Online appendix

Breaking out of Legacy Mobilization Networks: How the Internet Reaches and Activates the Politically Disengaged

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Replication materials are available on the Harvard Dataverse https://doi.org/10.7910/DVN/MNHJTQ.

1 Definition of the hexagonal grid

A hexagonal cell size of approximately 15 km is defined with `italy.sf` as the bounding box.

```
italy_hex.sf <-
  sf::st_make_grid(italy.sf,
                   15000,
                   what = "polygons",
                   square = FALSE)

italy_hex.sf <-
  sf::st_sf(index = 1:length(lengths(italy_hex.sf)),
            italy_hex.sf)
```

The resulting `italy_hex.sf` is then cropped using `italy.sf` as mask.

```
italy_hex_cropped.sf <-
  sf::st_intersection(italy_hex.sf,
                      italy.sf %>% st_make_valid())
```

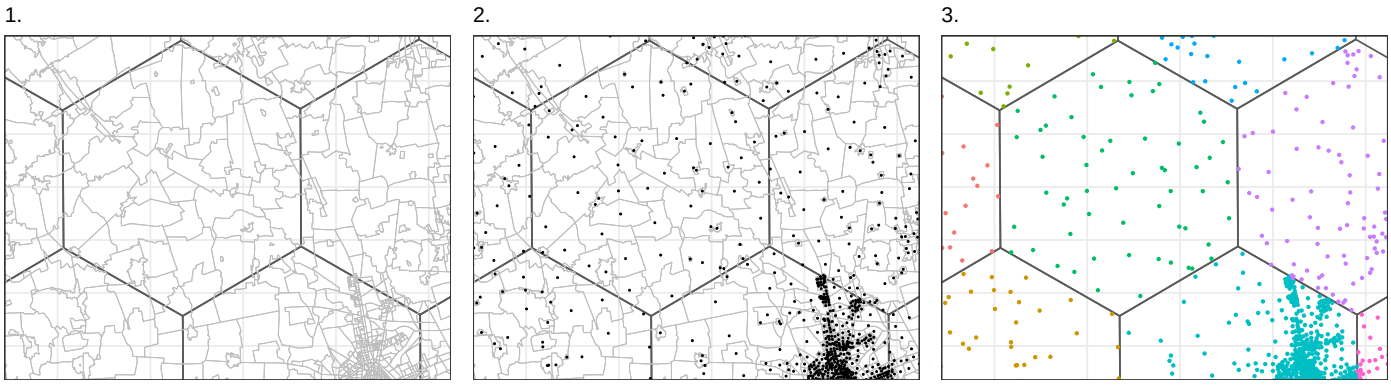
2 Intersection between census sections and hexagonal cells for count variables

To map census count variables measured at the level of census sections with hexagonal cells, I proceeded as follows:

1. I computed the centroid, or its geographic centre, of the census sections;
2. I intersected centroids and hexagonal cells;
3. For each hexagonal cell, I summed the count variables pertaining to the census sections with a centroid contained within the cell.

Table A1: Population and density of hexagon cells

		population				density (per km2)			
ordinal	n. cells	tot	%	min	max	min	max	mean	median
1	864	4454720	7.50	1	13179	0.01	67.63	26.46	24.43
2	383	7420824	12.49	13200	27548	67.74	141.38	99.44	98.24
3	302	11849829	19.94	27550	57722	141.39	296.23	201.37	190.51
4	153	11857660	19.95	57859	110254	296.93	565.82	397.74	382.59
5	92	20631967	34.71	110392	800305	566.53	4107.17	1150.91	853.89
6	3	3218744	5.42	816961	1445829	4192.65	7420.00	5506.20	4905.96
NA	78	0	0.00	0	0	0.00	0.00	0.00	0.00



- Sections of the 2011 census: 402,678;
- Hexagon cells associated with at least one census section: 1843;
- Distribution of census sections by hexagon cells: Min Min.: 1, 1st Qu.: 60, Median: 110, Mean: 218.490504612046, 3rd Qu.: 216, Max.: 7053

3 Intersection between municipality and hexagonal cells for vote variables

To map municipality *comune* count variables onto hexagon cells, I proceeded as follows:

1. For each municipality, vote counts were distributed across all the census sections found within the municipality boundaries proportionally to the size of the population residing in each cell.
2. Vote counts estimated for each census section were then assigned to hexagonal cells containing the sections' centroid, with the same method used for the census variables.

4 Cell selection for the spatial analysis

Population density varies significantly across the country and cells. I created an ordinal variable to capture this variation with a 6-point scale index. The variables with key statistics for each group are presented in Table A1.

The 864 cells (46%) with an ordinal value of 1 on the density index are excluded from the spatial analysis. These cells cumulatively contain about 7.5% of the national population (or 4,454,720 people) but are considered sparsely populated as their median density is only 24.4 people per km^2.

The geographic distribution based on the population density ordinal variable is mapped in Figure A1.

5 Meetup event data

Meetup event data were directly collected from the API of Meetup.com at different times between 2014 and 2018 using search terms related to the Movement (`beppe+grillo`, `movimento+5+stelle`, `movimento+cinque+stelle`, and `m5s`)

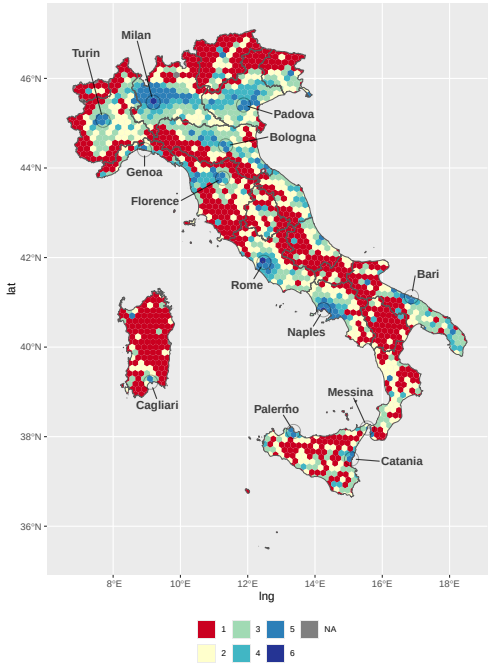


Figure A1: Population density ordinal variable

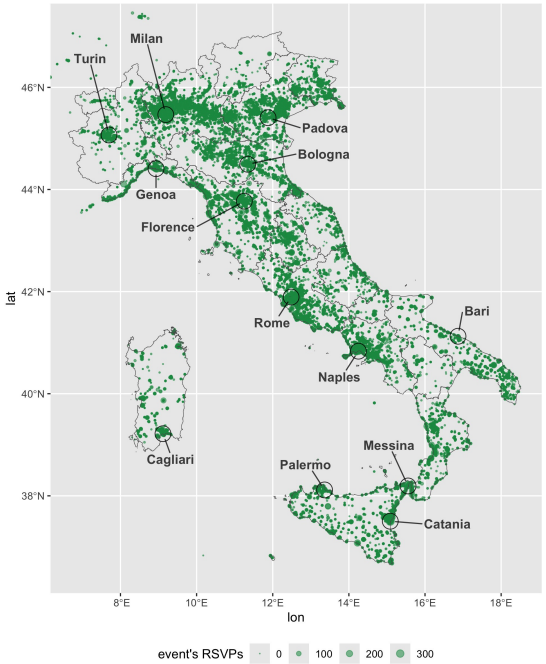


Figure A2: Geocoded meetup events present in the data

- Number of meetup unique events: 234,064;
- Meetup events by data collection date: 2014-08-01: 100,138, 2014-08-02: 15,197, 2015-06-26: 36,473, 2016-10-24: 42,988, 2018-03-13: 32,435, 2018-07-03: 6,833
- First meetup event (by creation time): 2005-06-11 00:45:08;
- Last meetup event (by creation time): 2018-07-02 15:40:10;
- Number of venues: 46,070;
- Number of meetup groups: 2876;
- Number of meetup groups with at least one event: 2023;
- Number of meetup groups that at least once were found not to be private: 2438.

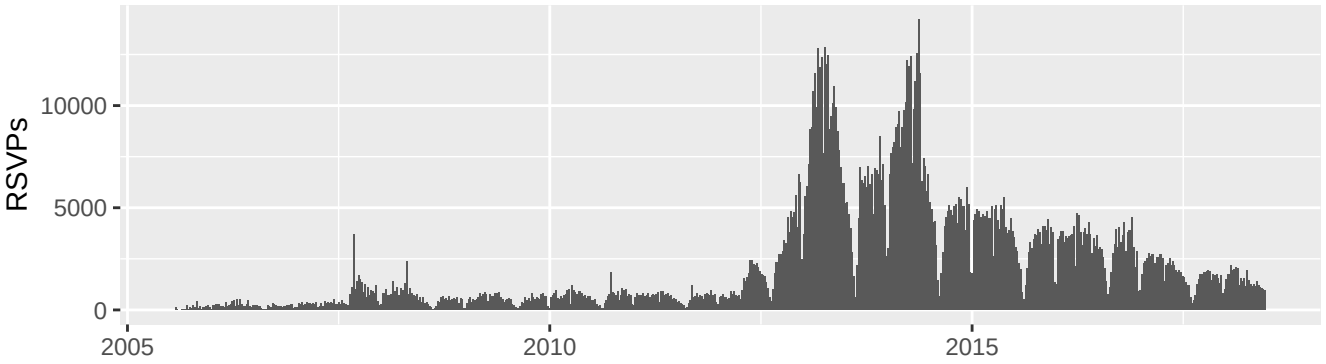


Figure A3: Meetup RSVP count by week

6 Intersection between meetup event data and hexagonal cells for RSVP counts

To associate meetup activity with hexagon cells, I intersect the locations of venues with the hexagonal grid. Events that are organised at a venue located within the boundary of a cell and their RSVPs are associated with that cell (see Figure A4).

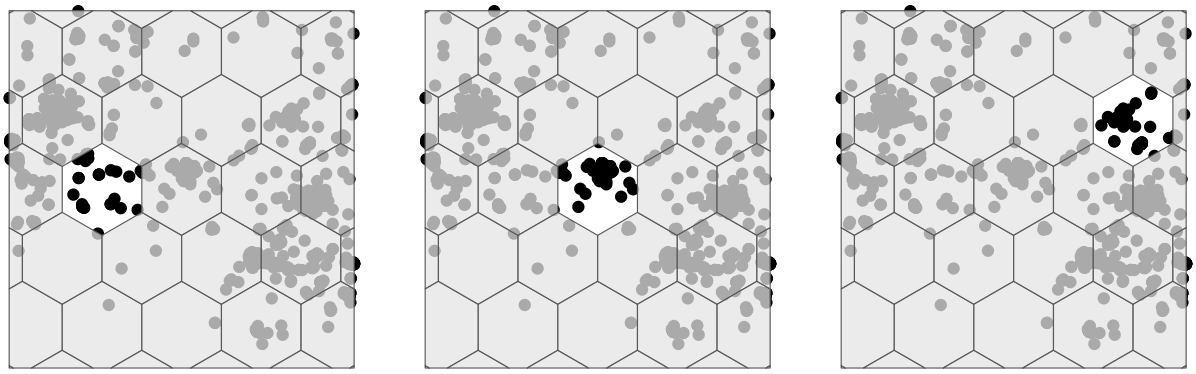


Figure A4: Intersection between meetup event data and hexagonal cells for RSVP counts

7 Intersection between meetup event data and municipality boundaries for RSVP counts

The association between meetup event data and municipalities is obtained by intersecting the boundaries of the municipalities with the hexagonal grid. All the meetup events and corresponding RSVPs organised within the boundaries of the hexagonal cells are then passed over to the associated municipalities. Two geographies intersect if they have any number of points in common. As a result, a municipality can also be associated with events that are not within its boundaries in its close proximity (up to 15 km from the boundaries). Three examples are illustrated in Figure A5.

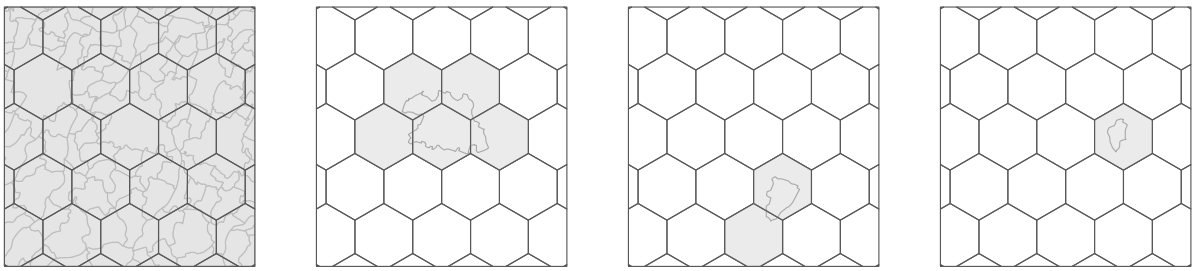


Figure A5: Intersection between meetup event data and municipality boundaries for RSVP counts

8 Change point regression model

Two change points in the time series of 386 weekly counts of RSVPs to meetup events (`sum_yes_rsvp_count`) organised everywhere between 28 July 2005 and 27 December 2012 are identified using the mcp R package for multiple change point Bayesian regressions and the following model specification:

```
model <- list(
  sum_yes_rsvp_count ~ 1 + week_num,
  ~ 1 + week_num,
  ~ 1 + week_num
)
```

Posterior distribution as well as sampling diagnostics are presented below. `Rhat` is the Gelman-Rubin convergence diagnostic (lack of convergence is indicated by values above 1) while `n.eff` is the effective sample size.

Figure A6 shows posteriors and convergence of the two change point parameters.

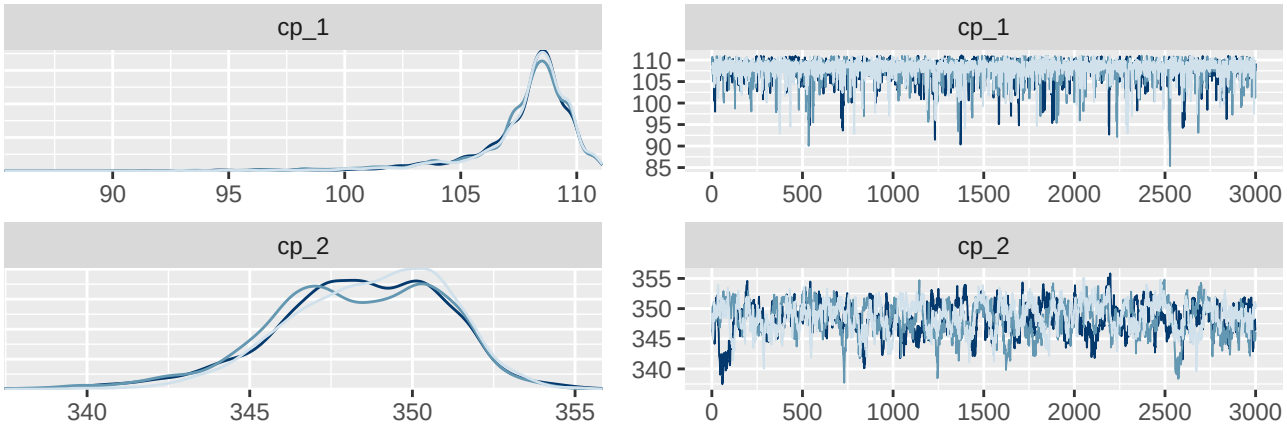


Figure A6: Posteriors and convergence of multiple change point analysis

The top panel of Figure A7 include the count of weekly RSVPs as points, fitted lines and the two change points posterior density for each of the three chains. The bottom panel of Figure A7 presents the same data points of weekly counts as histograms and the two change points of 16 August 2007 and 22 March 2012.

9 Spatial analysis: regression models

I specified three models to conduct the spatial analysis.

1. A model predicting meetup RSVPs using two social capital variables: turnout and presence of associations;
2. A model predicting meetup RSVPs using four demographics (as a percentage of the population): population with a university degree, population unemployed, population working as homemakers, and population over 65.
3. A model predicting M5S vote using the same four demographics and meetup RSVPs. In this model all independent variables are scaled to facilitate the visual interpretation of the coefficients.

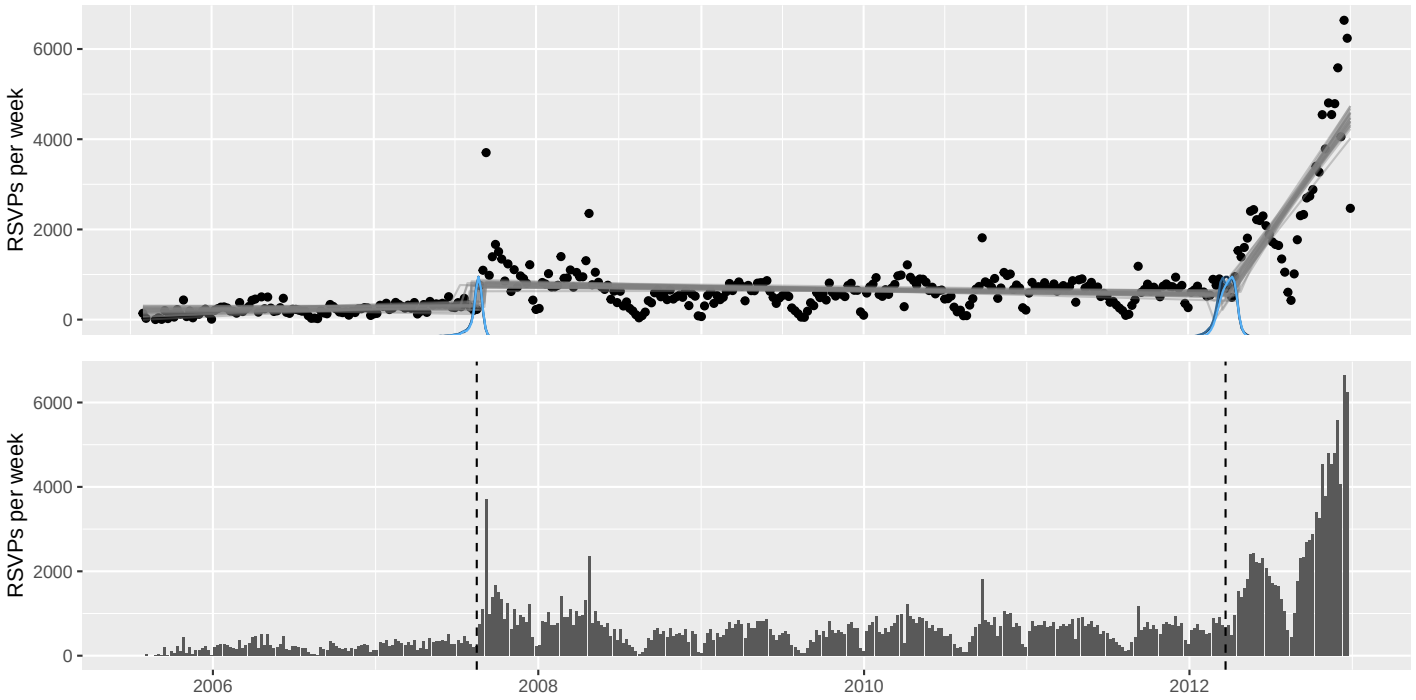


Figure A7: Estimation of change points in the time series of RSVPs weekly counts

An ordinal variable controlling for population density is added to every specification. Additionally, all RSVP variables are subjected to a square transformation assuming a declining marginal effect of additional RSVPs. The variable capturing the difference of RSVPs between the two periods is the difference of two square values.

All models are fit using the function `S.CARleroux` from the R package CARBayes and the following arguments:

```
S.CARleroux(
  formula,
  data,
  family = "gaussian",
  W = hex.m,
  burnin=100000, n.sample=300000, thin=100
)
```

`hex.m` is a 914 × 914 neighbourhood matrix with its elements assuming the value 1 if the two corresponding hexagon cells share a boundary and 0 otherwise. The formula is run to generate three independent Markov chains, which are used for the inferential analysis. Each times it runs the formula will generate 300,000 MCMC samples (`n.sample`), 100,000 of which are then discarded (the so-called `burnin` period), while the remaining 200,000 are `thin`ned by 100 to reduce their temporal autocorrelation[1].

[1]Lee, Duncan. 2013. "Carbayes: An R Package for Bayesian Spatial Modeling with Conditional Autoregressive Priors." Journal of Statistical Software 55 (13): 1–24. https://doi.org/10.18637/jss.v055.i13.

9.1 Variables

Table A2: Spatial analysis regression models: Continuous variables

name	min	max	mean	median	sd
M5S vote 2013 (%)	1.4503	27.6103	14.8857	14.9011	3.4494
Meetup RSVPs Period 1 2007-12 (%)	0.0000	4.5941	0.1459	0.0029	0.3751
Meetup RSVPs Period 1 2007-12 (sqrt)	0.0000	0.2143	0.0210	0.0053	0.0320
Meetup RSVPs Period 2 (sqrt) - Period 1 (sqrt)	-4920.8927	4729.6624	175.9314	0.0000	788.5968
Meetup RSVPs Period 2 2012-13 (%)	0.0000	2.5032	0.2134	0.0411	0.3878
Meetup RSVPs Period 2 2012-13 (sqrt)	0.0000	0.1582	0.0303	0.0203	0.0349
hh with Internet 2007-12	35.2778	55.6408	47.1479	47.9333	5.4126
hh with Internet 2013	44.9418	72.3188	60.2165	60.9000	6.1709
pop. homemaker (%)	3.8313	21.7070	9.6760	8.9081	3.4550
pop. over 65 (%)	11.0105	29.8796	20.9954	21.0303	3.2434
pop. unemployed (%)	0.7238	9.3133	3.2874	3.0641	1.1301
pop. with degree (%)	3.2847	25.6070	8.9724	8.3139	2.9789
staff not-for-profit ass. (%)	0.0402	34.8243	3.0742	2.7180	2.3604
staff not-for-profit ass. (sqrt)	0.0200	0.5901	0.1662	0.1649	0.0560
turnout 2006-08 (mean %)	48.5049	78.7951	65.1021	65.5393	4.1153

Table A3: Categorical variable

pop. density (ordinal)	2:369	3:299	4:151	5: 92	6: 3

9.2 Model summaries

9.2.1 Predicting meetup RSVPs in 2007-2012: Model 1

Table A4: Predicting meetup RSVPs in 2007-2012: Model 1, Chain 1

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	-0.0210	-0.0632	0.0234	2000	100.0	2000.0	0.2	914
turnout 2006-08	0.0816	0.0146	0.1450	2000	100.0	2000.0	-1.1	914
staff not-for-profit ass. (sqrt)	0.0577	0.0102	0.1039	2000	100.0	2000.0	-0.4	914
hh with Internet	-0.0053	-0.0626	0.0476	2000	100.0	1833.6	1.8	914
pop. density (ordinal, linear)	0.0564	0.0368	0.0760	2000	100.0	2000.0	0.7	914
pop. density (ordinal, quadratic)	0.0149	-0.0017	0.0313	2000	100.0	2000.0	0.5	914
pop. density (ordinal, cubic)	0.0026	-0.0077	0.0128	2000	100.0	2000.0	-0.4	914
pop. density (ordinal, quartic)	0.0035	-0.0021	0.0088	2000	100.0	2000.0	0.1	914
nu2	0.0005	0.0004	0.0006	2000	100.0	2000.0	1.5	914
tau2	0.0008	0.0006	0.0010	2000	100.0	2000.0	-1.6	914
rho	0.5753	0.4178	0.7215	2000	47.1	2000.0	1.4	914

Table A5: Predicting meetup RSVPs in 2007-2012: Model 1, Chain 2

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	-0.0214	-0.0662	0.0204	2000	100.0	2270.6	1.4	914
turnout 2006-08	0.0814	0.0195	0.1484	2000	100.0	2325.0	-1.8	914
staff not-for-profit ass. (sqrt)	0.0578	0.0151	0.1016	2000	100.0	2000.0	-0.2	914
hh with Internet	-0.0045	-0.0610	0.0523	2000	100.0	2000.0	0.5	914
pop. density (ordinal, linear)	0.0562	0.0350	0.0763	2000	100.0	2000.0	0.3	914
pop. density (ordinal, quadratic)	0.0147	-0.0021	0.0318	2000	100.0	2835.4	0.3	914
pop. density (ordinal, cubic)	0.0025	-0.0081	0.0128	2000	100.0	2501.2	0.0	914
pop. density (ordinal, quartic)	0.0034	-0.0026	0.0089	2000	100.0	2000.0	-1.4	914
nu2	0.0005	0.0004	0.0006	2000	100.0	2000.0	1.3	914
tau2	0.0008	0.0006	0.0010	2000	100.0	2000.0	0.1	914
rho	0.5728	0.4116	0.7319	2000	44.3	1494.3	-0.8	914

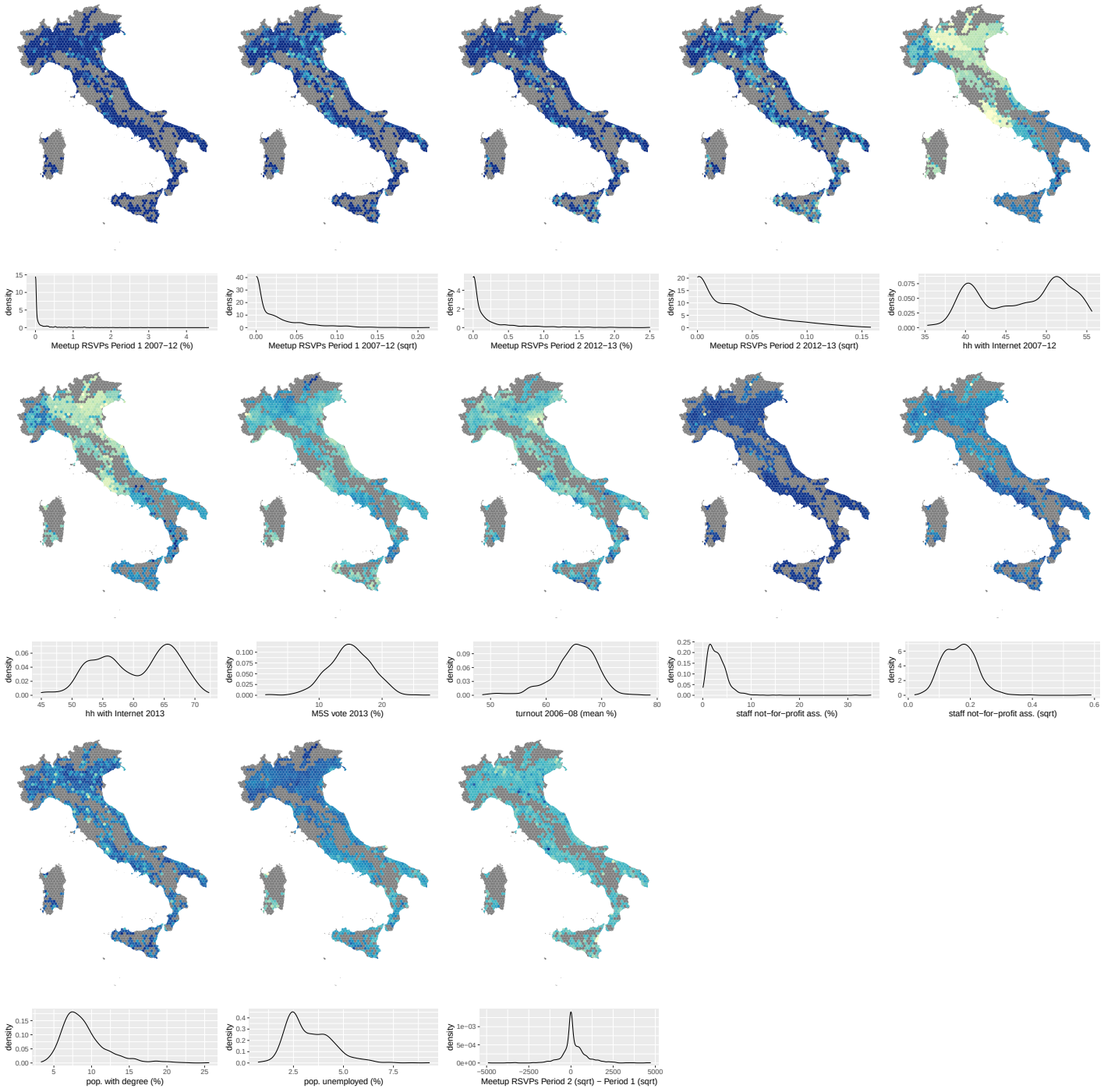


Figure A8: Distribution of continuous for used in the spatial analysis

Table A6: Predicting meetup RSVPs in 2007-2012: Model 1, Chain 3

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	-0.0199	-0.0641	0.0248	2000	100.0	2000.0	-0.5	914
turnout 2006-08	0.0800	0.0135	0.1493	2000	100.0	2154.1	0.9	914
staff not-for-profit ass. (sqrt)	0.0583	0.0122	0.1010	2000	100.0	2000.0	-0.5	914
hh with Internet	-0.0058	-0.0613	0.0502	2000	100.0	2000.0	-0.6	914
pop. density (ordinal, linear)	0.0564	0.0363	0.0760	2000	100.0	2000.0	-0.9	914
pop. density (ordinal, quadratic)	0.0148	-0.0016	0.0312	2000	100.0	2000.0	-1.4	914
pop. density (ordinal, cubic)	0.0025	-0.0075	0.0124	2000	100.0	2000.0	-1.0	914
pop. density (ordinal, quartic)	0.0034	-0.0019	0.0089	2000	100.0	2138.0	0.9	914
nu2	0.0005	0.0004	0.0006	2000	100.0	1865.5	-1.0	914
tau2	0.0008	0.0006	0.0010	2000	100.0	2000.0	1.8	914
rho	0.5739	0.4164	0.7188	2000	38.3	2000.0	0.1	914

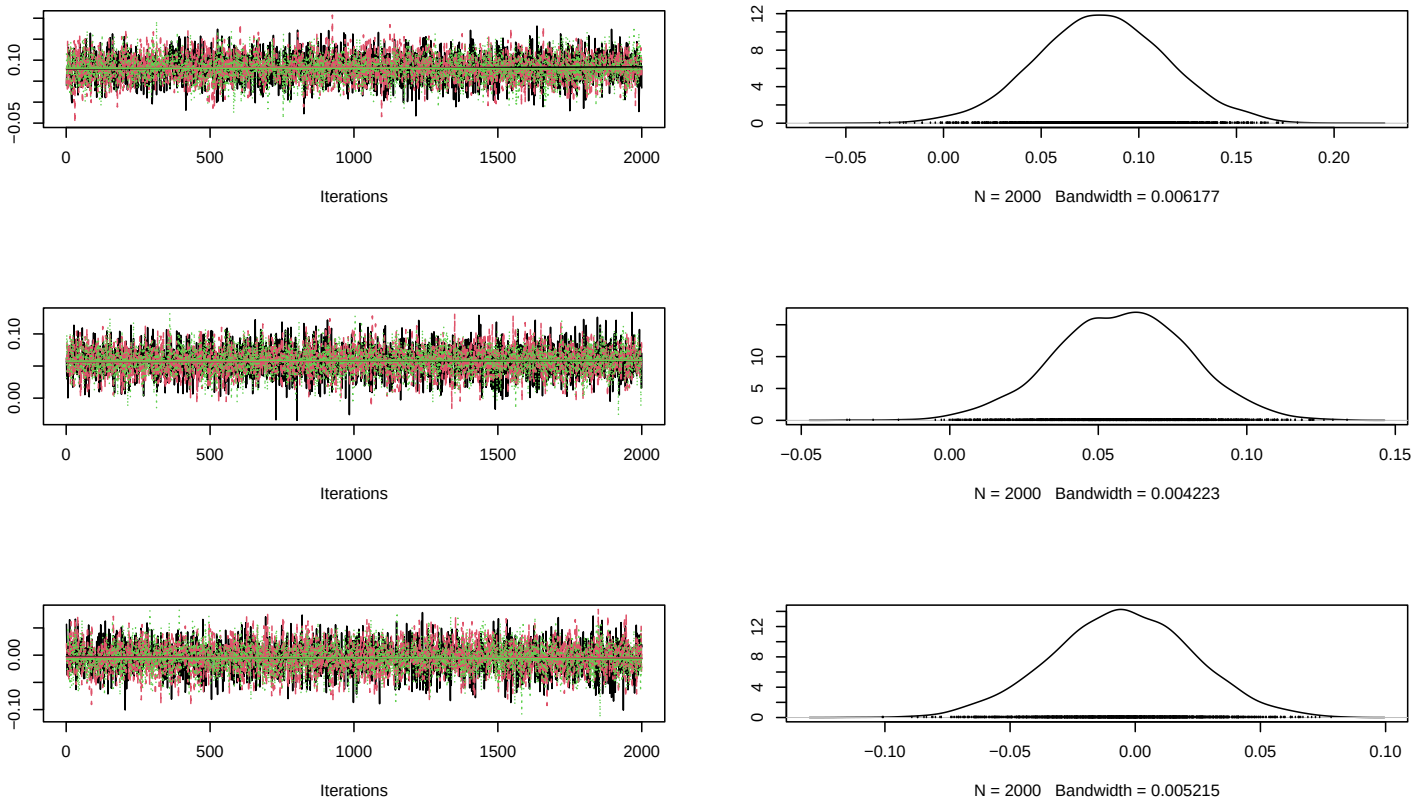


Figure A9: Predicting meetup RSVPs in 2007-2012: Model 1, Convergence of the three Markov chains

Table A7: Predicting meetup RSVPs in 2007-2012: Model 1, Potential scale reduction factor (multivariate PSRF: 1.001768)

Point est.	Upper C.I.
1.0007757	1.0038843
1.0009502	1.0032152
0.9997247	0.9999292
1.0001276	1.0015880
1.0013853	1.0014821
1.0013026	1.0013328
1.0009131	1.0010521
1.0013276	1.0036216

9.2.2 Predicting meetup RSVPs in 2007-2012: Model 2

Table A8: Predicting meetup RSVPs in 2007-2012: Model 2, Chain 1

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	0.0004	-0.0408	0.0441	2000	100.0	2000.0	-1.2	914
hh with Internet	0.0034	-0.0540	0.0595	2000	100.0	2000.0	2.0	914
pop. with degree	0.2577	0.1740	0.3420	2000	100.0	2000.0	-0.4	914
pop. unemployed	0.0701	-0.2176	0.3538	2000	100.0	2000.0	-0.7	914
pop. homemaker	-0.0742	-0.1754	0.0227	2000	100.0	2205.7	0.2	914
pop. over 65	0.0515	-0.0338	0.1411	2000	100.0	2275.8	0.1	914
pop. density (ordinal, linear)	0.0309	0.0108	0.0522	2000	100.0	2000.0	0.0	914
pop. density (ordinal, quadratic)	0.0044	-0.0125	0.0215	2000	100.0	2000.0	0.1	914
pop. density (ordinal, cubic)	-0.0015	-0.0119	0.0089	2000	100.0	2000.0	-0.6	914
pop. density (ordinal, quartic)	0.0018	-0.0040	0.0071	2000	100.0	2195.9	1.2	914
nu2	0.0004	0.0004	0.0005	2000	100.0	2000.0	0.4	914
tau2	0.0008	0.0006	0.0009	2000	100.0	2000.0	0.0	914
rho	0.6058	0.4496	0.7547	2000	45.1	2000.0	-0.4	914

Table A9: Predicting meetup RSVPs in 2007-2012: Model 2, Chain 2

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	0.0004	-0.0413	0.0441	2000	100	2000.0	-1.1	914
hh with Internet	0.0029	-0.0580	0.0583	2000	100	2000.0	0.6	914
pop. with degree	0.2592	0.1774	0.3434	2000	100	2164.2	0.2	914
pop. unemployed	0.0636	-0.2022	0.3572	2000	100	1810.1	0.9	914
pop. homemaker	-0.0722	-0.1727	0.0276	2000	100	2000.0	-0.6	914
pop. over 65	0.0530	-0.0291	0.1380	2000	100	2000.0	1.3	914
pop. density (ordinal, linear)	0.0317	0.0121	0.0529	2000	100	2000.0	-0.2	914
pop. density (ordinal, quadratic)	0.0050	-0.0111	0.0211	2000	100	2000.0	-0.2	914
pop. density (ordinal, cubic)	-0.0012	-0.0113	0.0091	2000	100	2000.0	0.5	914
pop. density (ordinal, quartic)	0.0019	-0.0034	0.0075	2000	100	2000.0	0.7	914
nu2	0.0004	0.0004	0.0005	2000	100	2000.0	0.5	914
tau2	0.0008	0.0006	0.0010	2000	100	1919.0	-0.5	914
rho	0.6043	0.4471	0.7524	2000	50	2000.0	-0.3	914

Table A10: Predicting meetup RSVPs in 2007-2012: Model 2, Chain 3

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	0.0005	-0.0401	0.0425	2000	100.0	2000.0	0.7	914
hh with Internet	0.0027	-0.0571	0.0592	2000	100.0	2000.0	-0.7	914
pop. with degree	0.2587	0.1743	0.3404	2000	100.0	2000.0	-0.2	914
pop. unemployed	0.0684	-0.2114	0.3591	2000	100.0	1977.4	0.3	914
pop. homemaker	-0.0715	-0.1767	0.0279	2000	100.0	2015.2	-0.9	914
pop. over 65	0.0520	-0.0329	0.1396	2000	100.0	2000.0	0.5	914
pop. density (ordinal, linear)	0.0316	0.0102	0.0525	2000	100.0	2000.0	1.5	914
pop. density (ordinal, quadratic)	0.0048	-0.0119	0.0217	2000	100.0	2000.0	0.7	914
pop. density (ordinal, cubic)	-0.0015	-0.0119	0.0090	2000	100.0	2149.1	0.6	914
pop. density (ordinal, quartic)	0.0019	-0.0037	0.0073	2000	100.0	2000.0	0.5	914
nu2	0.0004	0.0004	0.0005	2000	100.0	2000.0	-1.2	914
tau2	0.0008	0.0006	0.0009	2000	100.0	2000.0	1.0	914
rho	0.6028	0.4463	0.7489	2000	45.6	2000.0	0.8	914

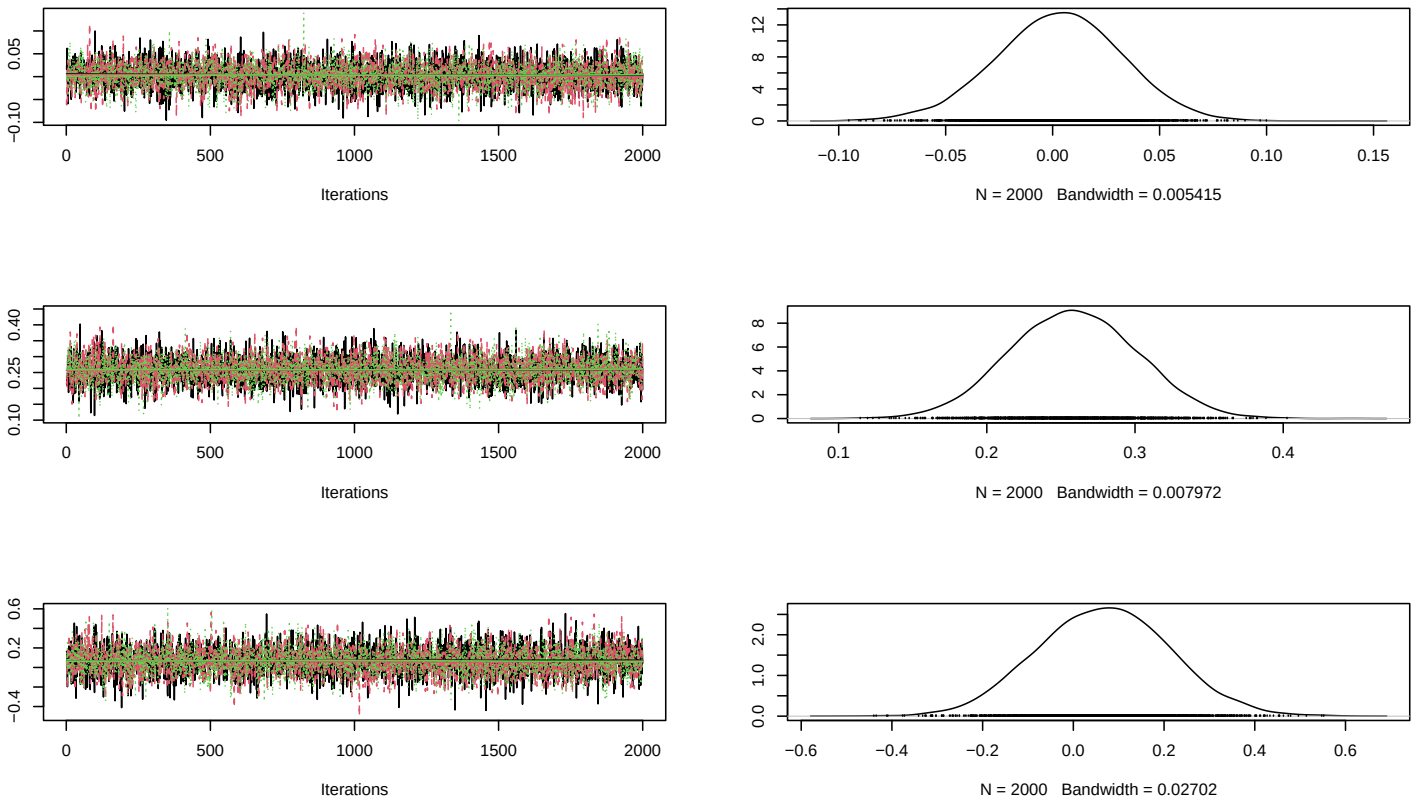


Figure A10: Predicting meetup RSVPs in 2007-2012: Model 2, Convergence of the three Markov chains

Table A11: Predicting meetup RSVPs in 2007-2012: Model 2, Potential scale reduction factor (multivariate PSRF: 1.007502)

Point est.	Upper C.I.
0.9996903	1.000121
0.9997398	1.000057
0.9998722	1.000641
1.0024692	1.009012
1.0005186	1.002473
0.9998405	1.000306
1.0011583	1.005392
1.0010527	1.005142
1.0000494	1.001204
1.0003405	1.001867

9.2.3 Predicting meetup RSVPs in 2012-2013: Model 1

Table A12: Predicting meetup RSVPs in 2012-2013: Model 1, Chain 1

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	0.0490	-0.0072	0.1050	2000	100.0	2505.6	-0.6	914
turnout 2006-08	0.0110	-0.0613	0.0866	2000	100.0	2456.1	1.5	914
staff not-for-profit ass. (sqrt)	0.0344	-0.0154	0.0848	2000	100.0	2000.0	-0.1	914
hh with Internet	-0.0301	-0.0855	0.0239	2000	100.0	2194.4	-1.2	914
pop. density (ordinal, linear)	0.0417	0.0208	0.0635	2000	100.0	2000.0	-0.6	914
pop. density (ordinal, quadratic)	-0.0003	-0.0178	0.0182	2000	100.0	2000.0	-0.7	914
pop. density (ordinal, cubic)	0.0001	-0.0109	0.0113	2000	100.0	2177.5	-0.7	914
pop. density (ordinal, quartic)	-0.0012	-0.0072	0.0048	2000	100.0	2000.0	-0.9	914
nu2	0.0005	0.0004	0.0006	2000	100.0	2000.0	-0.3	914
tau2	0.0010	0.0008	0.0013	2000	100.0	2000.0	0.6	914
rho	0.7215	0.5819	0.8443	2000	41.2	2000.0	0.1	914

Table A13: Predicting meetup RSVPs in 2012-2013: Model 1, Chain 2

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	0.0493	-0.0059	0.1043	2000	100.0	2000.0	0.7	914
turnout 2006-08	0.0103	-0.0660	0.0839	2000	100.0	2161.7	-0.8	914
staff not-for-profit ass. (sqrt)	0.0334	-0.0152	0.0853	2000	100.0	2000.0	-0.2	914
hh with Internet	-0.0294	-0.0840	0.0235	2000	100.0	1940.6	0.5	914
pop. density (ordinal, linear)	0.0419	0.0202	0.0633	2000	100.0	2000.0	1.5	914
pop. density (ordinal, quadratic)	0.0002	-0.0176	0.0185	2000	100.0	2000.0	1.7	914
pop. density (ordinal, cubic)	0.0002	-0.0108	0.0119	2000	100.0	2000.0	1.1	914
pop. density (ordinal, quartic)	-0.0012	-0.0071	0.0051	2000	100.0	2278.0	1.5	914
nu2	0.0005	0.0004	0.0006	2000	100.0	2000.0	0.9	914
tau2	0.0010	0.0008	0.0013	2000	100.0	2000.0	0.0	914
rho	0.7212	0.5778	0.8433	2000	47.8	1865.4	1.2	914

Table A14: Predicting meetup RSVPs in 2012-2013: Model 1, Chain 3

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	0.0498	-0.0053	0.1019	2000	100.0	2000.0	1.3	914
turnout 2006-08	0.0105	-0.0610	0.0830	2000	100.0	2000.0	-1.0	914
staff not-for-profit ass. (sqrt)	0.0332	-0.0156	0.0834	2000	100.0	2000.0	-1.7	914
hh with Internet	-0.0300	-0.0830	0.0244	2000	100.0	2000.0	0.1	914
pop. density (ordinal, linear)	0.0425	0.0208	0.0637	2000	100.0	1760.3	1.5	914
pop. density (ordinal, quadratic)	0.0006	-0.0172	0.0189	2000	100.0	1742.9	1.6	914
pop. density (ordinal, cubic)	0.0005	-0.0102	0.0112	2000	100.0	1826.8	1.9	914
pop. density (ordinal, quartic)	-0.0010	-0.0071	0.0048	2000	100.0	2000.0	1.1	914
nu2	0.0005	0.0004	0.0006	2000	100.0	2000.0	-0.3	914
tau2	0.0010	0.0008	0.0013	2000	100.0	2000.0	-0.1	914
rho	0.7206	0.5801	0.8348	2000	43.1	2385.6	-0.3	914

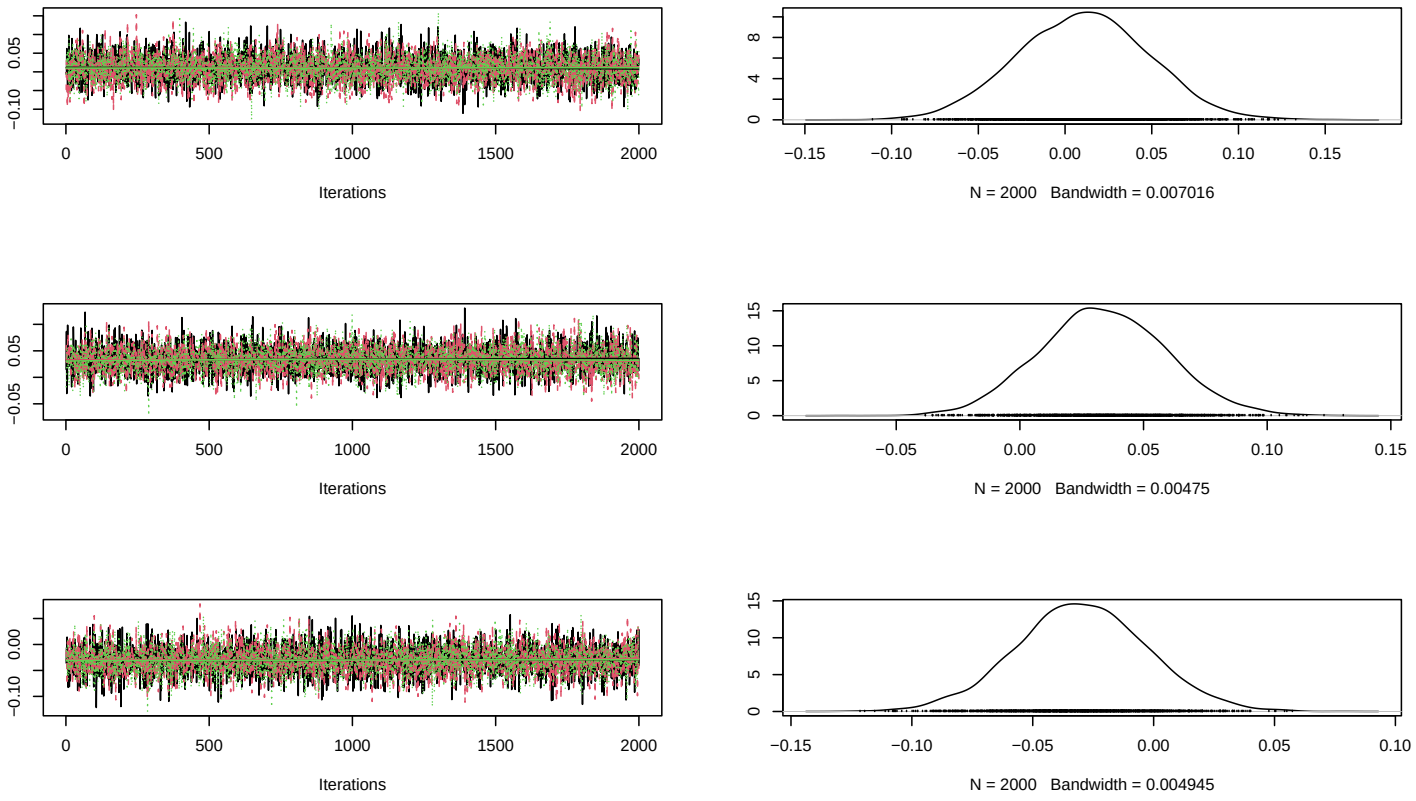


Figure A11: Predicting meetup RSVPs in 2012-2013: Model 1, Convergence of the three Markov chains

Table A15: Predicting meetup RSVPs in 2012-2013: Model 1, Potential scale reduction factor (multivariate PSRF: 1.002466)

Point est.	Upper C.I.
1.0000359	1.0002191
0.9996900	1.0000769
1.0010027	1.0036298
0.9995663	0.9995839
1.0004375	1.0029357
1.0001498	1.0018354
0.9998184	1.0005687
1.0011778	1.0044978

9.2.4 Predicting meetup RSVPs in 2012-2013: Model 2

Table A16: Predicting meetup RSVPs in 2012-2013: Model 2, Chain 1

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	-0.0150	-0.0613	0.0307	2000	100.0	2000.0	-0.4	914
hh with Internet	-0.0132	-0.0635	0.0372	2000	100.0	2000.0	0.2	914
pop. with degree	0.2845	0.1969	0.3736	2000	100.0	2000.0	-1.1	914
pop. unemployed	0.0846	-0.2376	0.4132	2000	100.0	2000.0	0.2	914
pop. homemaker	0.1733	0.0611	0.2873	2000	100.0	2000.0	0.0	914
pop. over 65	0.0600	-0.0312	0.1536	2000	100.0	2000.0	0.8	914
pop. density (ordinal, linear)	0.0131	-0.0096	0.0350	2000	100.0	2000.0	-0.9	914
pop. density (ordinal, quadratic)	-0.0117	-0.0292	0.0062	2000	100.0	2000.0	-0.9	914
pop. density (ordinal, cubic)	-0.0042	-0.0150	0.0070	2000	100.0	2449.2	-1.3	914
pop. density (ordinal, quartic)	-0.0024	-0.0085	0.0035	2000	100.0	2000.0	-1.2	914
nu2	0.0005	0.0004	0.0006	2000	100.0	1861.4	0.2	914
tau2	0.0010	0.0007	0.0012	2000	100.0	2000.0	0.2	914
rho	0.6868	0.5473	0.8111	2000	39.3	2000.0	-0.2	914

Table A17: Predicting meetup RSVPs in 2012-2013: Model 2, Chain 2

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	-0.0159	-0.0643	0.0322	2000	100.0	1270.4	0.7	914
hh with Internet	-0.0118	-0.0649	0.0382	2000	100.0	1831.1	-1.2	914
pop. with degree	0.2843	0.1911	0.3730	2000	100.0	2000.0	-0.8	914
pop. unemployed	0.0764	-0.2686	0.4096	2000	100.0	2139.9	0.3	914
pop. homemaker	0.1757	0.0658	0.2838	2000	100.0	2000.0	-0.9	914
pop. over 65	0.0598	-0.0339	0.1515	2000	100.0	2000.0	0.9	914
pop. density (ordinal, linear)	0.0127	-0.0096	0.0356	2000	100.0	2000.0	1.7	914
pop. density (ordinal, quadratic)	-0.0120	-0.0301	0.0061	2000	100.0	2000.0	1.3	914
pop. density (ordinal, cubic)	-0.0043	-0.0154	0.0073	2000	100.0	2000.0	0.6	914
pop. density (ordinal, quartic)	-0.0025	-0.0081	0.0034	2000	100.0	1889.1	0.7	914
nu2	0.0005	0.0004	0.0006	2000	100.0	2000.0	1.0	914
tau2	0.0010	0.0007	0.0012	2000	100.0	2000.0	1.2	914
rho	0.6885	0.5427	0.8110	2000	43.3	2000.0	-0.1	914

Table A18: Predicting meetup RSVPs in 2012-2013: Model 2, Chain 3

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	-0.0155	-0.0628	0.0308	2000	100.0	2000.0	0.8	914
hh with Internet	-0.0124	-0.0640	0.0422	2000	100.0	2000.0	-0.4	914
pop. with degree	0.2847	0.1939	0.3722	2000	100.0	2319.8	-1.4	914
pop. unemployed	0.0730	-0.2576	0.4024	2000	100.0	2000.0	0.3	914
pop. homemaker	0.1746	0.0609	0.2860	2000	100.0	2000.0	-0.8	914
pop. over 65	0.0607	-0.0345	0.1582	2000	100.0	2000.0	0.0	914
pop. density (ordinal, linear)	0.0127	-0.0098	0.0344	2000	100.0	2000.0	0.8	914
pop. density (ordinal, quadratic)	-0.0120	-0.0305	0.0048	2000	100.0	2187.7	0.2	914
pop. density (ordinal, cubic)	-0.0043	-0.0150	0.0064	2000	100.0	2174.8	-0.6	914
pop. density (ordinal, quartic)	-0.0024	-0.0085	0.0037	2000	100.0	2000.0	-1.6	914
nu2	0.0005	0.0004	0.0006	2000	100.0	2000.0	2.4	914
tau2	0.0010	0.0007	0.0012	2000	100.0	1975.5	-1.4	914
rho	0.6864	0.5487	0.8141	2000	45.1	2186.7	-0.5	914

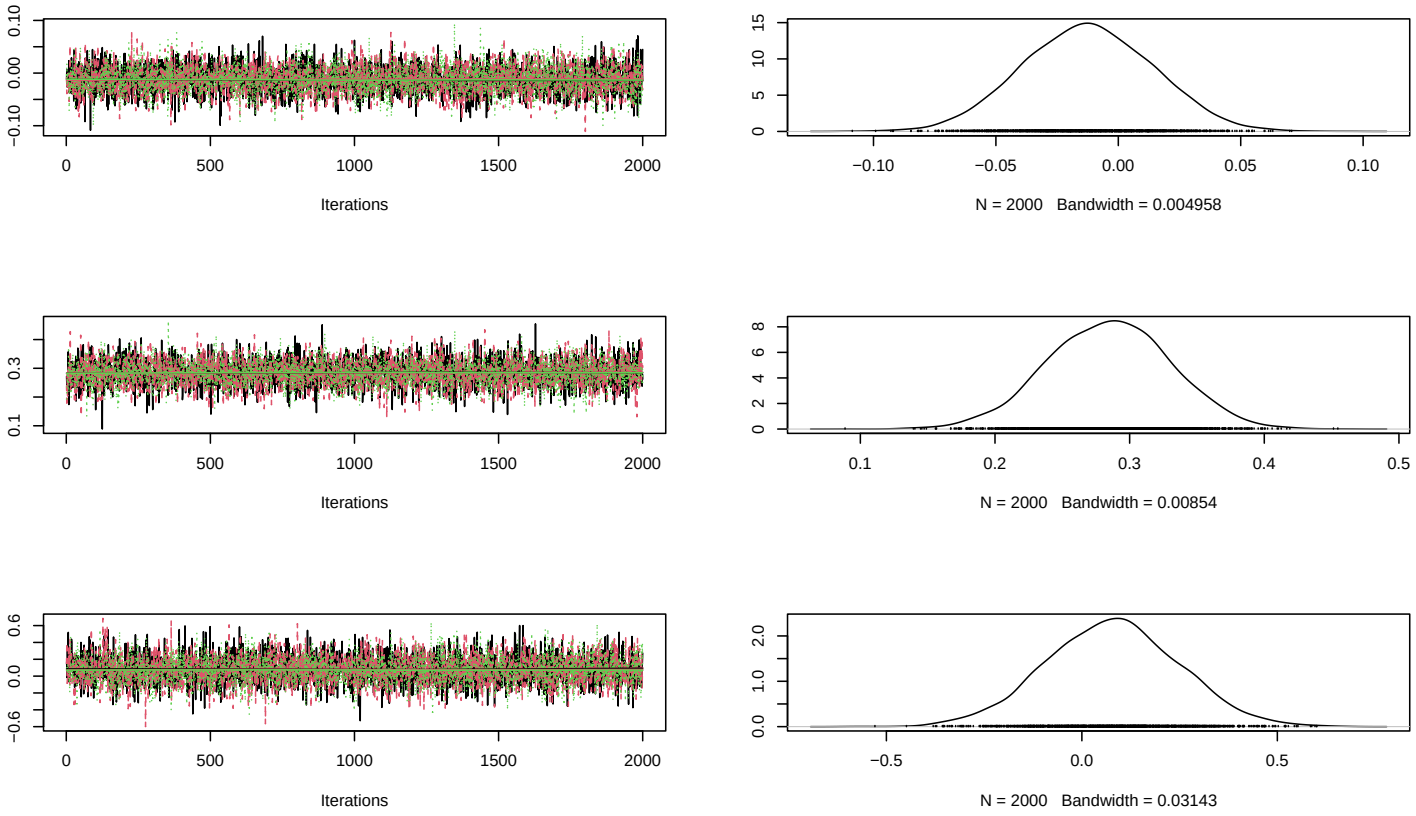


Figure A12: Predicting meetup RSVPs in 2012-2013: Model 2, Convergence of the three Markov chains

Table A19: Predicting meetup RSVPs in 2012-2013: Model 2, Potential scale reduction factor (multivariate PSRF: 1.002624)

Point est.	Upper C.I.
1.0016026	1.005101
1.0022322	1.006995
0.9998429	1.000368
1.0000682	1.001231
0.9998462	1.000533
1.0000469	1.001170
1.0007373	1.002972
1.0001334	1.001497
0.9999176	1.000794
1.0010578	1.003500

9.2.5 Predicting Meetup RSVPs Period 2 - Period 1: Model 1

Table A20: Predicting Meetup RSVPs Period 2 - Period 1 : Model 1, Chain 1

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	0.0877	0.0354	0.1382	2000	100.0	2187.3	-0.6	914
turnout 2006-08	-0.0722	-0.1436	-0.0044	2000	100.0	2000.0	1.2	914
staff not-for-profit ass. (sqrt)	-0.0248	-0.0743	0.0241	2000	100.0	2158.9	-0.2	914
hh with Internet	-0.0530	-0.1034	-0.0031	2000	100.0	2000.0	-0.8	914
pop. density (ordinal, linear)	-0.0147	-0.0370	0.0068	2000	100.0	2095.6	-0.1	914
pop. density (ordinal, quadratic)	-0.0150	-0.0335	0.0034	2000	100.0	2000.0	0.1	914
pop. density (ordinal, cubic)	-0.0024	-0.0137	0.0089	2000	100.0	2000.0	0.5	914
pop. density (ordinal, quartic)	-0.0044	-0.0104	0.0017	2000	100.0	2000.0	0.4	914
nu2	0.0005	0.0004	0.0007	2000	100.0	2000.0	1.1	914
tau2	0.0010	0.0007	0.0012	2000	100.0	2000.0	-1.1	914
rho	0.6207	0.4624	0.7793	2000	43.9	2000.0	0.0	914

Table A21: Predicting Meetup RSVPs Period 2 - Period 1: Model 1, Chain 2

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	0.0867	0.0330	0.1382	2000	100.0	2000.0	0.2	914
turnout 2006-08	-0.0716	-0.1461	0.0007	2000	100.0	2000.0	0.2	914
staff not-for-profit ass. (sqrt)	-0.0247	-0.0764	0.0251	2000	100.0	2000.0	0.0	914
hh with Internet	-0.0521	-0.1025	-0.0008	2000	100.0	2031.3	-0.5	914
pop. density (ordinal, linear)	-0.0148	-0.0378	0.0068	2000	100.0	1711.4	0.4	914
pop. density (ordinal, quadratic)	-0.0150	-0.0334	0.0032	2000	100.0	2000.0	0.1	914
pop. density (ordinal, cubic)	-0.0025	-0.0138	0.0089	2000	100.0	2000.0	-0.3	914
pop. density (ordinal, quartic)	-0.0046	-0.0107	0.0016	2000	100.0	2000.0	0.0	914
nu2	0.0005	0.0004	0.0007	2000	100.0	2000.0	-1.0	914
tau2	0.0010	0.0007	0.0012	2000	100.0	2000.0	2.1	914
rho	0.6196	0.4599	0.7805	2000	47.4	2000.0	-1.8	914

Table A22: Predicting Meetup RSVPs Period 2 - Period 1: Model 1, Chain 3

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	0.0865	0.0327	0.1384	2000	100.0	2000.0	0.8	914
turnout 2006-08	-0.0721	-0.1416	-0.0013	2000	100.0	2000.0	0.3	914
staff not-for-profit ass. (sqrt)	-0.0251	-0.0750	0.0243	2000	100.0	2000.0	-0.6	914
hh with Internet	-0.0510	-0.1026	-0.0021	2000	100.0	2000.0	-1.2	914
pop. density (ordinal, linear)	-0.0147	-0.0375	0.0081	2000	100.0	2162.9	1.9	914
pop. density (ordinal, quadratic)	-0.0150	-0.0334	0.0041	2000	100.0	2000.0	1.8	914
pop. density (ordinal, cubic)	-0.0025	-0.0133	0.0094	2000	100.0	2000.0	1.8	914
pop. density (ordinal, quartic)	-0.0044	-0.0106	0.0018	2000	100.0	2000.0	2.0	914
nu2	0.0005	0.0004	0.0007	2000	100.0	2000.0	1.0	914
tau2	0.0010	0.0007	0.0012	2000	100.0	2000.0	-0.7	914
rho	0.6210	0.4541	0.7695	2000	42.9	2000.0	0.1	914

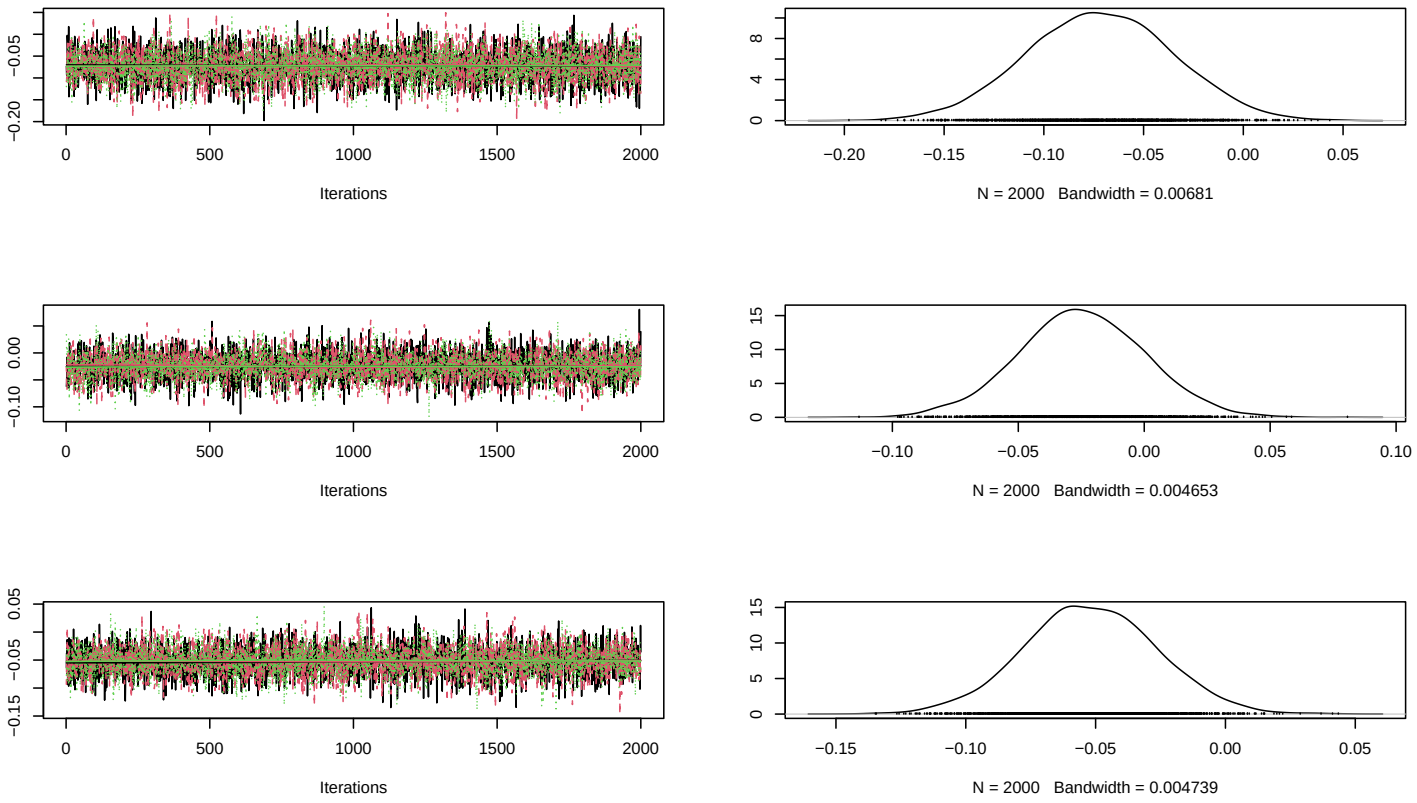


Figure A13: Predicting meetup RSVPs in 2012-2013: Model 1, Convergence of the three Markov chains

Table A23: Predicting Meetup RSVPs Period 2 - Period 1: Model 1, Potential scale reduction factor (multivariate PSRF: 1.002526)

Point est.	Upper C.I.
1.0002910	1.0014276
1.0004451	1.0020822
1.0000266	1.0003323
1.0002657	1.0010559
0.9998226	1.0005855
0.9996523	0.9997575
0.9996782	1.0001053
1.0004778	1.0027347

9.2.6 Predicting Meetup RSVPs Period 2 - Period 1: Model 2

Table A24: Predicting Meetup RSVPs Period 2 - Period 1: Model 2, Chain 1

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	-0.0021	-0.0493	0.0438	2000	100.0	2000.0	1.8	914
hh with Internet	-0.0344	-0.0860	0.0163	2000	100.0	2000.0	-1.8	914
pop. with degree	0.0279	-0.0669	0.1198	2000	100.0	2251.2	0.2	914
pop. unemployed	-0.0498	-0.3570	0.2560	2000	100.0	2000.0	0.2	914
pop. homemaker	0.2506	0.1391	0.3549	2000	100.0	2000.0	-0.8	914
pop. over 65	0.0054	-0.0926	0.1016	2000	100.0	2000.0	-0.8	914
pop. density (ordinal, linear)	-0.0184	-0.0427	0.0043	2000	100.0	2000.0	0.7	914
pop. density (ordinal, quadratic)	-0.0167	-0.0356	0.0012	2000	100.0	2000.0	0.5	914
pop. density (ordinal, cubic)	-0.0027	-0.0139	0.0089	2000	100.0	2000.0	0.3	914
pop. density (ordinal, quartic)	-0.0042	-0.0101	0.0020	2000	100.0	2000.0	0.1	914
nu2	0.0005	0.0004	0.0007	2000	100.0	1799.8	0.2	914
tau2	0.0009	0.0007	0.0012	2000	100.0	2000.0	0.6	914
rho	0.5761	0.4162	0.7289	2000	44.2	2000.0	0.1	914

Table A25: Predicting Meetup RSVPs Period 2 - Period 1: Model 2, Chain 2

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	-0.0014	-0.0487	0.0478	2000	100.0	2000.0	1.1	914
hh with Internet	-0.0357	-0.0884	0.0156	2000	100.0	2000.0	-1.0	914
pop. with degree	0.0285	-0.0592	0.1165	2000	100.0	2000.0	-0.5	914
pop. unemployed	-0.0557	-0.3594	0.2654	2000	100.0	2000.0	1.4	914
pop. homemaker	0.2522	0.1472	0.3606	2000	100.0	2000.0	-1.8	914
pop. over 65	0.0055	-0.0922	0.1004	2000	100.0	2000.0	0.0	914
pop. density (ordinal, linear)	-0.0189	-0.0424	0.0043	2000	100.0	2018.1	0.5	914
pop. density (ordinal, quadratic)	-0.0172	-0.0353	0.0010	2000	100.0	2000.0	0.2	914
pop. density (ordinal, cubic)	-0.0030	-0.0139	0.0082	2000	100.0	2000.0	-0.6	914
pop. density (ordinal, quartic)	-0.0044	-0.0101	0.0016	2000	100.0	2000.0	-0.2	914
nu2	0.0005	0.0004	0.0007	2000	100.0	2000.0	1.7	914
tau2	0.0009	0.0007	0.0012	2000	100.0	2000.0	-1.1	914
rho	0.5740	0.4072	0.7366	2000	45.2	2000.0	1.4	914

Table A26: Predicting Meetup RSVPs Period 2 - Period 1: Model 2, Chain 3

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	-0.0016	-0.0472	0.0446	2000	100.0	2268.4	-1.7	914
hh with Internet	-0.0356	-0.0857	0.0126	2000	100.0	2000.0	2.3	914
pop. with degree	0.0272	-0.0624	0.1211	2000	100.0	2000.0	0.4	914
pop. unemployed	-0.0511	-0.3582	0.2589	2000	100.0	2000.0	-0.4	914
pop. homemaker	0.2496	0.1434	0.3575	2000	100.0	2248.5	0.8	914
pop. over 65	0.0066	-0.0915	0.0972	2000	100.0	2000.0	-0.1	914
pop. density (ordinal, linear)	-0.0193	-0.0416	0.0041	2000	100.0	2000.0	-0.7	914
pop. density (ordinal, quadratic)	-0.0175	-0.0360	0.0009	2000	100.0	2000.0	-0.5	914
pop. density (ordinal, cubic)	-0.0033	-0.0151	0.0081	2000	100.0	2000.0	-0.6	914
pop. density (ordinal, quartic)	-0.0044	-0.0105	0.0018	2000	100.0	1781.9	-2.0	914
nu2	0.0005	0.0004	0.0007	2000	100.0	2160.5	0.5	914
tau2	0.0009	0.0007	0.0012	2000	100.0	2000.0	-0.4	914
rho	0.5723	0.4064	0.7289	2000	43.4	1484.7	0.9	914

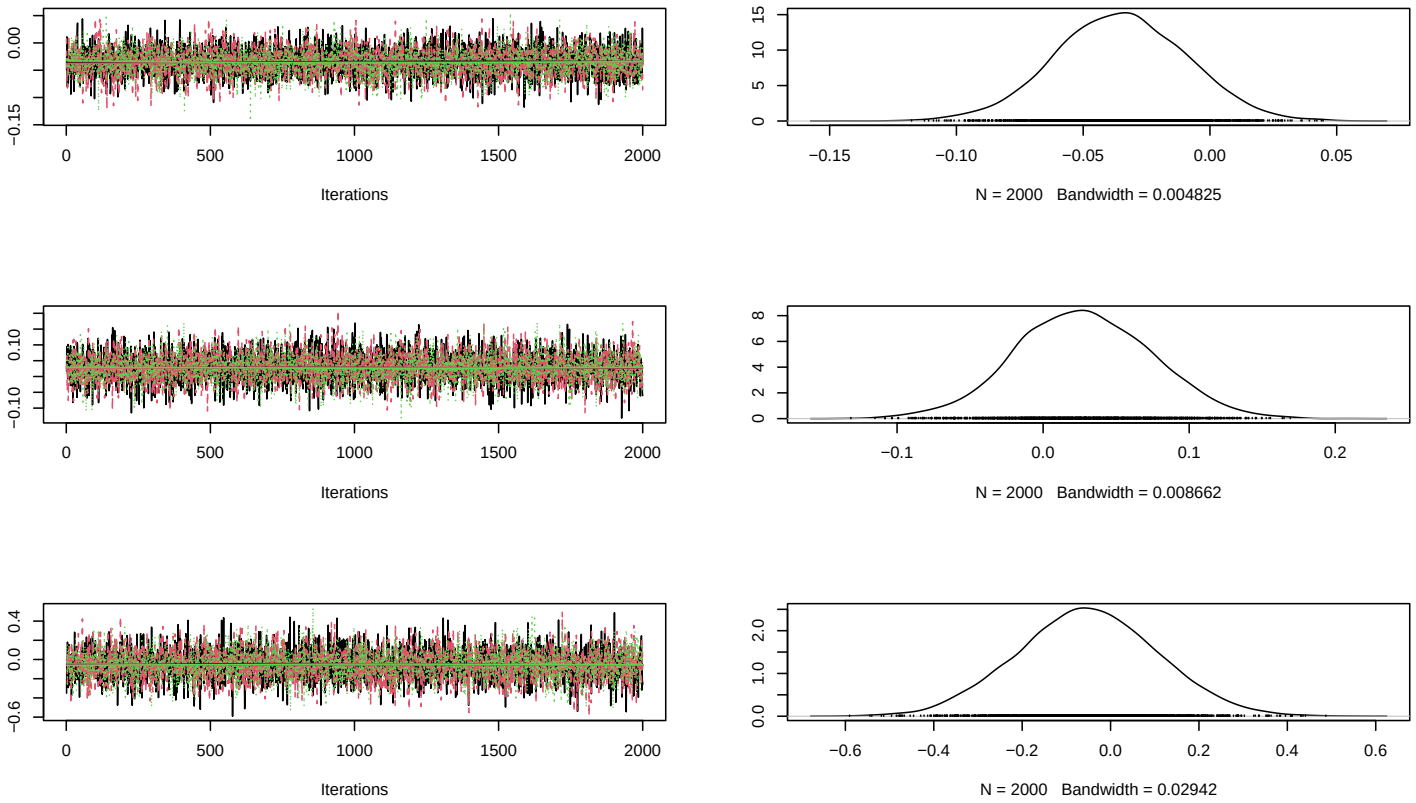


Figure A14: Predicting meetup RSVPs in 2012-2013: Model 2, Convergence of the three Markov chains

Table A27: Predicting Meetup RSVPs Period 2 - Period 1: Model 2, Potential scale reduction factor (multivariate PSRF: 1.00202)

Point est.	Upper C.I.
1.0000841	1.001090
1.0012088	1.004433
0.9998256	1.000225
1.0007822	1.002475
0.9998274	1.000631
0.9999021	1.000015
1.0000288	1.001243
1.0003009	1.002404
1.0003051	1.001988
1.0002412	1.000899

9.2.7 Predicting meetup RSVPs with 7-day rolling windows

Table A28: Means of coefficients and confidence interval boundaries predicting Meetup RVSPs (weekly count)

var	From	To	Mean coeffi-cient	Mean 2.5%	Mean 97.5%	Num.Obs.	Num.Sign. >0	Perc.Sign. >0	Num.Sign. <0	Perc.Sign. <0
(Intercept)	2005-07-28	2018-06-21	1.61	0.27	2.93	672	338	50.30	0	0.00
hh with Internet	2005-07-28	2018-06-21	0.17	-1.33	1.69	672	25	3.72	34	5.06
pop. density (ordinal, cubic)	2005-07-28	2018-06-21	1.24	0.85	1.64	672	600	89.29	9	1.34
pop. density (ordinal, linear)	2005-07-28	2018-06-21	4.70	3.97	5.44	672	654	97.32	0	0.00
pop. density (ordinal, quadratic)	2005-07-28	2018-06-21	2.81	2.19	3.43	672	639	95.09	0	0.00
pop. density (ordinal, quartic)	2005-07-28	2018-06-21	0.33	0.12	0.54	672	452	67.26	12	1.79
staff not-for-profit ass. (sqrt)	2005-07-28	2018-06-21	0.39	-0.99	1.79	672	76	11.31	0	0.00
turnout 2006-08	2005-07-28	2018-06-21	0.20	-1.69	2.09	672	32	4.76	2	0.30
(Intercept)	2007-08-16	2012-03-22	0.60	-0.18	1.38	241	86	35.68	0	0.00
hh with Internet	2007-08-16	2012-03-22	-0.10	-1.02	0.82	241	0	0.00	11	4.56
pop. density (ordinal, cubic)	2007-08-16	2012-03-22	0.94	0.67	1.21	241	201	83.40	4	1.66
pop. density (ordinal, linear)	2007-08-16	2012-03-22	3.15	2.65	3.66	241	236	97.93	0	0.00
pop. density (ordinal, quadratic)	2007-08-16	2012-03-22	2.09	1.66	2.51	241	226	93.78	0	0.00
pop. density (ordinal, quartic)	2007-08-16	2012-03-22	0.30	0.15	0.44	241	166	68.88	6	2.49
staff not-for-profit ass. (sqrt)	2007-08-16	2012-03-22	0.69	-0.21	1.58	241	54	22.41	0	0.00
turnout 2006-08	2007-08-16	2012-03-22	0.74	-0.49	1.98	241	30	12.45	0	0.00
(Intercept)	2012-03-29	2013-02-21	2.94	1.09	4.75	48	35	72.92	0	0.00
hh with Internet	2012-03-29	2013-02-21	-1.63	-3.80	0.55	48	0	0.00	16	33.33
pop. density (ordinal, cubic)	2012-03-29	2013-02-21	0.97	0.43	1.52	48	36	75.00	1	2.08
pop. density (ordinal, linear)	2012-03-29	2013-02-21	5.27	4.24	6.31	48	47	97.92	0	0.00
pop. density (ordinal, quadratic)	2012-03-29	2013-02-21	2.69	1.81	3.56	48	43	89.58	0	0.00
pop. density (ordinal, quartic)	2012-03-29	2013-02-21	0.19	-0.11	0.49	48	14	29.17	3	6.25
staff not-for-profit ass. (sqrt)	2012-03-29	2013-02-21	0.88	-1.06	2.82	48	2	4.17	0	0.00
turnout 2006-08	2012-03-29	2013-02-21	0.18	-2.48	2.87	48	1	2.08	1	2.08

9.2.8 Predicting M5S vote in 2013 with Meetup RSVPs Period 1 2007-12

Table A29: Predicting M5S vote in 2013 with Meetup RSVPs Period 1 2007-12, Chain 1

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	0.1467	0.1425	0.1507	2000	100.0	2000.0	-0.8	914
Meetup RSVPs Period 1 2007-12 (sqrt)	0.0004	-0.0008	0.0017	2000	100.0	2000.0	0.7	914
hh with Internet	0.0012	-0.0011	0.0035	2000	100.0	1754.6	1.0	914
pop. with degree	0.0025	0.0009	0.0042	2000	100.0	2000.0	-1.3	914
pop. unemployed	0.0030	0.0003	0.0058	2000	100.0	2207.3	-1.7	914
pop. homemaker	0.0003	-0.0027	0.0033	2000	100.0	1875.8	0.1	914
pop. over 65	-0.0064	-0.0084	-0.0043	2000	100.0	2000.0	0.6	914
pop. density (ordinal, linear)	-0.0067	-0.0197	0.0061	2000	100.0	2000.0	-0.8	914
pop. density (ordinal, quadratic)	-0.0065	-0.0167	0.0033	2000	100.0	2000.0	-1.0	914
pop. density (ordinal, cubic)	-0.0006	-0.0068	0.0057	2000	100.0	2000.0	-1.1	914
pop. density (ordinal, quartic)	-0.0026	-0.0060	0.0009	2000	100.0	2000.0	-2.0	914
nu2	0.0001	0.0001	0.0002	2000	100.0	2359.3	0.3	914
tau2	0.0005	0.0004	0.0006	2000	100.0	2000.0	0.4	914
rho	0.9797	0.9678	0.9889	2000	42.9	2000.0	0.4	914

Table A30: Predicting M5S vote in 2013 with Meetup RSVPs Period 1 2007-12, Chain 2

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	0.1466	0.1424	0.1508	2000	100.0	2000.0	1.6	914
Meetup RSVPs Period 1 2007-12 (sqrt)	0.0004	-0.0009	0.0017	2000	100.0	2000.0	2.5	914
hh with Internet	0.0012	-0.0011	0.0036	2000	100.0	2195.1	0.4	914
pop. with degree	0.0026	0.0008	0.0043	2000	100.0	2000.0	-1.9	914
pop. unemployed	0.0031	0.0003	0.0058	2000	100.0	2018.8	-1.7	914
pop. homemaker	0.0002	-0.0027	0.0032	2000	100.0	1856.4	-0.1	914
pop. over 65	-0.0064	-0.0085	-0.0044	2000	100.0	2000.0	0.5	914
pop. density (ordinal, linear)	-0.0070	-0.0202	0.0059	2000	100.0	2000.0	1.3	914
pop. density (ordinal, quadratic)	-0.0066	-0.0168	0.0040	2000	100.0	1684.8	1.2	914
pop. density (ordinal, cubic)	-0.0006	-0.0067	0.0058	2000	100.0	1731.9	0.7	914
pop. density (ordinal, quartic)	-0.0026	-0.0061	0.0009	2000	100.0	2000.0	0.8	914
nu2	0.0001	0.0001	0.0002	2000	100.0	2000.0	-0.7	914
tau2	0.0005	0.0004	0.0006	2000	100.0	2000.0	0.6	914
rho	0.9798	0.9677	0.9893	2000	45.6	2000.0	0.7	914

Table A31: Predicting M5S vote in 2013 with Meetup RSVPs Period 1 2007-12, Chain 3

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	0.1467	0.1423	0.1509	2000	100.0	2248.4	-0.4	914
Meetup RSVPs Period 1 2007-12 (sqrt)	0.0004	-0.0009	0.0018	2000	100.0	2000.0	-0.9	914
hh with Internet	0.0012	-0.0011	0.0035	2000	100.0	2000.0	1.4	914
pop. with degree	0.0025	0.0008	0.0043	2000	100.0	2000.0	0.3	914
pop. unemployed	0.0031	0.0002	0.0059	2000	100.0	1811.7	-0.5	914
pop. homemaker	0.0003	-0.0027	0.0034	2000	100.0	2000.0	0.8	914
pop. over 65	-0.0064	-0.0085	-0.0044	2000	100.0	2275.6	0.6	914
pop. density (ordinal, linear)	-0.0067	-0.0202	0.0065	2000	100.0	2206.3	-0.5	914
pop. density (ordinal, quadratic)	-0.0065	-0.0168	0.0037	2000	100.0	2201.5	-0.9	914
pop. density (ordinal, cubic)	-0.0006	-0.0070	0.0055	2000	100.0	2135.0	-1.5	914
pop. density (ordinal, quartic)	-0.0026	-0.0060	0.0008	2000	100.0	2159.4	-0.9	914
nu2	0.0001	0.0001	0.0002	2000	100.0	2000.0	-0.3	914
tau2	0.0005	0.0004	0.0006	2000	100.0	2000.0	-0.2	914
rho	0.9798	0.9672	0.9891	2000	43.8	1858.9	-0.8	914

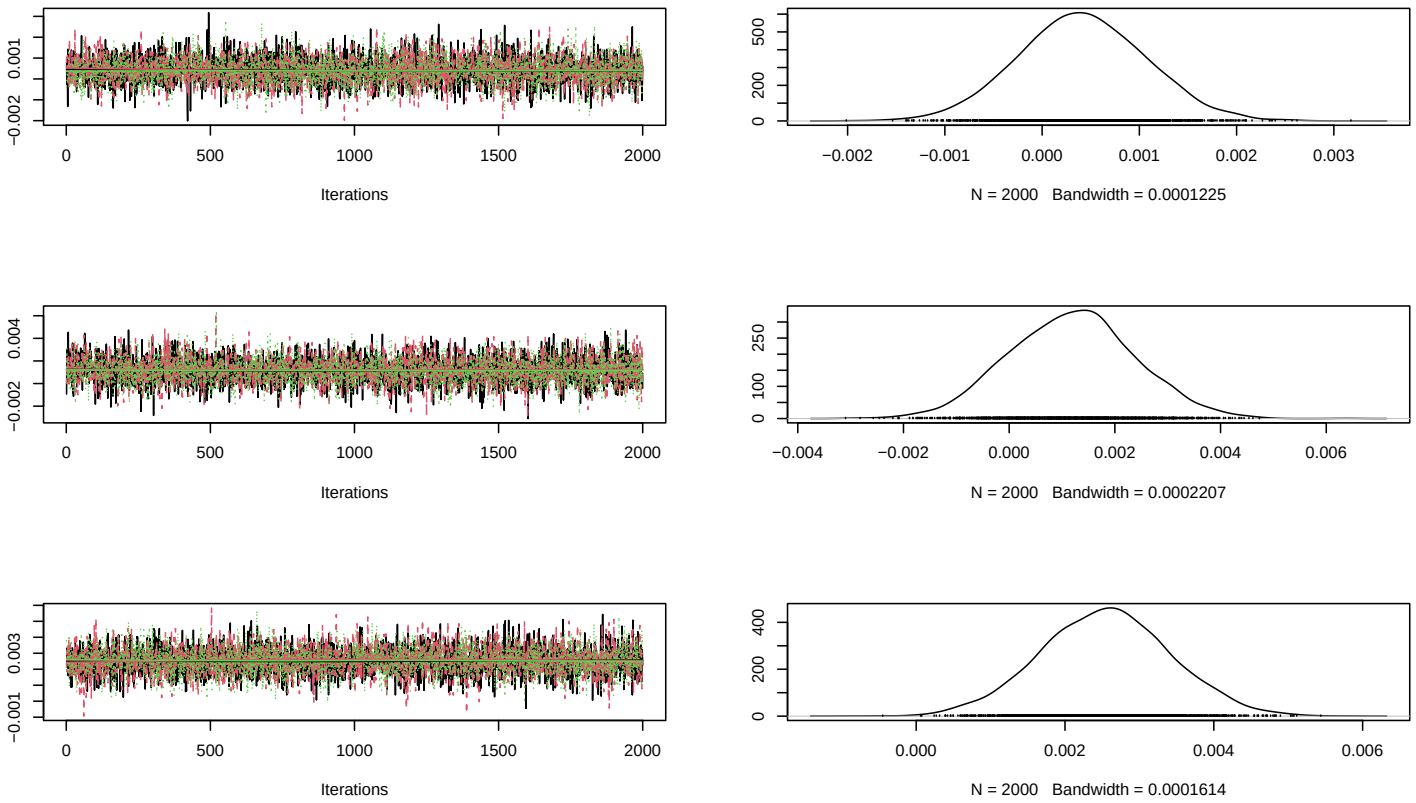


Figure A15: Predicting M5S vote in 2013 with Meetup RSVPs Period 1 2007-12, Convergence of the three Markov chains

Table A32: Predicting M5S vote in 2013 with Meetup RSVPs Period 1 2007-12, Potential scale reduction factor (multivariate PSRF: 1.005568)

Point est.	Upper C.I.
1.001443	1.005699
1.000397	1.001177
1.000030	1.001235
1.001077	1.003103
1.000778	1.003257
1.000867	1.003797
1.000633	1.003311
1.000691	1.003572
1.000267	1.001797
1.000787	1.002513
1.002662	1.010473

9.2.9 Predicting M5S vote in 2013 with Meetup RSVPs Period 2 2012-13

Table A33: Predicting M5S vote in 2013 with Meetup RSVPs Period 2 2012-13, Chain 1

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	0.1466	0.1425	0.1509	2000	100.0	2000	-0.7	914
Meetup RSVPs Period 2 2012-13 (sqrt)	0.0019	0.0005	0.0032	2000	100.0	2000	-1.2	914
hh with Internet	0.0013	-0.0010	0.0036	2000	100.0	2000	1.5	914
pop. with degree	0.0022	0.0005	0.0039	2000	100.0	2000	0.8	914
pop. unemployed	0.0028	0.0001	0.0058	2000	100.0	2000	-1.1	914
pop. homemaker	0.0001	-0.0028	0.0030	2000	100.0	2000	1.3	914
pop. over 65	-0.0066	-0.0086	-0.0046	2000	100.0	2000	-0.1	914
pop. density (ordinal, linear)	-0.0068	-0.0200	0.0065	2000	100.0	2000	-0.7	914
pop. density (ordinal, quadratic)	-0.0058	-0.0160	0.0042	2000	100.0	2000	-1.1	914
pop. density (ordinal, cubic)	-0.0003	-0.0065	0.0057	2000	100.0	2000	-1.3	914
pop. density (ordinal, quartic)	-0.0024	-0.0058	0.0011	2000	100.0	2000	0.1	914
nu2	0.0001	0.0001	0.0002	2000	100.0	2000	-1.3	914
tau2	0.0005	0.0004	0.0006	2000	100.0	2000	-0.7	914
rho	0.9799	0.9674	0.9895	2000	42.4	2000	0.2	914

Table A34: Predicting M5S vote in 2013 with Meetup RSVPs Period 2 2012-13, Chain 2

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	0.1466	0.1424	0.1508	2000	100.0	2000.0	-1.7	914
Meetup RSVPs Period 2 2012-13 (sqrt)	0.0019	0.0006	0.0032	2000	100.0	2000.0	-0.8	914
hh with Internet	0.0012	-0.0010	0.0036	2000	100.0	2000.0	-0.2	914
pop. with degree	0.0022	0.0006	0.0040	2000	100.0	2000.0	-0.6	914
pop. unemployed	0.0029	0.0001	0.0057	2000	100.0	2000.0	-0.5	914
pop. homemaker	0.0001	-0.0028	0.0030	2000	100.0	2000.0	0.1	914
pop. over 65	-0.0066	-0.0086	-0.0044	2000	100.0	1865.2	0.1	914
pop. density (ordinal, linear)	-0.0069	-0.0199	0.0061	2000	100.0	2000.0	-1.5	914
pop. density (ordinal, quadratic)	-0.0058	-0.0159	0.0044	2000	100.0	2187.9	-1.4	914
pop. density (ordinal, cubic)	-0.0003	-0.0063	0.0061	2000	100.0	2603.0	-1.7	914
pop. density (ordinal, quartic)	-0.0025	-0.0057	0.0008	2000	100.0	2145.6	-0.8	914
nu2	0.0001	0.0001	0.0002	2000	100.0	2000.0	0.4	914
tau2	0.0005	0.0004	0.0006	2000	100.0	2000.0	-0.7	914
rho	0.9799	0.9683	0.9891	2000	46.2	2019.8	0.4	914

Table A35: Predicting M5S vote in 2013 with Meetup RSVPs Period 2 2012-13, Chain 3

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	0.1467	0.1424	0.1509	2000	100.0	2000.0	1.9	914
Meetup RSVPs Period 2 2012-13 (sqrt)	0.0018	0.0005	0.0031	2000	100.0	2000.0	0.5	914
hh with Internet	0.0013	-0.0011	0.0036	2000	100.0	1838.6	-0.8	914
pop. with degree	0.0022	0.0006	0.0039	2000	100.0	2000.0	-0.5	914
pop. unemployed	0.0028	0.0001	0.0056	2000	100.0	1770.5	-0.6	914
pop. homemaker	0.0001	-0.0028	0.0031	2000	100.0	2000.0	-2.6	914
pop. over 65	-0.0066	-0.0087	-0.0045	2000	100.0	2135.5	0.3	914
pop. density (ordinal, linear)	-0.0068	-0.0202	0.0065	2000	100.0	2000.0	1.8	914
pop. density (ordinal, quadratic)	-0.0058	-0.0162	0.0043	2000	100.0	2000.0	1.3	914
pop. density (ordinal, cubic)	-0.0003	-0.0066	0.0059	2000	100.0	2000.0	1.4	914
pop. density (ordinal, quartic)	-0.0024	-0.0058	0.0010	2000	100.0	2000.0	0.1	914
nu2	0.0001	0.0001	0.0002	2000	100.0	2056.1	1.7	914
tau2	0.0005	0.0004	0.0006	2000	100.0	2000.0	-2.1	914
rho	0.9799	0.9674	0.9891	2000	44.1	2000.0	1.3	914

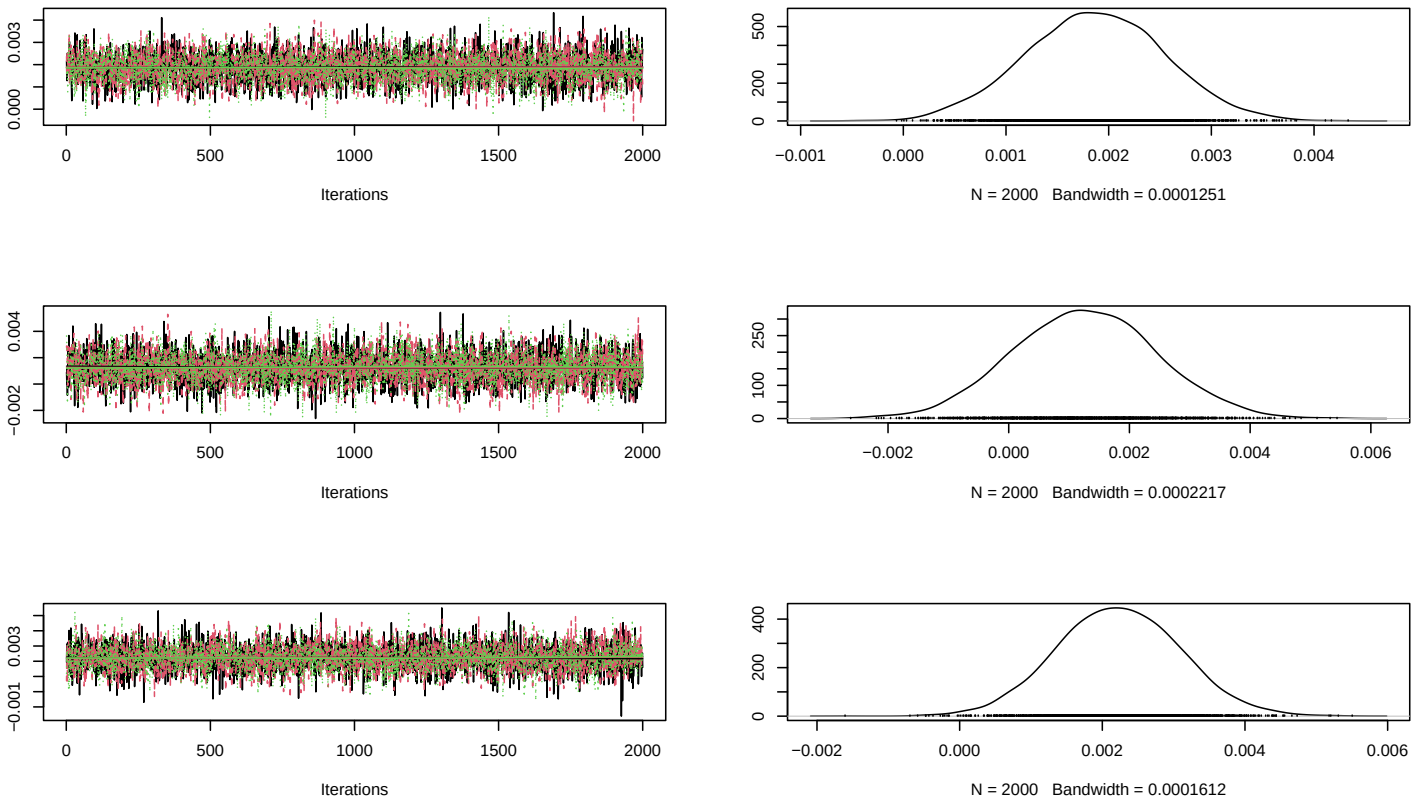


Figure A16: Predicting M5S vote in 2013 with Meetup RSVPs Period 2 2012-13, Convergence of the three Markov chains

Table A36: Predicting M5S vote in 2013 with Meetup RSVPs Period 2 2012-13, Potential scale reduction factor (multivariate PSRF: 1.004316)

Point est.	Upper C.I.
0.9999732	1.001037
1.0018881	1.007971
1.0005864	1.003145
0.9999264	1.000771
1.0008088	1.003543
1.0002590	1.001793
0.9998629	1.000076
1.0000278	1.001078
1.0003897	1.002351
1.0004054	1.002270
0.9999744	1.000239

9.2.10 Predicting M5S vote in 2013 with Meetup RSVPs Period 2 - Period 1

Table A37: Predicting M5S vote in 2013 with Meetup RSVPs Period 2 - Period 1, Chain 1

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	0.1476	0.1435	0.1518	2000	100	2145.3	1.0	914
Meetup RSVPs Period 2 (sqrt) - Period 1 (sqrt)	0.0015	0.0001	0.0027	2000	100	2000.0	0.0	914
hh with Internet	0.0012	-0.0011	0.0037	2000	100	2000.0	0.0	914
pop. with degree	0.0027	0.0010	0.0045	2000	100	2000.0	-0.6	914
pop. unemployed	0.0032	0.0004	0.0060	2000	100	2000.0	-0.2	914
pop. homemaker	0.0000	-0.0030	0.0031	2000	100	2000.0	-2.2	914
pop. over 65	-0.0064	-0.0084	-0.0042	2000	100	2000.0	-0.3	914
pop. density (ordinal, linear)	-0.0039	-0.0171	0.0097	2000	100	2000.0	1.1	914
pop. density (ordinal, quadratic)	-0.0039	-0.0140	0.0065	2000	100	2216.8	0.7	914
pop. density (ordinal, cubic)	0.0005	-0.0058	0.0068	2000	100	2000.0	0.5	914
pop. density (ordinal, quartic)	-0.0020	-0.0054	0.0013	2000	100	2232.0	0.9	914
nu2	0.0001	0.0001	0.0002	2000	100	2000.0	0.4	914
tau2	0.0005	0.0004	0.0006	2000	100	2000.0	0.6	914
rho	0.9800	0.9688	0.9895	2000	46	2000.0	-2.4	914

Table A38: Predicting M5S vote in 2013 with Meetup RSVPs Period 2 - Period 1, Chain 2

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	0.1475	0.1434	0.1517	2000	100.0	2000.0	-1.4	914
Meetup RSVPs Period 2 (sqrt) - Period 1 (sqrt)	0.0015	0.0001	0.0028	2000	100.0	2000.0	1.0	914
hh with Internet	0.0013	-0.0011	0.0034	2000	100.0	1857.9	1.1	914
pop. with degree	0.0028	0.0010	0.0044	2000	100.0	2000.0	2.5	914
pop. unemployed	0.0032	0.0005	0.0061	2000	100.0	2000.0	0.5	914
pop. homemaker	0.0000	-0.0029	0.0028	2000	100.0	2000.0	0.6	914
pop. over 65	-0.0063	-0.0084	-0.0042	2000	100.0	1623.2	-0.8	914
pop. density (ordinal, linear)	-0.0041	-0.0171	0.0092	2000	100.0	2000.0	-1.4	914
pop. density (ordinal, quadratic)	-0.0040	-0.0144	0.0062	2000	100.0	2000.0	-1.0	914
pop. density (ordinal, cubic)	0.0005	-0.0058	0.0063	2000	100.0	2000.0	-0.9	914
pop. density (ordinal, quartic)	-0.0020	-0.0055	0.0012	2000	100.0	2140.2	-1.6	914
nu2	0.0001	0.0001	0.0002	2000	100.0	2000.0	0.4	914
tau2	0.0005	0.0004	0.0006	2000	100.0	2167.5	-0.4	914
rho	0.9802	0.9685	0.9894	2000	46.4	2000.0	2.5	914

Table A39: Predicting M5S vote in 2013 with Meetup RSVPs Period 2 - Period 1, Chain 3

	Mean	2.5%	97.5%	n.sample	% accept	n.effective	Geweke.diag	Num.Obs.
(Intercept)	0.1476	0.1434	0.1517	2000	100.0	1574.2	2.8	914
Meetup RSVPs Period 2 (sqrt) - Period 1 (sqrt)	0.0015	0.0002	0.0028	2000	100.0	2000.0	0.9	914
hh with Internet	0.0012	-0.0011	0.0036	2000	100.0	2000.0	0.4	914
pop. with degree	0.0028	0.0011	0.0045	2000	100.0	2000.0	-1.9	914
pop. unemployed	0.0032	0.0006	0.0060	2000	100.0	2000.0	0.1	914
pop. homemaker	0.0000	-0.0029	0.0029	2000	100.0	2000.0	0.4	914
pop. over 65	-0.0064	-0.0085	-0.0043	2000	100.0	2000.0	0.1	914
pop. density (ordinal, linear)	-0.0039	-0.0168	0.0090	2000	100.0	1613.5	2.9	914
pop. density (ordinal, quadratic)	-0.0038	-0.0139	0.0063	2000	100.0	2000.0	3.0	914
pop. density (ordinal, cubic)	0.0006	-0.0054	0.0069	2000	100.0	2000.0	3.1	914
pop. density (ordinal, quartic)	-0.0020	-0.0053	0.0016	2000	100.0	2000.0	2.4	914
nu2	0.0001	0.0001	0.0002	2000	100.0	2000.0	-0.9	914
tau2	0.0005	0.0004	0.0006	2000	100.0	2000.0	0.4	914
rho	0.9801	0.9680	0.9892	2000	46.9	2000.0	-0.7	914

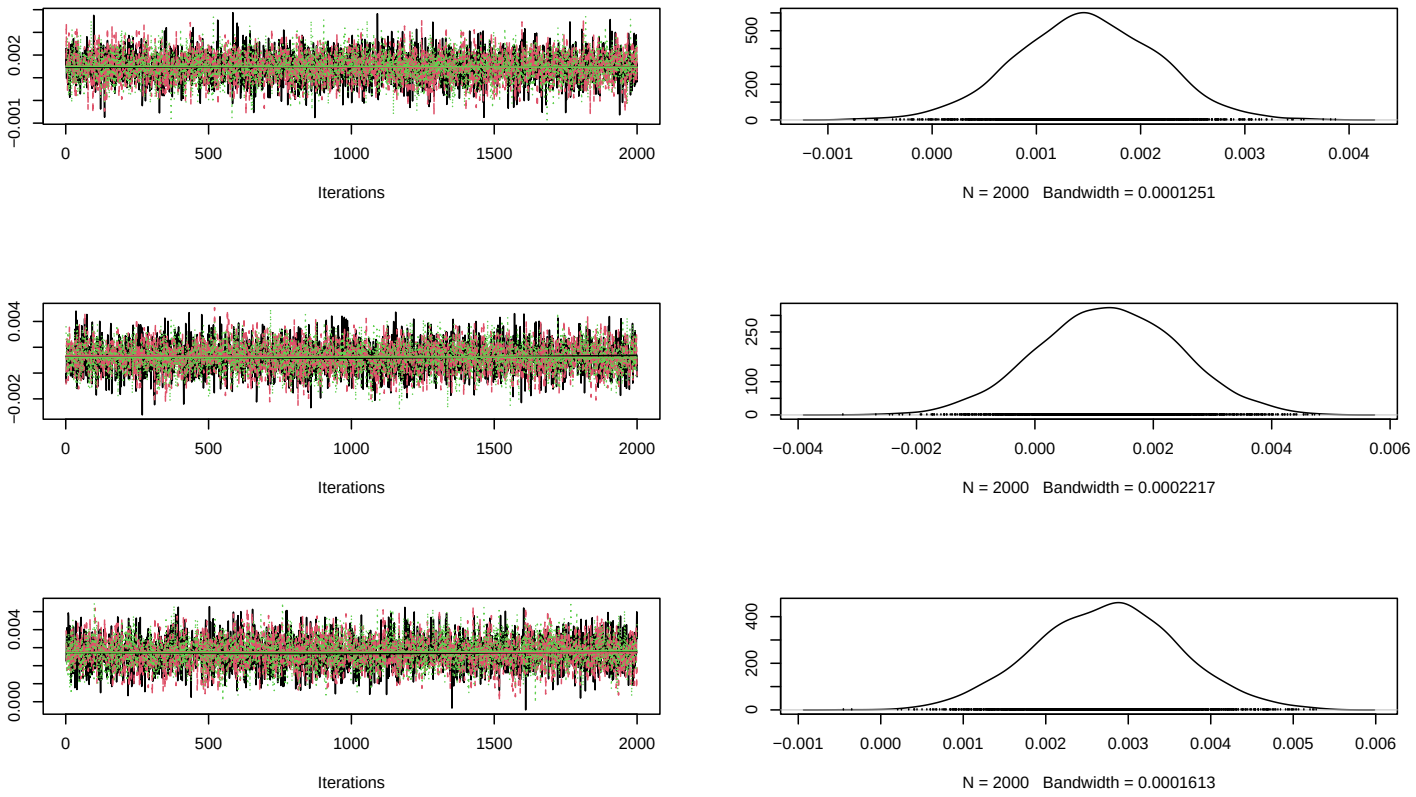


Figure A17: Predicting M5S vote in 2013 with Meetup RSVPs Period 2 - Period 1, Convergence of the three Markov chains

Table A40: Predicting M5S vote in 2013 with Meetup RSVPs Period 2 - Period 1, Potential scale reduction factor (multivariate PSRF: 1.001716)

Point est.	Upper C.I.
1.0000808	1.0008035
0.9997858	1.0004740
1.0000493	1.0001699
1.0015882	1.0060958
0.9998836	1.0003871
1.0005331	1.0028308
0.9998065	0.9998543
0.9999825	1.0006492
0.9996496	0.9996504
1.0000552	1.0001488
1.0000210	1.0007952

10 Survey responses: confidence intervals and regression models

I specified three models to conduct the analysis at the individual level based on survey responses collected during the 2013 election study:[2]

1. A model to predict political discontent with external political efficacy among the independent variables.
2. A model to predict internal political efficacy with the difference in meetup activity between the two periods among the independent variables.
3. A model to predict the M5S vote with an interaction term including political discontent and internal political efficacy.

All independent continuous variables have been scaled to facilitate the visual interpretation of the coefficients.

[2]Associazione Itanes. 2013. "Italian National Election Studies." 2013. http://www.itanes.org/dati/

10.1 Variables

Table A41: Survey questions and coding of variables

variable	question
age	D1. Could you please tell me your age? [numerical]
education	STU. What's your level of education? [numerical]
municipality size	[inferred] size of the municipality of residence
freq. political talks	D28. How often have you discussed political matters during the last two months? [numerical]
ext. political efficacy	NOSAY + NOCARE + DISTANCE + COMPLEXITY [numerical]
NOSAY	D38_1. People like me don't have any say in what the government does (what degree they are true, in your opinion?) [numerical]
NOCARE	D38_4. Parties are only interested in people's votes, but not in their opinions (what degree they are true, in your opinion?) [numerical]
DISTANCE	D38_3. Usually, people we elect to the Parliament quickly lose touch with the people (what degree they are true, in your opinion?) [numerical]
COMPLEXITY	D38_2. Sometimes politics and government seem so complicated that a person like me can't really understand what's going on (what degree they are true, in your opinion?) [numerical]
political interest	D27: In general, are you interested in politics? [numerical]
political participation	D78. I am now going to read a list of different associations. For each of them, please tell me whether you are a member and/or participate in their activities. 1. Voluntary associations + 2. Religious associations; 3. Sports associations + 4. Cultural associations + 5. Environmental associations + 6. Third-world and human rights associations + 7. Worker unions/trade associations + 8. Movements or political parties [numerical]
discontent	D15. I am going to read you a list of institutions. Can you tell me how much confidence you have in them: none at all, not very much, a fair amount or a great deal? D15_1. The Parliament + D15_2. The Political Parties [numerical]
voted M5S in 2013	D90. Can you tell me which party you voted for on the Chamber of Deputies ballot? [binary]
sex	[not asked, inferred, binary]
member of association	D78. I am now going to read a list of different associations. For each of them, please tell me whether you are a member and/or participate in their activities. 1. Voluntary associations OR 5. Environmental associations OR 6. Third-world and human rights associationss OR 8. Movements or political parties [binary]

10.2 Model summaries

Notes to Table A42:

- LM, mod. 1 and mod. 2 are not described in the paper.
- In LM, mod. 2 the external political efficacy index is replaced by its four components.

Notes to Table A43:

- LME, Mod. 1 (*) is described in the paper.
- LME, mod. 1-6 are linear mixed-effects models with fixed mean random intercepts and municipality as the grouping factor `g` (with formula `(1 | g)`).
- LM, mod. 1-2 are simple linear models (with no hierarchical structure).
- LME, mod. 1-3 and LM mod. 1 exclude from the analysis respondents from the metropolitan municipalities of Rome, Milan and Naples.

Notes to Table A44:

- BIN mod. 2 (*) is described in the paper.

Table A42: Linear regression models predicting political discontent using survey responses

	LM	
	mod. 1	mod. 2
age	−0.069**	−0.065*
	(0.026)	(0.026)
education	−0.058*	−0.060*
	(0.029)	(0.028)
municipality size	0.005	−0.001
	(0.025)	(0.024)
ext. political efficacy	−0.327***	
	(0.025)	
NOSAY		−0.043
		(0.028)
NOCARE		−0.259***
		(0.030)
DISTANCE		−0.126***
		(0.030)
COMPLEXITY		−0.010
		(0.027)
political interest	−0.069*	−0.086**
	(0.029)	(0.028)
political participation	−0.011	−0.016
	(0.029)	(0.028)
sex: Female	0.073	0.087+
	(0.050)	(0.050)
member of association	−0.088	−0.074
	(0.071)	(0.070)
Num.Obs.	1414	1414
R2	0.148	0.177
RMSE	0.92	0.90

+ p \num{< 0.1}, * p \num{< 0.05}, ** p \num{< 0.01}, *** p \num{< 0.001}

Table A43: Linear regression models predicting freq. of political talks using survey responses

	LME						LM	
	mod. 1 (*)	mod. 2	mod. 3	mod. 4	mod. 5	mod. 6	mod. 1	mod. 2
Meetup RSVPs Period 1		−0.066*			−0.062*			
		(0.032)			(0.031)			
Meetup RSVPs Period 2			0.025			0.026		
			(0.034)			(0.033)		
Meetup RSVPs Period 2 (sqrt) - Period 1 (sqrt)	0.096**			0.094**			0.095***	0.092***
	(0.030)			(0.030)			(0.021)	(0.021)
age	0.048*	0.046*	0.047*	0.062**	0.060**	0.061**	0.051*	0.050*
	(0.023)	(0.023)	(0.023)	(0.022)	(0.022)	(0.022)	(0.023)	(0.022)
education	0.094***	0.092***	0.094***	0.094***	0.092***	0.093***	0.085***	0.072**
	(0.024)	(0.024)	(0.024)	(0.023)	(0.023)	(0.023)	(0.025)	(0.024)
municipality size	0.000	−0.035	−0.014	−0.006	−0.042	−0.019	0.004	0.002
	(0.034)	(0.035)	(0.036)	(0.033)	(0.034)	(0.035)	(0.023)	(0.021)
political interest	0.494***	0.494***	0.491***	0.470***	0.469***	0.467***	0.509***	0.486***
	(0.024)	(0.024)	(0.024)	(0.023)	(0.023)	(0.023)	(0.024)	(0.024)
political participation	0.140***	0.140***	0.140***	0.161***	0.161***	0.161***	0.149***	0.160***
	(0.025)	(0.025)	(0.025)	(0.024)	(0.024)	(0.024)	(0.025)	(0.024)
sex: Female	−0.041	−0.040	−0.043	−0.029	−0.029	−0.031	−0.043	−0.028
	(0.040)	(0.040)	(0.040)	(0.039)	(0.039)	(0.039)	(0.043)	(0.042)
member of association	0.108+	0.109+	0.106+	0.102+	0.102+	0.099+	0.128*	0.122*
	(0.059)	(0.059)	(0.059)	(0.057)	(0.057)	(0.057)	(0.061)	(0.060)
Num.Obs.	1382	1382	1382	1502	1502	1502	1382	1502
R2							0.396	0.378
R2 Marg.	0.379	0.374	0.372	0.370	0.366	0.364		
R2 Cond.	0.476	0.476	0.478	0.467	0.467	0.469		
RMSE	0.69	0.69	0.69	0.70	0.70	0.70	0.78	0.79

+ p \num{< 0.1}, * p \num{< 0.05}, ** p \num{< 0.01}, *** p \num{< 0.001}

Table A44: Binomial (logit) regression models predicting M5S vote using survey responses

	BIN (logit)	
	mod. 1	mod. 2 (*)
age	−0.443***	−0.428***
	(0.085)	(0.084)
education	0.121	0.108
	(0.086)	(0.084)
municipality size	0.174*	0.158*
	(0.077)	(0.075)
freq. political talks	0.194*	0.065
	(0.095)	(0.098)
NOSAY	−0.016	
	(0.089)	
NOCARE	0.027	
	(0.101)	
DISTANCE	−0.057	
	(0.100)	
COMPLEXITY	−0.199*	
	(0.089)	
political interest	0.174+	0.216*
	(0.101)	(0.098)
political participation	0.117	0.127
	(0.084)	(0.084)
discontent	0.384***	0.394***
	(0.092)	(0.084)
sex: Female	0.113	0.186
	(0.156)	(0.154)
member of association	−0.393+	−0.361
	(0.230)	(0.226)
freq. political talks X discontent		0.298***
		(0.084)
Num.Obs.	1412	1465
RMSE	0.35	0.35

+ p \num{< 0.1}, * p \num{< 0.05}, ** p \num{< 0.01}, *** p \num{< 0.001}