Supplementary Appendix

1. Models including Presbyterian and Congregationalist Churches (1831) and time-varying number of Presbyterian clergy per 10,000 population.

2. Models for anti-slavery growth refitted to estimate random variation in time.

3. Model 4 for temperance growth refitted to estimate random variation in time^2

4. Model 4 for temperance growth refitted using conditional fixed effects.
    a. Model 4
    b. Model 4 extended to include time-varying indicators

5. General Estimating Equations (GEE) used with unstructured autocorrelation within-counties across time.

1. Temperance Counts: Churches + Clergy

```
Mixed-effects Poisson regression                Number of obs     =        275
Group variable: id                              Number of groups  =         55

                                                Obs per group:
                                                              min =          5
                                                              avg =        5.0
                                                              max =          5

Integration points =   7                        Wald chi2(21)     =     635.97
Log likelihood = -845.80699                     Prob > chi2       =     0.0000
```

temp	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ntime	.4707037	.0431155	10.92	0.000	.3861989	.5552086
ntime2	-.0307828	.0050969	-6.04	0.000	-.0407725	-.0207932
ntime3	.0008006	.0001822	4.39	0.000	.0004436	.0011577
cgrowth	-.0568316	.0232356	-2.45	0.014	-.1023726	-.0112906
urban	-.1977269	.1701983	-1.16	0.245	-.5313095	.1358556
ctowns	-.0022462	.0095152	-0.24	0.813	-.0208956	.0164032
csexr	.0032642	.0158422	0.21	0.837	-.0277859	.0343143
cpaper	-.07805	.107977	-0.72	0.470	-.289681	.1335809
nofact	.3402917	.1206383	2.82	0.005	.1038451	.5767384
new_area						
2	.0170616	.1570246	0.11	0.913	-.2907009	.3248242
3	-.0495472	.1781525	-0.28	0.781	-.3987197	.2996253
4	-.1757589	.2275682	-0.77	0.440	-.6217843	.2702665
5	.3091586	.236312	1.31	0.191	-.1540045	.7723217
6	-.1965494	.3216838	-0.61	0.541	-.8270381	.4339392
ctextiles25	.0035661	.0027018	1.32	0.187	-.0017293	.0088615
ctextilechg	-.0023126	.003696	-0.63	0.532	-.0095566	.0049314
cvote25	-.0180257	.0247856	-0.73	0.467	-.0666047	.0305532
cvotechg	-.0153753	.0137833	-1.12	0.265	-.04239	.0116395
cpost	-.0020246	.025502	-0.08	0.937	-.0520076	.0479583
cchurch	**-.0105812**	**.111501**	**-0.09**	**0.924**	**-.2291191**	**.2079566**
cpres	**.0296065**	**.0300832**	**0.98**	**0.325**	**-.0293555**	**.0885684**
_cons	-10.1518	.2072892	-48.97	0.000	-10.55808	-9.745525
lnpop	1	(offset)				

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
id: Unstructured				
var(ntime)	.0012963	.0004187	.0006883	.0024416
var(_cons)	.2578041	.0849142	.1351841	.4916479
cov(ntime,_cons)	-.0160906	.0056762	-.0272157	-.0049655

```
LR test vs. Poisson model: chi2(3) = 196.01                   Prob > chi2 = 0.0000
```

Temperance Counts: Churches + Clergy + Revivals

```
Mixed-effects Poisson regression                Number of obs     =        275
Group variable: id                              Number of groups  =         55

                                                Obs per group:
                                                              min =          5
                                                              avg =        5.0
                                                              max =          5

Integration points =   7                        Wald chi2(22)     =     676.42
Log likelihood = -838.00046                     Prob > chi2       =     0.0000
```

temp	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ntime	.4248561	.0436402	9.74	0.000	.3393229	.5103893
ntime2	-.0292221	.0050416	-5.80	0.000	-.0391034	-.0193409
ntime3	.0008028	.0001806	4.45	0.000	.0004489	.0011567
cgrowth	-.0298447	.0233639	-1.28	0.201	-.075637	.0159476
urban	-.2922626	.1580733	-1.85	0.064	-.6020806	.0175554
ctowns	-.0112472	.0090275	-1.25	0.213	-.0289407	.0064463
csexr	-.0143951	.0160603	-0.90	0.370	-.0458727	.0170824
cpaper	-.0343417	.1000341	-0.34	0.731	-.2304049	.1617215
nofact	.3044327	.1114945	2.73	0.006	.0859074	.5229579
new_area						
2	-.1318528	.1480999	-0.89	0.373	-.4221233	.1584177
3	-.2745962	.1741992	-1.58	0.115	-.6160204	.066828
4	-.2456697	.2122906	-1.16	0.247	-.6617517	.1704124
5	.0908408	.2247934	0.40	0.686	-.3497462	.5314278
6	-.4695759	.3072738	-1.53	0.126	-1.071821	.1326697
ctextiles25	.0024141	.0025052	0.96	0.335	-.002496	.0073243
ctextilechg	-.0009764	.0034268	-0.28	0.776	-.0076928	.0057401
cvote25	-.0221707	.022875	-0.97	0.332	-.0670049	.0226634
cvotechg	-.0102106	.0127962	-0.80	0.425	-.0352908	.0148695
cpost	.0176966	.0239665	0.74	0.460	-.0292768	.06467
cchurch	-.1489431	.1081537	-1.38	0.168	-.3609204	.0630343
cpres	.0190001	.0288272	0.66	0.510	-.0375002	.0755005
clnrev	**.3409786**	**.084471**	**4.04**	**0.000**	**.1754186**	**.5065387**
_cons	-9.746322	.2189148	-44.52	0.000	-10.17539	-9.317257
lnpop	1	(offset)				

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
id: Unstructured				
var(ntime)	.0012607	.0004101	.0006664	.002385
var(_cons)	.2402347	.0822704	.122782	.4700423
cov(ntime,_cons)	-.0156589	.0055634	-.0265629	-.004755

```
LR test vs. Poisson model: chi2(3) = 155.36              Prob > chi2 = 0.0000
```

Temperance Counts: Churches + Clergy + Revivals + Home Missionary Societies

```
Mixed-effects Poisson regression                Number of obs     =        275
Group variable: id                              Number of groups  =         55

                                                Obs per group:
                                                              min =          5
                                                              avg =        5.0
                                                              max =          5

Integration points =   7                        Wald chi2(24)     =     757.06
Log likelihood = -833.37135                     Prob > chi2       =     0.0000
```

temp	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ntime	.4119661	.043532	9.46	0.000	.3266448	.4972873
ntime2	-.027997	.0050419	-5.55	0.000	-.0378789	-.0181151
ntime3	.0007716	.0001805	4.27	0.000	.0004178	.0011254
cgrowth	-.0163592	.0238927	-0.68	0.494	-.0631879	.0304696
urban	-.3635091	.1593985	-2.28	0.023	-.6759245	-.0510938
ctowns	-.009464	.0090139	-1.05	0.294	-.027131	.0082029
csexr	-.0139423	.0160455	-0.87	0.385	-.0453909	.0175063
cpaper	-.0556407	.0998642	-0.56	0.577	-.2513709	.1400895
nofact	.332624	.1114405	2.98	0.003	.1142046	.5510433
new_area						
2	-.1121293	.1471592	-0.76	0.446	-.400556	.1762974
3	-.1319398	.1855588	-0.71	0.477	-.4956284	.2317488
4	-.1343114	.2175862	-0.62	0.537	-.5607725	.2921498
5	.2420596	.2354676	1.03	0.304	-.2194484	.7035677
6	-.2997771	.3180277	-0.94	0.346	-.9231	.3235459
ctextiles25	.002775	.0024967	1.11	0.266	-.0021183	.0076684
ctextilechg	-.0012794	.0034126	-0.37	0.708	-.007968	.0054091
cvote25	-.0205169	.0228117	-0.90	0.368	-.065227	.0241932
cvotechg	-.0111971	.0126974	-0.88	0.378	-.0360836	.0136894
cpost	.0139856	.0237986	0.59	0.557	-.0326588	.0606301
cchurch	-.1536346	.1075459	-1.43	0.153	-.3644208	.0571515
cpres	.0086359	.0293255	0.29	0.768	-.048841	.0661128
clnrev	**.3333514**	**.0842823**	**3.96**	**0.000**	**.1681611**	**.4985417**
clnmiss	**.5197673**	**.169428**	**3.07**	**0.002**	**.1876945**	**.8518401**
clnmissnt	**-.0272863**	**.0119489**	**-2.28**	**0.022**	**-.0507058**	**-.0038669**
_cons	-9.792102	.2182736	-44.86	0.000	-10.21991	-9.364294
lnpop	1	(offset)				

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
id: Unstructured				
var(ntime)	.0009714	.0003444	.0004849	.0019461
var(_cons)	.176071	.0671515	.0833775	.3718147
cov(ntime,_cons)	-.0113067	.0045811	-.0202855	-.0023279

```
LR test vs. Poisson model: chi2(3) = 148.63              Prob > chi2 = 0.0000
```

2. Baseline Model and Model 4 refitted to anti-slavery growth to allow variation in time.

	Baseline Model		Model 4	
Random Effects Parameters	b	SE	b	SE
σ_t	0.609	0.273	0.218	0.373
σ_{t2}	0.127	0.067	0.013	0.181
σ_0	1.104	0.293	0.689	0.316
Corr(t,t2)	-0.982	31.000	-0.750	4.310
Corr(t,0)	-0.163	0.505	-0.987	0.504
Corr(t2,0)	-0.025	0.606	0.635	7.172
Test of Level-2 Variation	445	***	10.22	

Significant level-two variation in anti-slavery growth rates was estimated in the baseline model, but the variation was reduced to nonsignificant levels in Model 4. The likelihood ratio test of model fit between the Model 4 in our paper (using Poisson only) and Model 4 fitted using Multilevel Poisson is a nonsignificant 9.8 (df=6 at .01 alpha = 16.8). The results suggest that the majority of the between-county variation in anti-slavery growth rates was accounted for by counties' revivals, home missionary societies, and temperance societies. We therefore fitted all models of anti-slavery growth using Poisson regression rather than using multilevel Poisson regression.

3. Model 4 refitted to temperance growth allow variation in time^2

```
Mixed-effects Poisson regression                Number of obs     =        275
Group variable: id                              Number of groups  =         55

                                                Obs per group:
                                                              min =          5
                                                              avg =        5.0
                                                              max =          5

Integration points =   7                        Wald chi2(23)     =     584.36
Log likelihood = -772.12611                     Prob > chi2       =     0.0000
```

temp	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ntime	.5861451	.0627069	9.35	0.000	.4632418	.7090484
ntime2	-.0421264	.0060086	-7.01	0.000	-.053903	-.0303497
ntime3	.0011183	.0001977	5.66	0.000	.0007307	.0015058
cgrowth	-.0057014	.0233124	-0.24	0.807	-.0513928	.03999
urban	-.3567971	.1403666	-2.54	0.011	-.6319106	-.0816836
ctowns	-.0135231	.0078428	-1.72	0.085	-.0288946	.0018485
csexr	-.0109744	.0170273	-0.64	0.519	-.0443473	.0223986
cpaper	-.1445374	.0842163	-1.72	0.086	-.3095983	.0205235
nofact	.2713058	.0949208	2.86	0.004	.0852644	.4573472
new_area						
2	-.1562265	.1254926	-1.24	0.213	-.4021874	.0897344
3	-.0552181	.1628601	-0.34	0.735	-.3744179	.2639818
4	.0448855	.1923449	0.23	0.815	-.3321036	.4218746
5	.3018993	.2022957	1.49	0.136	-.094593	.6983916
6	-.0892082	.2873299	-0.31	0.756	-.6523645	.4739481
ctextiles25	.0033529	.0021553	1.56	0.120	-.0008714	.0075772
ctextilechg	-.0035665	.0031505	-1.13	0.258	-.0097414	.0026085
cvote25	-.0228053	.020021	-1.14	0.255	-.0620459	.0164352
cvotechg	-.0116982	.0110962	-1.05	0.292	-.0334464	.0100499
cpost	.0107675	.0209944	0.51	0.608	-.0303809	.0519158
cpres	-.0100601	.0302996	-0.33	0.740	-.0694461	.049326
clnrev	.3221598	.0753554	4.28	0.000	.1744659	.4698537
clnmiss	.4881606	.2054063	2.38	0.017	.0855717	.8907495
clnmissnt	-.0314172	.0146911	-2.14	0.032	-.0602112	-.0026232
_cons	-10.42806	.2706628	-38.53	0.000	-10.95854	-9.897566
lnpop	1	(offset)				

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
id: Unstructured				
var(ntime)	.0549127	.0163357	.0306516	.0983767
var(ntime2)	.0001322	.0000372	.0000762	.0002294
var(_cons)	1.339745	.4185032	.7263194	2.471249
cov(ntime,ntime2)	-.0026633	.0007727	-.0041778	-.0011488
cov(ntime,_cons)	-.2611605	.080673	-.4192767	-.1030444
cov(ntime2,_cons)	.0121833	.0037276	.0048773	.0194893

```
LR test vs. Poisson model: chi2(6) = 282.55              Prob > chi2 = 0.0000
```

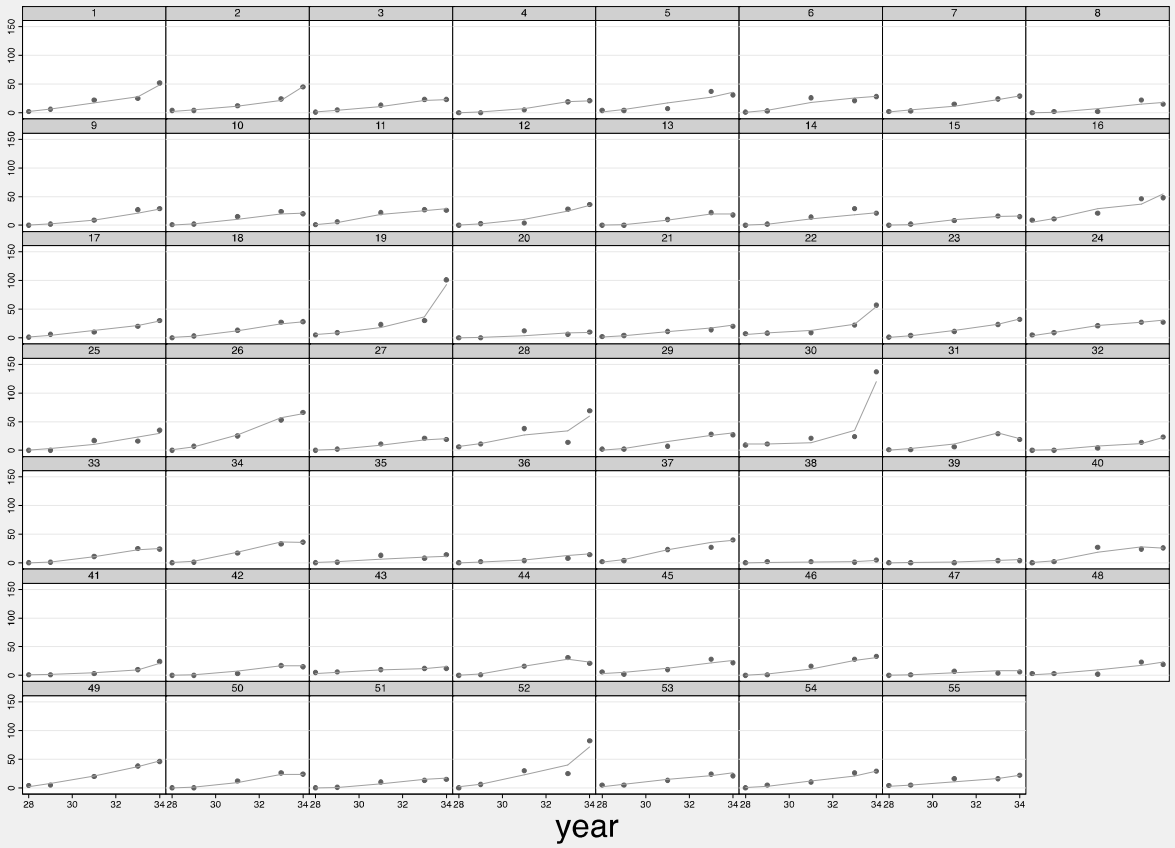
Refitted to include additional time-varying indicators of foreign-born population, lawyers, real estate value, and vote to Jackson candidate.

```
Mixed-effects Poisson regression                Number of obs     =        275
Group variable: id                              Number of groups  =         55

                                                Obs per group:
                                                              min =          5
                                                              avg =        5.0
                                                              max =          5

Integration points =   7                        Wald chi2(27)     =     626.08
Log likelihood = -761.80447                     Prob > chi2       =     0.0000
```

temp	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ntime	.5911492	.0617355	9.58	0.000	.4701499	.7121484
ntime2	-.04205	.005981	-7.03	0.000	-.0537726	-.0303275
ntime3	.0011131	.0001983	5.61	0.000	.0007244	.0015019
cgrowth	.0018908	.0243885	0.08	0.938	-.0459097	.0496914
urban	-.2507461	.1486792	-1.69	0.092	-.542152	.0406598
ctowns	-.014442	.0080469	-1.79	0.073	-.0302137	.0013298
csexr	-.0038132	.0181895	-0.21	0.834	-.0394639	.0318376
clnforborn	.0503035	.0343586	1.46	0.143	-.0170382	.1176451
lnnews	.143879	.1381704	1.04	0.298	-.1269301	.414688
lnlaw	-.4566801	.1034766	-4.41	0.000	-.6594905	-.2538698
lnvalue	-.0165624	.0819887	-0.20	0.840	-.1772574	.1441326
new_area						
2	-.2816982	.1362054	-2.07	0.039	-.5486558	-.0147406
3	-.1484808	.1746018	-0.85	0.395	-.4906939	.1937324
4	-.1396927	.2173753	-0.64	0.520	-.5657405	.2863551
5	.2650433	.2137281	1.24	0.215	-.1538561	.6839428
6	-.3168157	.3044872	-1.04	0.298	-.9135996	.2799682
nomanu	.3428206	.0981965	3.49	0.000	.1503591	.5352822
ctextiles25	.0052524	.002385	2.20	0.028	.0005778	.0099269
ctextilechg	-.0060433	.0032891	-1.84	0.066	-.0124898	.0004033
cjackson	.008483	.0040782	2.08	0.038	.0004899	.0164761
cvote25	-.0017062	.0226926	-0.08	0.940	-.0461828	.0427704
cvotechg	-.0000133	.0119028	-0.00	0.999	-.0233424	.0233159
cpost	-.0082135	.0226522	-0.36	0.717	-.052611	.036184
cpres	-.0142965	.0320957	-0.45	0.656	-.0772029	.0486099
clnrev	.2934901	.0798086	3.68	0.000	.1370681	.4499121
clnmiss	.57393	.1911753	3.00	0.003	.1992334	.9486267
clnmissnt	-.0325292	.0146707	-2.22	0.027	-.0612833	-.0037752
_cons	-10.13646	1.013052	-10.01	0.000	-12.122	-8.150913
lnpop	1	(offset)				

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
id: Unstructured				
var(ntime)	.0490156	.0148936	.0270205	.0889151
var(ntime2)	.0001199	.0000343	.0000685	.0002099
var(_cons)	1.149403	.3658956	.6158927	2.145062
cov(ntime,ntime2)	-.0023948	.0007078	-.003782	-.0010077
cov(ntime,_cons)	-.2319062	.0721315	-.3732815	-.090531
cov(ntime2,_cons)	.0110113	.0033541	.0044374	.0175852

```
LR test vs. Poisson model: chi2(6) = 277.14                 Prob > chi2 = 0.0000
```



4. Model 4 refitted using FE indicators of county.

```
Conditional fixed-effects Poisson regression    Number of obs     =        275
Group variable: id                              Number of groups  =         55

                                                Obs per group:
                                                              min =          5
                                                              avg =        5.0
                                                              max =          5
                                                Wald chi2(10)     =    1439.16
Log likelihood  = -620.05561                    Prob > chi2       =     0.0000

------------------------------------------------------------------------------
        temp |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       ntime |   .4362293   .0473034     9.22   0.000     .3435164    .5289422
      ntime2 |   -.029557    .005181    -5.70   0.000    -.0397117   -.0194024
      ntime3 |   .0008052   .0001831     4.40   0.000     .0004463    .0011641
     cgrowth |   .0298857    .032818     0.91   0.362    -.0344363    .0942078
      ctowns |   .0230344   .0374647     0.61   0.539     -.050395    .0964639
       csexr |  -.0013487   .0200368    -0.07   0.946    -.0406201    .0379227
       cpres |  -.0101988   .0316522    -0.32   0.747    -.0722361    .0518385
      clnrev |    .269099   .1324243     2.03   0.042      .009552    .5286459
     clnmiss |    .536161   .1896809     2.83   0.005     .1643932    .9079288
   clnmissnt |  -.0253946    .007808    -3.25   0.001     -.040698   -.0100913
       lnpop |          1  (offset)
------------------------------------------------------------------------------
```

Model 4 refitted using FE indicators of county and additional time-varying indicators of foreign-born population, lawyers, real estate value, vote to Jackson candidate and voting-eligible population.

```
Log likelihood  = -599.68129                    Prob > chi2       =     0.0000

------------------------------------------------------------------------------
        temp |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       ntime |   .4597075   .0485277     9.47   0.000     .3645949    .5548201
      ntime2 |  -.0312401   .0054175    -5.77   0.000    -.0418582   -.0206221
      ntime3 |   .0008393   .0001916     4.38   0.000     .0004638    .0012147
     cgrowth |   .0626636    .034938     1.79   0.073    -.0058135    .1311408
      ctowns |   .0520575   .0383523     1.36   0.175    -.0231117    .1272266
       csexr |   .0107015   .0211702     0.51   0.613    -.0307913    .0521943
  clnforborn |   .0974797    .067188     1.45   0.147    -.0342063    .2291657
      lnnews |   .3033064   .1254123     2.42   0.016     .0575028    .5491099
       lnlaw |    -.55962   .1207917    -4.63   0.000    -.7963674   -.3228726
     lnvalue |   .0556518   .0970372     0.57   0.566    -.1345376    .2458413
      nomanu |  -1.423742   1.020486    -1.40   0.163    -3.423857    .5763732
    cjackson |   .0110372   .0038753     2.85   0.004     .0034417    .0186326
    cvotepop |   .0127455    .011908     1.07   0.284    -.0105938    .0360847
       cpres |  -.0229376   .0324737    -0.71   0.480    -.0865849    .0407097
      clnrev |   .2828858    .138069     2.05   0.040     .0122755    .5534962
     clnmiss |   .6470647   .1931872     3.35   0.001     .2684248    1.025705
   clnmissnt |  -.0300764     .00808    -3.72   0.000     -.045913   -.0142399
       lnpop |          1  (offset)
------------------------------------------------------------------------------
```

5. General Estimating Equations (GEE) for temperance growth using unstructured correlation (within county across time): Time Model vs. Model 4

```
GEE population-averaged model                   Number of obs     =        275
Group and time vars:               id wave      Number of groups  =         55
Link:                                  log      Obs per group:
Family:                            Poisson                   min =          5
Correlation:                  unstructured                   avg =        5.0
                                                             max =          5
                                                Wald chi2(3)      =    5191.44
Scale parameter:                          1     Prob > chi2       =     0.0000

------------------------------------------------------------------------------
        temp |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       ntime |   .5183981   .0389761    13.30   0.000     .4420063    .5947899
      ntime2 |  -.0329048   .0043765    -7.52   0.000    -.0414826   -.0243269
      ntime3 |   .0007964   .0001516     5.25   0.000     .0004993    .0010934
       _cons |  -10.35537   .1185131   -87.38   0.000    -10.58765   -10.12309
       lnpop |          1  (offset)
------------------------------------------------------------------------------

Estimated within-id correlation matrix R:

        c1      c2      c3      c4      c5
r1  1.0000
r2  0.3437  1.0000
r3  0.2133  0.1926  1.0000
r4  0.1355  0.1132  0.2696  1.0000
r5  0.7207  0.4712  0.6640  0.4005  1.0000
```

```
GEE population-averaged model                   Number of obs     =        275
Group and time vars:               id wave      Number of groups  =         55
Link:                                  log      Obs per group:
Family:                            Poisson                   min =          5
Correlation:                  unstructured                   avg =        5.0
                                                             max =          5
                                                Wald chi2(23)     =    2855.89
Scale parameter:                           1    Prob > chi2       =     0.0000
```

temp	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ntime	.390277	.0386109	10.11	0.000	.3146011	.4659529
ntime2	-.024721	.0046747	-5.29	0.000	-.0338833	-.0155587
ntime3	.0006476	.0001729	3.75	0.000	.0003087	.0009864
cgrowth	-.0176682	.0133056	-1.33	0.184	-.0437468	.0084103
urban	-.3844921	.0805546	-4.77	0.000	-.5423762	-.226608
ctowns	-.0227477	.0044632	-5.10	0.000	-.0314955	-.0139999
csexr	-.0151379	.0094618	-1.60	0.110	-.0336828	.0034069
cpaper	-.1059091	.0515977	-2.05	0.040	-.2070387	-.0047794
nofact	.162245	.0541027	3.00	0.003	.0562057	.2682843
_Inew_area_2	-.1389954	.0699465	-1.99	0.047	-.2760881	-.0019028
_Inew_area_3	-.2333097	.0938488	-2.49	0.013	-.41725	-.0493694
_Inew_area_4	-.184782	.109396	-1.69	0.091	-.3991941	.0296302
_Inew_area_5	.1383263	.1128266	1.23	0.220	-.0828098	.3594624
_Inew_area_6	-.4184173	.1585773	-2.64	0.008	-.7292231	-.1076115
ctextiles25	.003099	.0012419	2.50	0.013	.000665	.005533
ctextilechg	-.0000678	.0017416	-0.04	0.969	-.0034813	.0033457
cvote25	-.0225169	.0116967	-1.93	0.054	-.0454421	.0004082
cvotechg	-.0100698	.0067191	-1.50	0.134	-.0232389	.0030993
cpost	.0244124	.0119069	2.05	0.040	.0010754	.0477494
cpres	.0162038	.0157773	1.03	0.304	-.0147191	.0471267
clnrev	.3389514	.0440234	7.70	0.000	.2526671	.4252358
clnmiss	.3680073	.0956092	3.85	0.000	.1806167	.5553978
clnmissnt	-.0232724	.0058637	-3.97	0.000	-.034765	-.0117798
_cons	-9.638754	.1381267	-69.78	0.000	-9.909478	-9.368031
lnpop	1	(offset)				

Estimated within-id correlation matrix R:

	c1	c2	c3	c4	c5
r1	1.0000				
r2	0.3363	1.0000			
r3	0.0223	0.1271	1.0000		
r4	-0.1158	-0.0591	-0.0356	1.0000	
r5	0.4998	0.4117	0.3111	-0.2265	1.0000

General Estimating Equations (GEE) for anti-slavery growth using unstructured correlation (within county across time): Time Model vs. Model 5

```
GEE population-averaged model                   Number of obs     =        220
Group and time vars:               id year      Number of groups  =         55
Link:                                  log      Obs per group:
Family:                            Poisson                   min =          4
Correlation:                   unstructured                  avg =        4.0
                                                             max =          4
                                                Wald chi2(2)      =     409.45
Scale parameter:                           1    Prob > chi2       =     0.0000

------------------------------------------------------------------------------
        anti |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
           t |   1.127207   .2211648     5.10   0.000     .6937314    1.560682
          t2 |  -.1244093   .0597818    -2.08   0.037    -.2415795    -.007239
       _cons |  -11.01805   .1674304   -65.81   0.000    -11.34621    -10.6899
       lnpop |          1  (offset)
------------------------------------------------------------------------------

Estimated within-id correlation matrix R:

        c1      c2      c3      c4
r1  1.0000
r2  0.3498  1.0000
r3  0.3952  0.6971  1.0000
r4  0.3907  0.6344  1.0000  1.0000
```

```
GEE population-averaged model                   Number of obs     =        220
Group and time vars:              id year       Number of groups  =         55
Link:                                log       Obs per group:
Family:                          Poisson                    min =          4
Correlation:                unstructured                    avg =        4.0
                                                            max =          4
                                                Wald chi2(22)     =     454.08
Scale parameter:                         1      Prob > chi2       =     0.0000
```

anti	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
t	1.221898	.1804343	6.77	0.000	.8682531	1.575542
t2	-.19603	.0380908	-5.15	0.000	-.2706866	-.1213735
_Inew_area_2	-1.113177	.1812263	-6.14	0.000	-1.468374	-.7579802
_Inew_area_3	-.43502	.1983522	-2.19	0.028	-.8237832	-.0462568
_Inew_area_4	-1.116386	.3976539	-2.81	0.005	-1.895773	-.3369987
_Inew_area_5	-.428278	.3505734	-1.22	0.222	-1.115389	.2588331
_Inew_area_6	-2.292424	.538882	-4.25	0.000	-3.348613	-1.236235
cgrowth	-.1224319	.0500855	-2.44	0.015	-.2205977	-.024266
urban	-.5838518	.2565693	-2.28	0.023	-1.086718	-.0809853
ctowns	.0454825	.0137499	3.31	0.001	.0185332	.0724319
csexr	-.003217	.0250403	-0.13	0.898	-.052295	.045861
clnpaperp	.8424352	.2302678	3.66	0.000	.3911185	1.293752
ctextiles	.0223459	.0084869	2.63	0.008	.0057119	.0389799
ctextilechg	.0211807	.0092762	2.28	0.022	.0029997	.0393617
nofact	.7602122	.1797608	4.23	0.000	.4078876	1.112537
cpostp	-.1005161	.0471139	-2.13	0.033	-.1928577	-.0081745
cvote35	-.1849467	.0371322	-4.98	0.000	-.2577244	-.112169
clnvotechg	.363254	.1401587	2.59	0.010	.0885481	.6379599
cclergyp	.0317846	.0489975	0.65	0.517	-.0642488	.1278179
clnrev	.2299353	.1317446	1.75	0.081	-.0282794	.48815
himiss	.4251343	.1408741	3.02	0.003	.1490261	.7012424
clntempno	.1527295	.0650814	2.35	0.019	.0251724	.2802866
_cons	-10.67138	.2903332	-36.76	0.000	-11.24042	-10.10233
lnpop	1	(offset)				

Estimated within-id correlation matrix R:

	c1	c2	c3	c4
r1	1.0000			
r2	0.3642	1.0000		
r3	0.2176	0.4220	1.0000	
r4	-0.1413	0.0425	0.5896	1.0000