)
Iteration 4: log likelihood = -12266.19 (backed up)
(switching technique to bhhh)
Iteration 5: log likelihood = -12259.256 (backed up)
Iteration 6: log likelihood = -12247.096
Iteration 7: log likelihood = -12226.17
Iteration 8: log likelihood = -12220.722
Iteration 9: log likelihood = -12209.486
(switching technique to bfgs)
Iteration 10: log likelihood = -12205.79
Iteration 11: log likelihood = -12199.653
Iteration 12: log likelihood = -12189.626
Iteration 13: log likelihood = -12183.311
Iteration 14: log likelihood = -12179.986
(switching technique to nr)
Iteration 15: log likelihood = -12178.106
Iteration 16: log likelihood = -12172.922
Iteration 17: log likelihood = -12172.905
Iteration 18: log likelihood = -12172.905
```

```
Mixed-effects nbinoimial regression      Number of obs      =      837626
Overdispersion:                          mean
Group variable:                          gwno              Number of groups   =          94
                                           Obs per group: min =          30
                                           avg =       8910.9
                                           max =     128670

Integration method: mcaghermite          Integration points  =          7

Wald chi2(22)                            =     2475.31
Prob > chi2                              =          0.0000

Log likelihood = -12172.905
```

	eventcount	Coef.	Std. Err.	z	P> z	[95% Conf.]
> Interval]						
> 1.209022	civilconflict	.9187083	.1481218	6.20	0.000	.628395
> .0607947	bdist1_100	.0341119	.0136139	2.51	0.012	.0074291
> -.0168827	civconfXborderdist	-.0800093	.032208	-2.48	0.013	-.1431359
> .0339001	capdist_100	.0075133	.0134629	0.56	0.577	-.0188734
> .0522296	civconfXcapital	.0165101	.0182246	0.91	0.365	-.0192094
> .1810957	urban_100	.1543952	.013623	11.33	0.000	.1276947
> .6976863	ipolpop2_1000	.6229937	.0381092	16.35	0.000	.548301
> .7679763	log_gcp_ppp90	.671376	.0492868	13.62	0.000	.5747757
> .3596054	excluded	.1875077	.0878066	2.14	0.033	.01541
> .1300517	excluded_squared	.0586344	.036438	1.61	0.108	-.0127828
> .0180317	imr_100	-.0238977	.0213929	-1.12	0.264	-.065827
> 1.300029	prec_1000	.9555272	.1757694	5.44	0.000	.6110254
> -.0040045	landarea_100	-.0125379	.0043538	-2.88	0.004	-.0210713
> 1.983145	spatiallag	1.673525	.1579721	10.59	0.000	1.363906
> 1.31688	lageventcount	1.177463	.0711323	16.55	0.000	1.038046

>	1.006851	lag2eventcount	.8767479	.0663804	13.21	0.000	.7466447
>	.0301389	fh_ipolity2	-.0081768	.0195492	-0.42	0.676	-.0464924
>	.2410254	gd_ptsa	.1586634	.0420222	3.78	0.000	.0763013
>	-.0036087	beaur_capacity	-.1718379	.0858328	-2.00	0.045	-.3400671
>	.0193375	c.beaur_capacity#c.capdist_100	.0040747	.0077873	0.52	0.601	-.0111882
>	-.5374467	Milit_capacity	-.7441473	.1054615	-7.06	0.000	-.950848
>	.0074485	c.Milit_capacity#c.capdist_100	-.0072734	.0075113	-0.97	0.333	-.0219953
>	-5.551154	_cons	-6.097068	.278533	-21.89	0.000	-6.642983
>	2.726693	/lnalpha	2.638032	.0452361	58.32	0.000	2.549371
>	1.821562	gwno var(_cons)	1.235435	.2447412			.8379073

LR test vs. nbinoomial regression: $\text{chibar2}(01) = 749.58$ Prob>=chibar2 = 0.0000
(est2 stored)

```

264 #delimit cr
    delimiter now cr
265
266 #delimit ;
    delimiter now ;
267 eststo: menbreg eventcount $cv_conf_interaction lageventcount lag2eventcount
> p_polity gd_ptsa c.beaur_capacity##c.capdist_100 c.Milit_capacity##c.capdist_100
> |gwno:, intm(mc) technique(dfp bhhh bfgs nr);

```

Fitting fixed-effects model:

```

Iteration 0: log likelihood = -17715.264 (not concave)
Iteration 1: log likelihood = -14502.131 (not concave)
Iteration 2: log likelihood = -12770.124
Iteration 3: log likelihood = -12495.942 (not concave)
Iteration 4: log likelihood = -12001.221
Iteration 5: log likelihood = -11842.759
Iteration 6: log likelihood = -11840.807
Iteration 7: log likelihood = -11840.797
Iteration 8: log likelihood = -11840.797

```

Refining starting values:

```

Grid node 0: log likelihood = -11606.152

```

Fitting full model:

```
(setting technique to dfp)
Iteration 0: log likelihood = -11606.152
Iteration 1: log likelihood = -11597.487 (backed up)
Iteration 2: log likelihood = -11574.387 (backed up)
Iteration 3: log likelihood = -11564.933 (backed up)
Iteration 4: log likelihood = -11559.246 (backed up)
(switching technique to bhgh)
Iteration 5: log likelihood = -11551.72 (backed up)
Iteration 6: log likelihood = -11529.532
Iteration 7: log likelihood = -11515.787
Iteration 8: log likelihood = -11512.559
Iteration 9: log likelihood = -11509.609
(switching technique to bfgs)
Iteration 10: log likelihood = -11508.502
Iteration 11: log likelihood = -11499.405
Iteration 12: log likelihood = -11496.121
Iteration 13: log likelihood = -11493.037
Iteration 14: log likelihood = -11492.115
(switching technique to nr)
Iteration 15: log likelihood = -11490.855
Iteration 16: log likelihood = -11485.505
Iteration 17: log likelihood = -11485.482
Iteration 18: log likelihood = -11485.482
```

```
Mixed-effects nbinoimial regression      Number of obs      =      807580
Overdispersion:                          mean
Group variable:                          gwno              Number of groups   =           90
                                           Obs per group: min =           10
                                           avg =          8973.1
                                           max =         128670

Integration method: mcaghermite          Integration points =           7

Wald chi2(22)                            =      2415.27
Prob > chi2                               =           0.0000

Log likelihood = -11485.482
```

	eventcount	Coef.	Std. Err.	z	P> z	[95% Conf.
> Interval]						
> 1.106363	civilconflict	.8036387	.1544538	5.20	0.000	.5009149
> .0644465	bdist1_100	.0377463	.0136228	2.77	0.006	.011046
> -.0219362	civconfXborderdist	-.0864027	.0328917	-2.63	0.009	-.1508693
> .0358933	capdist_100	.0084714	.013991	0.61	0.545	-.0189505
> .0684765	civconfXcapital	.0308924	.0191759	1.61	0.107	-.0066918
> .1688152	urban_100	.1420935	.0136338	10.42	0.000	.1153718
> .6637235	ipolpop2_1000	.5907812	.0372162	15.87	0.000	.5178389
> .801396	log_gcp_ppp90	.704878	.0492447	14.31	0.000	.6083601
> .4133128	excluded	.238546	.0891684	2.68	0.007	.0637791
> .1270676	excluded_squared	.0556947	.0364154	1.53	0.126	-.0156782
> .0165071	imr_100	-.0275886	.0224982	-1.23	0.220	-.0716843
> 1.306778	prec_1000	.9606033	.176623	5.44	0.000	.6144287
> -.0039863	landarea_100	-.0126471	.0044189	-2.86	0.004	-.0213079
> 1.937507	spatiallag	1.625997	.1589363	10.23	0.000	1.314488
> 1.314833	lageventcount	1.173989	.0718608	16.34	0.000	1.033144

>	1.042181	lag2eventcount	.90784	.0685426	13.24	0.000	.773499
>	.0121099	p_polity	-.0044247	.0084362	-0.52	0.600	-.0209594
>	.2562951	gd_ptsa	.1703844	.0438328	3.89	0.000	.0844736
>	-.022798	beaur_capacity	-.1974502	.0891099	-2.22	0.027	-.3721024
	c.beaur_capacity#c.capdist_100		.0100589	.0081413	1.24	0.217	-.0058977
>	.0260156						
>	-.4956742	Milit_capacity	-.7081197	.1083925	-6.53	0.000	-.9205651
	c.Milit_capacity#c.capdist_100		-.0107354	.0078302	-1.37	0.170	-.0260824
>	.0046116						
>	-5.750966	_cons	-6.248739	.2539705	-24.60	0.000	-6.746512
<hr/>							
>	2.718322	/lnalpha	2.627104	.0465407	56.45	0.000	2.535886
<hr/>							
	gwno	var(_cons)	1.216951	.2510394			.8122365
>	1.823323						

LR test vs. nbinoomial regression: $\text{chibar2}(01) = 710.63$ Prob>=chibar2 = 0.0000
(est3 stored)

```

268 #delimit cr
    delimiter now cr
269
270 esttab using MultilevelModelsCapacity_unf.tex, title(Multilevel Negative Binomial Mo
> dels) se pr2 replace nonumbers label booktabs mtitles("Multilevel Negative Binomial
> " "Multilevel Negative Binomial" "Multilevel Negative Binomial") compress
(output written to MultilevelModelsCapacity_unf.tex)

271
272
273 *****
>
274 ***      Table 6: Multilevel Negative Binomial Models with nighttime lights      ***
275 *****
276 eststo clear

277 #delimit ;
    delimiter now ;
278 eststo: menbreg eventcount $cv_conf_interaction_night lageventcount lag2eventcount
> van_index gd_ptsa c.beaur_capacity##c.capdist_100 c.Milit_capacity##c.capdist_100
> ||gwno:, dif;

Fitting fixed-effects model:

Iteration 0:  log likelihood = -10094.025 (not concave)
Iteration 1:  log likelihood = -7014.2063
Iteration 2:  log likelihood = -6710.0652
Iteration 3:  log likelihood = -6527.3977
Iteration 4:  log likelihood = -6255.2721
Iteration 5:  log likelihood = -6192.7396
Iteration 6:  log likelihood = -6187.3032
Iteration 7:  log likelihood = -6187.251
Iteration 8:  log likelihood = -6187.251

Refining starting values:

Grid node 0:  log likelihood = -6085.0055

```

Fitting full model:

Iteration 0: log likelihood = -6085.0055
 Iteration 1: log likelihood = -6050.9439
 Iteration 2: log likelihood = -6024.0283
 Iteration 3: log likelihood = -6023.6128
 Iteration 4: log likelihood = -6023.6125

Mixed-effects nbinomial regression
 Overdispersion: mean
 Group variable: gwno

Number of obs = 589477
 Number of groups = 93
 Obs per group: min = 30
 avg = 6338.5
 max = 123149

Integration method: mvaghermite

Integration points = 7

Log likelihood = -6023.6125

Wald chi2(23) = 1541.99
 Prob > chi2 = 0.0000

	eventcount	Coef.	Std. Err.	z	P> z	[95% Conf.
> Interval]						
> 1.156127	civilconflict	.7509156	.2067444	3.63	0.000	.345704
> .084824	bdist1_100	.0475704	.0190072	2.50	0.012	.0103169
> .044197	civconfXborderdist	-.0349614	.0403877	-0.87	0.387	-.1141198
> .0636768	capdist_100	.026756	.0188375	1.42	0.156	-.0101649
> .0745674	civconfXcapital	.027242	.0241461	1.13	0.259	-.0200835
> .1748884	urban_100	.1395068	.0180522	7.73	0.000	.1041252
> .3888945	ipolpop2_1000	.3015173	.044581	6.76	0.000	.2141402
> .3080802	log_gcp_ppp90	.1300551	.0908308	1.43	0.152	-.04797
> .457495	excluded	.2307397	.1156936	1.99	0.046	.0039843
> .1311707	excluded_squared	.0463651	.0432689	1.07	0.284	-.0384404
> .0786477	imr_100	.0264102	.0266522	0.99	0.322	-.0258272
> 1.448417	prec_1000	.9900578	.2338612	4.23	0.000	.5316983
> -.0066061	landarea_100	-.0187592	.0062007	-3.03	0.002	-.0309123
> 6.344167	nlights_calib_mean	5.448661	.4568992	11.93	0.000	4.553155
> 3.329188	spatiallag	2.756322	.2922838	9.43	0.000	2.183457
> 1.392164	lageventcount	1.183451	.1064884	11.11	0.000	.9747375
> .8135185	lag2eventcount	.627372	.0949744	6.61	0.000	.4412256
> .0114258	van_index	-.0050747	.0084188	-0.60	0.547	-.0215752
> .3803304	gd_ptsa	.2549568	.0639673	3.99	0.000	.1295833
> .730501	beaur_capacity	.4440455	.1461535	3.04	0.002	.15759
> .0346368	c.beaur_capacity#c.capdist_100	.0135277	.0107702	1.26	0.209	-.0075815
> -.6716638	Milit_capacity	-.96647	.1504141	-6.43	0.000	-1.261276

c.Milit_capacity#c.capdist_100		-0.0169661	.0101826	-1.67	0.096	-.0369236
> .0029913						
	_cons	-6.969859	.3660088	-19.04	0.000	-7.687223
> -6.252495						
	/lnalpha	2.652088	.0696914	38.05	0.000	2.515495
> 2.78868						
gwno	var(_cons)	1.250813	.2746806			.8133308
> 1.923613						

LR test vs. nbinoomial regression: chibar2(01) = 327.28 Prob>=chibar2 = 0.0000
(est1 stored)

```
279 #delimit cr
delimitter now cr
280
281 #delimit ;
delimitter now ;
282 eststo: menbreg eventcount $cv_conf_interaction_night lageventcount lag2eventcount
> fh_ipolity2 gd_ptsa c.beaur_capacity##c.capdist_100 c.Milit_capacity##c.capdist_100
>
> ||gwno:, dif;
```

Fitting fixed-effects model:

```
Iteration 0: log likelihood = -10079.482 (not concave)
Iteration 1: log likelihood = -7012.8385
Iteration 2: log likelihood = -6681.6283
Iteration 3: log likelihood = -6455.58
Iteration 4: log likelihood = -6248.8541
Iteration 5: log likelihood = -6194.4114
Iteration 6: log likelihood = -6188.1977
Iteration 7: log likelihood = -6188.1287
Iteration 8: log likelihood = -6188.1286
```

Refining starting values:

Grid node 0: log likelihood = -6082.281

Fitting full model:

```
Iteration 0: log likelihood = -6082.281
Iteration 1: log likelihood = -6049.4682
Iteration 2: log likelihood = -6021.384
Iteration 3: log likelihood = -6020.9602
Iteration 4: log likelihood = -6020.9599
```

Mixed-effects nbinoomial regression
Overdispersion: mean
Group variable: gwno

```
Number of obs = 589477
Number of groups = 93
Obs per group: min = 30
                avg = 6338.5
                max = 123149
```

Integration method: mvaghermite

Integration points = 7

Log likelihood = **-6020.9599** Wald chi2(23) = **1539.40**
 Prob > chi2 = **0.0000**

	eventcount	Coef.	Std. Err.	z	P> z	[95% Conf.]
>	Interval]					
>	civilconflict	.7169381	.2070033	3.46	0.001	.311219
>	1.122657					
>	bdist1_100	.0472793	.0190098	2.49	0.013	.0100208
>	.0845378					
>	civconfXborderdist	-.03528	.0402854	-0.88	0.381	-.1142379
>	.0436779					
>	capdist_100	.0250373	.0188488	1.33	0.184	-.0119058
>	.0619803					
>	civconfXcapital	.030109	.0241738	1.25	0.213	-.0172709
>	.0774889					
>	urban_100	.138479	.0180102	7.69	0.000	.1031797
>	.1737782					
>	ipolpop2_1000	.3002994	.0445742	6.74	0.000	.2129355
>	.3876633					
>	log_gcp_ppp90	.1333384	.0908033	1.47	0.142	-.0446328
>	.3113096					
>	excluded	.2247766	.1158655	1.94	0.052	-.0023157
>	.4518688					
>	excluded_squared	.0460695	.043459	1.06	0.289	-.0391085
>	.1312475					
>	imr_100	.0210886	.0265537	0.79	0.427	-.0309557
>	.073133					
>	prec_1000	1.023659	.2333208	4.39	0.000	.5663589
>	1.48096					
>	landarea_100	-.0188681	.0061974	-3.04	0.002	-.0310147
>	-.0067215					
>	nights_calib_mean	5.452318	.4568813	11.93	0.000	4.556847
>	6.347789					
>	spatiallag	2.789225	.2932899	9.51	0.000	2.214387
>	3.364062					
>	lageventcount	1.176608	.1065203	11.05	0.000	.9678319
>	1.385384					
>	lag2eventcount	.6302304	.0952	6.62	0.000	.4436418
>	.816819					
>	fh_ipolity2	-.0721211	.0301224	-2.39	0.017	-.1311599
>	-.0130822					
>	gd_ptsa	.2311774	.0641426	3.60	0.000	.1054601
>	.3568946					
>	beaur_capacity	.4602729	.1449749	3.17	0.001	.1761274
>	.7444185					
>	c.beaur_capacity#c.capdist_100	.0133737	.0107537	1.24	0.214	-.0077031
>	.0344504					
>	Milit_capacity	-.9763385	.1479594	-6.60	0.000	-1.266334
>	-.6863433					
>	c.Milit_capacity#c.capdist_100	-.0161682	.0101898	-1.59	0.113	-.0361399
>	.0038035					
>	_cons	-6.516513	.3930649	-16.58	0.000	-7.286905
>	-5.74612					
>	/lnalpha	2.655348	.0696841	38.11	0.000	2.51877
>	2.791927					
gwno	var(_cons)	1.206463	.2667718			.7821628
>	1.860933					

LR test vs. nbinomial regression: chibar2(01) = 334.34 Prob>=chibar2 = 0.0000

(est2 stored)

```
283 #delimit cr
    delimiter now cr
284
285 #delimit ;
    delimiter now ;
286 eststo: menbreg eventcount $cv_conf_interaction_night lageventcount lag2eventcount
> p_polity gd_ptsa c.beaur_capacity##c.capdist_100 c.Milit_capacity##c.capdist_100
> | gwno:, dif;
```

Fitting fixed-effects model:

```
Iteration 0: log likelihood = -9629.7366 (not concave)
Iteration 1: log likelihood = -6513.6274
Iteration 2: log likelihood = -6074.5769
Iteration 3: log likelihood = -5807.3279
Iteration 4: log likelihood = -5762.2989
Iteration 5: log likelihood = -5760.2452
Iteration 6: log likelihood = -5760.2416
Iteration 7: log likelihood = -5760.2416
```

Refining starting values:

```
Grid node 0: log likelihood = -5664.7501
```

Fitting full model:

```
Iteration 0: log likelihood = -5664.7501
Iteration 1: log likelihood = -5634.5163
Iteration 2: log likelihood = -5610.1385
Iteration 3: log likelihood = -5609.3733
Iteration 4: log likelihood = -5609.3545
Iteration 5: log likelihood = -5609.3544
```

```
Mixed-effects nbinoomial regression          Number of obs      =    570158
Overdispersion:          mean
Group variable:          gwno                Number of groups   =         90
                                                Obs per group: min =         10
                                                avg =        6335.1
                                                max =       123149
```

```
Integration method: mvaghermite              Integration points =         7
```

```
Log likelihood = -5609.3544                  Wald chi2(23)      =    1488.91
                                                Prob > chi2       =     0.0000
```

	eventcount	Coef.	Std. Err.	z	P> z	[95% Conf.
> Interval]						
> 1.108586	civilconflict	.6838461	.2167079	3.16	0.002	.2591064
> .0900584	bdist1_100	.053024	.0188955	2.81	0.005	.0159895
> .0238289	civconfXborderdist	-.0585808	.0420466	-1.39	0.164	-.1409906
> .046145	capdist_100	.0071158	.0199132	0.36	0.721	-.0319133
> .0977174	civconfXcapital	.0461329	.0263191	1.75	0.080	-.0054517
> .1541905	urban_100	.1192292	.0178377	6.68	0.000	.0842679
> .3713721	ipolpop2_1000	.284387	.0443809	6.41	0.000	.197402
> .3069999	log_gcp_ppp90	.1263232	.0921837	1.37	0.171	-.0543535
> .489106	excluded	.2567161	.1185685	2.17	0.030	.0243261
	excluded_squared	.0484412	.043426	1.12	0.265	-.0366722

>	.1335546							
		imr_100		.0232877	.0272569	0.85	0.393	-.030135
>	.0767103							
		prec_1000		.9624615	.2378689	4.05	0.000	.4962471
>	1.428676							
		landarea_100		-.019964	.006401	-3.12	0.002	-.0325098
>	-.0074182							
		nights_calib_mean		5.602405	.4658479	12.03	0.000	4.68936
>	6.51545							
		spatiallag		2.839624	.3048512	9.31	0.000	2.242127
>	3.437122							
		lageventcount		1.251593	.1107357	11.30	0.000	1.034555
>	1.468631							
		lag2eventcount		.6750473	.1030785	6.55	0.000	.4730172
>	.8770775							
		p_polity		-.0233838	.0129784	-1.80	0.072	-.048821
>	.0020534							
		gd_ptsa		.2320262	.066135	3.51	0.000	.1024041
>	.3616484							
		beaur_capacity		.4657377	.1522013	3.06	0.002	.1674287
>	.7640467							
		c.beaur_capacity#c.capdist_100		.0203337	.0112816	1.80	0.071	-.0017779
>	.0424452							
		Milit_capacity		-.9940256	.1516419	-6.56	0.000	-1.291238
>	-.696813							
		c.Milit_capacity#c.capdist_100		-.0112419	.0106532	-1.06	0.291	-.0321217
>	.0096379							
		_cons		-6.84268	.3316326	-20.63	0.000	-7.492668
>	-6.192692							
<hr/>								
		/lnalpha		2.686939	.071177	37.75	0.000	2.547435
>	2.826443							
<hr/>								
	gwno							
		var(_cons)		1.159969	.2625264			.7443905
>	1.807557							

LR test vs. nbinomial regression: $\text{chibar2}(01) = 301.77$ Prob>=chibar2 = 0.0000
(est3 stored)

287 #delimit cr
delimitter now cr

288

289 esttab using MultilevelModelsCapacity_Night_unf.tex, title(Multilevel Negative Binomial Models) se pr2 replace nonumbers label booktabs mtitles("Multilevel Negative Binomial" "Multilevel Negative Binomial" "Multilevel Negative Binomial") compress
(output written to MultilevelModelsCapacity_Night_unf.tex)

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