ONLINE APPENDIX

A. Descriptive Statistics

Table A1. California City Elections Descriptive Statistics

Type	Percent of Sample
Presidential Timing	47.1%
Midterm Timing	30.2%
Primary Timing	5.8%
Off-Cycle Timing	16.8%
Average Number of Local Races	1.75
Average Number of Candidates per Race	4.4
Average Margin of Victory	7.8%
Mayoral Race on the Ballot	27.0%

B. Addressing Errors in Racial Classifications

Our main analysis relies on Catalist estimates of voter race. Generated with a proprietary model that uses voter names and geographic locations to predict racial identity, they may be estimated with some error. Existing studies suggest that the Catalist estimates are relatively precise, correctly classifying 99% of white voters, 97% of Black voters, 80% of Latinos, for an overall accuracy of 90% (Fraga 2016). A validation study conducted by Catalist using official records from southern states that ask voters to identify their race on the voter registration forms found similar results. Nevertheless, it is worth investigating how much racial misclassification could impact our results.

Ideally, we would adjust the Catalist estimates for potential misclassifications directly. Unfortunately, we do not have all of the necessary parameters to implement such adjustments with precision. For example, although we know the percent of white voters who are correctly classified as white, we do not know what percent of those who are misclassified are mistakenly labeled as Black vs. Latino vs. Asian.

Given the superior performance of the Catalist algorithm in correctly classifying white voters compared to racial minorities, our correction focuses on fixing the "false negatives" in the latter group. Specifically, we assume that that minority voters may be misclassified as being white, but that no white voters are incorrectly flagged as nonwhite. Second, we use the information provided in the Catalist technical documentation (which is more conservative than Fraga's estimates) to "back out" the number of minority voters incorrectly predicted to be white and subtract them from our counts.

Consider the following example. Suppose we observe a city with 200 voters, 116 of whom are coded as white in the Catalist data and 84 of whom are coded as Black. Using the uncorrected Catalist data, we would calculate that the white share of the electorate is 58 percent (116 white voters divided by 200 voters total). To implement our correction, we assume that all 84 Black voters are correctly classified. Second, we use the Catalist validation records, which show an 84 percent correct classification rate among Blacks, and assume that the remaining 16 percent of Black voters are all incorrectly classified as being white. In our simple example, this implies that 16 voters coded as white in the Catalist data are actually African-Americans, so we manually subtract 16 from our white total and add it to our African American total. With this correction, our updated data would now show that the white share of the electorate is only 50 percent (100 white voters divided 200 voters total). When we re-run the analysis with these adjusted estimates, our overall findings remain the same. We once again find that moving to on-cycle elections greatly reduces the share of voters who are classified as white and increases the share of Latino and Asian American. Table A2 displays the results using the adjusted race estimates.

Table A2. Election Timing and the Racial Composition of Voters – Using Adjusted Estimates of Voter Race

	White Share of Voters	Hispanic Share of Voters	Asian Share of Voters	Black Share of Voters
Presidential	-12.30***	5.554***	1.824***	0.660
	(2.641)	(1.602)	(0.668)	(0.559)
Midterm	-7.016***	2.238	1.135*	0.517
	(2.568)	(1.560)	(0.657)	(0.542)
Primary	-6.049**	1.514	2.042	-0.213
	(2.588)	(1.497)	(1.278)	(0.656)
Logged Population	-7.308**	3.271*	-0.425	1.868*
	(2.912)	(1.854)	(0.860)	(1.072)
Over 65	0.708	-10.42	4.594	14.25
	(20.77)	(13.96)	(10.43)	(11.62)
College Degree	0.462	-9.564	3.435	6.756
	(14.96)	(9.075)	(6.456)	(8.764)
Black CVAP	-23.21	16.13	-10.65	12.39
	(18.78)	(17.74)	(6.512)	(11.55)
API CVAP	-82.01***	22.37*	28.78***	-4.850
	(19.06)	(11.65)	(10.42)	(11.58)
Hispanic CVAP	-49.76***	25.12***	-1.331	4.024
	(8.494)	(5.226)	(1.818)	(2.719)
Median Income	-6.30e-05	9.42e-07	6.76e-06	-2.95e-05
	(8.91e-05)	(5.48e-05)	(3.76e-05)	(4.47e-05)
Total Races	0.0449	0.104	-0.136	0.0559
	(0.260)	(0.155)	(0.104)	(0.0888)
Mayor	-1.671**	0.688	0.0654	0.123
	(0.800)	(0.530)	(0.170)	(0.133)
Candidates in Race	0.0505	-0.0723	-0.0136	0.0312
	(0.0962)	(0.0669)	(0.0564)	(0.0257)
Margin of Victory	0.0237	-0.121	0.394	-0.587
	(2.403)	(1.935)	(0.879)	(0.699)
Off-cycle DV Mean	62.142	15.212	5.811	3.175
Observations	1,856	1,856	1,856	1,856
R-squared	0.287	0.172	0.040	0.012
Number of Cities	460	460	460	460

Robust standard errors clustered by city in parentheses
*** p<0.01, ** p<0.05, * p<0.1

C. Modeling Voter Partisanship and Ideology

The measure of partisanship we use is based on the proprietary Catalist Partisanship Model, which provides voters in the firm's database with a score indicating his or her probability of identifying as a Democrat rather than a Republican. These predicted probabilities come from a two-layer model that uses machine-learning algorithms trained on a large national sample — five million people from 31 states — of registered voters, using their declared partisanship in the voter file, as well as self-reported partisanship from public opinion polls. As inputs, the model relies on more than 150 separate variables, including gender, race, ethnicity, income, housing and family structure, past electoral returns, occupation, religious adherence, and economic conditions.

The Catalist Ideology Model is constructed similarly, using thermometer ratings from questions that appeared in national polls fielded by the AFL-CIO polling consortium as the training set. The issues included same-sex marriage, immigration, attitudes toward the NRA and Tea Party, as well as other standard policy questions. Answers to these questions were aggregated into a single index of "progressivism" that provided the dependent variable for the model. Both models were revalidated against new polling data in 2015, several years after their initial development.

Using these predicted probabilities, we created city-level crosstabs for each election date. A hypothetical example for one city is presented in Table A3. Each crosstab contains the number of voters (*N)* in each 5-percentage point probability bin, which is listed in the first column in the table. The hypothetical city depicted in the table contains a total of 2,000 voters, who are uniformly distributed across all probability bins. As a first step, we took the midpoint of each probability range, presented in the column labeled p. To calculate the expected number of Democrats in each city, we then multiplied each cell count in the N column by the midpoint of the probability range ($p * N$) and took the sum. In this case, our measure would indicate that 1,000 of the 2,000 voters are predicted to be Democrats, for an expected share of 50 percent.

Table A3: Catalist Partisanship Calculation Example

Pr(Democrat)	N	Probability Range Midpoint (p)	Democrats ($p * N$)
0-0.05	100	2.50	2.5
0.05-0.10	100	0.075	7.5
0.10-0.15	100	0.125	12.5
0.15-0.20	100	0.175	17.5
0.20-0.25	100	0.225	22.5
0.25-0.30	100	0.275	27.5
0.30-0.35	100	0.325	32.5
0.35-0.40	100	0.375	37.5
0.40-0.45	100	0.425	42.5
0.45-0.50	100	0.475	47.5
0.50-0.55	100	0.525	52.5
0.55-0.60	100	0.575	57.5
0.60-0.65	100	0.625	62.5
0.65-0.70	100	0.675	67.5
0.70-0.75	100	0.725	72.5
0.75-0.80	100	0.775	77.5
0.80-0.85	100	0.825	82.5
0.85-0.90	100	0.875	87.5
0.90-0.95	100	0.925	92.5
0.95-1	100	0.975	97.5
Total	**2000**		**1000**

D. Validating the Catalist Turnout Data

To evaluate the degree of measurement error in the Catalist-provided variables, we conducted a validation exercise for one compositional measure — voter partisanship — for which the "ground truth" is known. Specifically, we used Catalist partisanship estimates to calculate the share of Democrats among individuals who are recorded as having voted in each city during the 2008, 2012, and 2016 presidential elections. We then compared these estimates to the official city-level election results reported in the Supplemental Statement of the Vote by the California Secretary of State. Overall, the Catalist partisanship estimates track the official election returns almost perfectly, with the correlation ranging from 0.96 to 0.99. Strikingly, the relationship is just as strong in 2008 as in 2016, suggesting that voter migration does not pose a serious problem to our analysis.

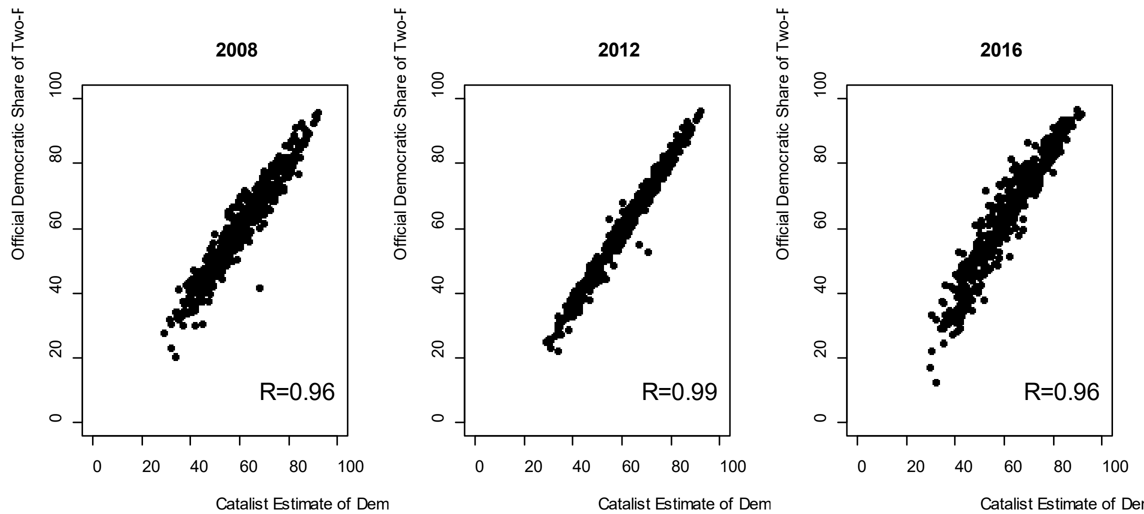

Figure A1. Validating Catalist Partisanship Measures Against Official Presidential Election Results

E. The Effect of Election Timing on Voter Composition: Including All Elections and Incorporating Both City and Year Fixed Effects

The regression tables in the body of the manuscript presents estimates of the effects of election timing while limiting the sample to election dates on which at least one local contest appeared on the ballot. That specification exploits variation in local election timing within cities over time. Here, we employ an alternate specification that includes all available election dates — including all statewide primary, midterm, and presidential elections — regardless of whether any local contests took place at the same time. This allows us to leverage data from all cities that have off-cycle elections, including those that don't vary the timing during the course of panel, since we can still compare voter composition during these local elections to the electorate observed in the same cities during statewide elections even if no local races appeared on the ballot then. In this alternative specification, we also add calendar year fixed effects to account for any secular trends in turnout over time.

The results largely corroborate the findings in the text. One difference is that this alternate analysis finds a small and significant effect of timing on the Black share of voters, while our analysis in the main text revealed no significant differences in Black voter share between on- and off-cycle contests. The effect in Table A4 is small — the Black share of the electorate is estimated to increase by 1.3 percentage points during midterms and by 1.2 percentage points during presidential elections — suggesting that on-cycle elections may marginally increase the voice of the African American electorate. Finally, the effects of election timing on the partisan and ideological composition of the electorate are somewhat smaller and less precisely estimated compared to the main analysis.

Table A4. Election Timing and the Racial Composition of Voters

	White Share of Voters	Black Share of Voters	Hispanic Share of Voters	Asian Share of Voters
Presidential	-10.28***	1.262***	6.708***	1.784***
	(1.973)	(0.468)	(1.632)	(0.663)
Midterm	-9.187***	1.308***	5.975***	0.952
	(1.985)	(0.483)	(1.606)	(0.707)
Primary	-5.439***	0.909*	3.048*	0.691
	(1.965)	(0.470)	(1.622)	(0.676)
Logged Population	-3.169	1.202	1.842	0.685
	(2.449)	(1.323)	(1.285)	(0.685)
Over 65	1.020	-4.535	1.142	0.132
	(11.74)	(5.299)	(8.203)	(5.258)
College Degree	12.89*	0.515	-15.51**	5.396
	(7.468)	(3.320)	(6.212)	(3.921)
Black CVAP	-36.22***	30.36***	13.38	-4.425*
	(10.58)	(11.08)	(13.08)	(2.677)
API CVAP	-70.46***	0.958	21.62***	31.57***
	(8.510)	(4.950)	(8.209)	(6.199)
Hispanic CVAP	-40.17***	4.240**	30.30***	2.674
	(5.692)	(2.014)	(4.987)	(1.785)
Median Income	0.0000	0.0000	-0.0001**	0.0000
	(0.0000)	(20.0000)	(0.0000)	(0.0000)
Off-cycle DV Mean	67.49	17.80	7.70	4.62
Observations	5,669	5,669	5,669	5,669
R-squared	0.438	0.035	0.303	0.080
Number of Cities	480	480	480	480
Sample	All Election Dates	All Election Dates	All Election Dates	All Election Dates
City and Year FE	Yes	Yes	Yes	Yes

Robust standard errors clustered by city in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A5. Election Timing and Voters SES

	Under $40K Income Share	Over $100K Income Share	Under $30K Wealth Share	Over $100K Wealth Share	Home-owner Share
Presidential	-1.362	5.458**	-2.415	-0.417	3.366
	(1.930)	(2.540)	(2.892)	(1.729)	(2.932)
Midterm	-1.606	5.664**	-3.711	-0.534	4.819
	(1.968)	(2.560)	(2.959)	(1.768)	(2.990)
Primary	-1.000	5.255**	-5.344*	0.179	6.668**
	(1.944)	(2.556)	(2.912)	(1.746)	(2.953)
Logged	-0.331	6.352***	-3.270	4.000**	-1.685
Population	(1.948)	(1.711)	(3.090)	(1.984)	(1.333)
Over 65	-1.255	18.30*	2.218	29.00*	9.770
	(11.06)	(10.60)	(12.36)	(16.66)	(9.319)
College Degree	-0.944	19.37***	0.440	-21.40**	-15.18**
	(6.494)	(6.368)	(12.31)	(8.650)	(7.006)
Black CVAP	18.36*	-22.16**	10.87	-5.552	0.526
	(9.514)	(11.18)	(16.78)	(8.370)	(7.531)
API CVAP	-4.520	2.866	-1.399	13.31	12.93*
	(7.066)	(8.466)	(8.527)	(10.64)	(7.644)
Hispanic CVAP	1.518	3.324	1.370	1.592	-1.149
	(4.173)	(2.812)	(8.376)	(2.941)	(4.553)
Median	-0.0001**	0.0000	-0.0001*	-0.0002***	0.0001*
Income	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.0000)
Off-cycle DV Mean	26.07	37.72	18.39	14.23	73.65
Observations	5,664	5,664	5,664	5,664	5,664
R-squared	0.016	0.041	0.120	0.077	0.154
Number of Cities	480	480	480	480	480
Sample	All Election Dates	All Election Dates	All Election Dates	All Election Dates	All Election Dates
City and Year FE	Yes	Yes	Yes	Yes	Yes

Robust standard errors clustered by city in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A6. Election Timing and the Age Composition of Voters

	Share of Voters over Age 55	Share of Voters Under Age 40
Presidential	-15.58***	5.029*
	(2.048)	(2.604)
Midterm	-12.79***	1.358
	(2.065)	(2.637)
Primary	-0.986	-3.860
	(2.058)	(2.617)
Logged Population	1.314	-0.299
	(2.389)	(3.483)
Over 65	27.85**	-31.73**
	(11.33)	(15.24)
College Degree	9.317	-14.79
	(8.823)	(10.26)
Black CVAP	-12.67	-9.312
	(9.848)	(17.47)
API CVAP	-17.98**	19.32**
	(7.268)	(8.328)
Hispanic CVAP	-10.23*	7.619
	(5.272)	(5.373)
Median Income	0.0000	0.0001
	(0.0001)	(0.0001)
Off-cycle DV Mean	49.74	13.23
Observations	5,669	5,664
R-squared	0.687	0.619
Number of Cities	480	481
Sample	All Election Dates	All Election Dates
City and Year FE	Yes	Yes

Robust standard errors clustered by city in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A7. Election Timing and the Political Composition of Voters

	Share of Democratic Voters	Share of Liberal Voters
Presidential	1.303	2.230
	(1.930)	(1.436)
Midterm	2.058	2.940**
	(1.946)	(1.463)
Primary	0.0172	1.204
	(1.942)	(1.449)
Logged Population	-0.362	-0.531
	(1.375)	(0.838)
Over 65	17.78**	10.81**
	(7.683)	(5.347)
College Degree	8.173	9.714**
	(6.023)	(4.352)
Black CVAP	34.90***	22.93***
	(11.75)	(7.499)
API CVAP	25.64***	15.25***
	(6.157)	(4.487)
Hispanic CVAP	9.200***	6.849***
	(3.508)	(2.222)
Median Income	-0.0000	-0.0000
	(0.0000)	(0.0000)
Off-cycle DV Mean	61.74	60.08
Observations	5,669	5,667
R-squared	0.243	0.243
Number of FIPS	480	480
Sample	All Election Dates	All Election Dates
City and Year FE	Yes	Yes

Robust standard errors clustered by city in parentheses
*** p<0.01, ** p<0.05, * p<0.1

F. Adding City-Specific Time Trends

Since the decision to hold off-cycle or on-cycle elections is largely locally determined in California and could be related to the composition of the electorate, one might worry that election timing is potentially endogenous. We address this concern in several ways. First, we emphasize that our fixed-effects approach leverages variation in voter composition *within* cities. Thus, if more diverse cities are the ones choosing to use on-cycle elections, these differences in baseline diversity are absorbed by and differenced out through the city fixed effects.

Second, a related concern might be that cities switch timing in response to *changes* in voter composition. For example, cities might switch their election timing in response to growth in the size of the non-white population. To ensure that these types of dynamics are not driving our results, we rerun all of our analyses with the inclusion of city-specific linear time trends, which should account for secular change in voter composition over time that may be correlated with election timing changes. These results, which are presented below, are quite similar to our primary specification.

Table A8. The Effects of Election Timing on Voter Composition: Adding City-Specific Time Trends

	White Share of Voters	Wealth Under $30k Share of Voters	Under Over 65 Share of Voters	Democrats Share of Voters
Presidential	-12.25***	3.286	-22.38***	5.527***
	(3.624)	(2.230)	(2.916)	(1.810)
Midterm	-8.572**	0.624	-13.59***	3.078*
	(3.529)	(2.179)	(2.905)	(1.795)
Primary	-5.388	-1.504	-3.179	2.000
	(3.378)	(2.048)	(3.113)	(1.749)
Logged Population	67.61	25.21	25.98	-20.42
	(56.70)	(24.85)	(37.47)	(20.90)
Over 65	-199.6	-93.13	17.86	416.7*
	(371.9)	(240.4)	(334.7)	(231.2)
College Degree	415.4	-109.2	235.6	687.6
	(939.5)	(519.4)	(844.1)	(538.4)
Black CVAP	47.54	-133.2	-10.63	-19.85
	(249.7)	(143.4)	(240.1)	(144.1)
API CVAP	89.67	-91.72	30.74	-171.4*
	(179.3)	(92.72)	(170.2)	(103.5)
Hispanic CVAP	170.9**	-182.9***	164.0*	-36.38
	(72.50)	(59.83)	(90.36)	(41.34)
Median Income	-0.00665	0.00328	-0.00378	-0.00394
	(0.00718)	(0.00401)	(0.00710)	(0.00399)
Total Races	0.110	-0.216	-0.129	-0.0932
	(0.284)	(0.243)	(0.349)	(0.253)
Mayor	-1.641**	-0.567	-0.429	-0.0400
	(0.800)	(0.628)	(0.629)	(0.403)
Candidates in Race	0.0454	-0.140	-0.0145	-0.0153
	(0.103)	(0.133)	(0.188)	(0.101)
Margin of Victory	-0.520	-1.690	-3.467	-1.159
	(3.096)	(3.282)	(3.075)	(1.684)
Off-cycle DV Mean	67.49	17.80	7.70	4.62
Observations	1,864	1,860	1,864	1,864
R-squared	0.566	0.467	0.683	0.617

Number of Cities	460	459	460	460
Sample	Local Election Dates	Local Election Dates	Local Election Dates	Local Election Dates
City Specific Time Trends	Yes	Yes	Yes	Yes

Robust standard errors clustered by city in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Finally, one of other alternative modeling strategies — which compares voter composition during off-cycle local elections to statewide elections when no local candidates are running — is particularly helpful. This strategy allows us to examine cities that use *only* off-cycle elections, and to estimate the *counterfactual* composition if these cities moved their elections to be held concurrently with state and federal contests. (Since the cities in the sample have not made such a change, there are no endogeneity concerns.) To be sure, these counterfactuals are not perfect, since they do not capture additional changes in composition from adding local elections to these statewide, even-year election ballots. Nevertheless, the results from this other analysis, which is reported above in Section E of the appendix, are quite similar to our main estimation sample, making us confident that endogeneity of election timing is not significantly biasing our estimates.

G. Interactions Between Election Timing and Racial Composition

In the table below, we present additional analyses that allows for the effect of timing to depend on the underlying demographic composition of the city. These results show that the impact of timing on voter racial composition increases as the share of the racial and ethnic minority voting-age population grows. These estimates suggest that the increase in the Hispanic share of the electorate during on-cycle elections is more than twice as large in cities where Hispanics make up at least half of the population compared to the average effects we document in the main text. The impact of timing on voter racial composition matters even more in places where minorities actually live. A figure illustrating these interaction effects is included in the main text.

Table A10. Election Timing and the Racial Composition of Voters

	Hispanic Share of Voters	Asian Share of Voters	White Share of Voters
Presidential	-5.08	-0.50	-24.14**
	(4.45)	(0.79)	(8.74)
Midterm	-6.37	-0.42	-15.40
	(4.45)	(0.80)	(8.57)
Primary	-6.53	-2.79	-15.97
	(4.69)	(2.30)	(8.54)
Percent Racial	54.33*	18.04*	26.63*
Group*Presidential	(26.96)	(7.65)	(12.78)
Percent Racial	43.52	6.84	18.94
Group*Midterm	(26.92)	(7.79)	(12.57)
Percent Racial	41.00	36.99	21.72
Group*Primary	(27.58)	(24.33)	(12.90)
Logged	2.30	-1.23	-5.57
Population	(2.52)	(1.28)	(2.96)
Over 65	-14.31	11.69	-12.48
	(19.05)	(15.07)	(21.98)
College Degree	-7.64	3.73	-1.29
	(11.27)	(9.34)	(15.29)
Black CVAP	21.57	-11.96	
	(29.46)	(9.43)	
API CVAP	31.75*	25.55	-64.54*
	(15.30)	(21.12)	(28.09)
Hispanic CVAP	-19.85	-0.53	-35.25*
	(26.57)	(2.70)	(17.14)
White CVAP			-16.43
			(19.61)
Median Income	0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)
Total Races	0.04	-0.18	0.01
	(0.20)	(0.14)	(0.23)
Mayor	0.65	0.13	-1.25
	(0.56)	(0.20)	(0.65)
Candidates in	-0.10	0.00	0.06
Race	(0.10)	(0.08)	(0.09)
Margin of Victory	-0.19	0.51	-0.34
	(2.27)	(1.33)	(2.31)

Off-cycle DV Mean	17.80	7.70	67.49
Observations	1,856	1,856	1,856
Cities	460	460	460
R-squared	0.96	0.89	0.97
City FE	Yes	Yes	Yes

Robust standard errors clustered by city in parentheses
*** p<0.01, ** p<0.05, * p<0.1

H. Assessing the Implications of Voter Roll Off

One limitation of our data is that the Catalist records indicate only whether a voter cast a ballot in each election but do not reveal whether the individual cast a vote in any given race. Voters could, for example, choose to vote in a presidential contest but then fail to mark the ballot for the contest for mayor held at the same time — a phenomenon often referred to as ballot roll-off. Our analysis (available from the authors by request) indicates that roughly 15-20 percent of voters skip the local contests that appear on the ballot during midterm and presidential elections. If the voters who turn out on these dates but roll off are disproportionately Democratic, liberal, poor and young, this could offset much of the demographic shift we documented in the main text.

To address this concern, we begin by examining precinct level returns in California's second largest city[1] — San Diego — to see if ballot roll-off there is, in fact, related to race, class, age, and partisanship. Specifically, we acquired precinct level election returns for all of San Diego's roughly 640 precincts from the November 2012 election, when ballots were cast both for president and mayor. We calculated roll off within each precinct as the difference in number of ballots cast in the presidential race and the mayoral race (converted to a percent of total ballots in the presidential race). Roll off averaged about 9% citywide, with considerable variation across precincts.[2] In addition, we merged information on voters who were recorded as having cast ballot in each precinct from UC Berkeley's Statewide Database, which is the repository for official redistricting data for the state. These counts are also reported the precinct level and disaggregated by party, age, and some racial and ethnic groups. The racial and ethnic demographics of voters were estimated by Statewide Database staff using a surname-based algorithm. Because that algorithm does not work well for distinguishing African-American and white

[1] Los Angeles, the largest city in the state, did not hold on-cycle elections during our period of study.
[2] In the analysis below, we exclude 14 precincts with roll off exceeding 20 percent, as these appear to be extreme outliers.

names, the available dataset does not break out African-Americans separately. So, our racial analysis focuses on the relationship between Latino population share and voter roll off.

The cross-sectional relationships, which are displayed in a series of figures below, suggest that roll off is not substantially higher in precincts with more minorities or more Democrats. Figure A2 shows the relationship between roll-off and Latino voter share. Across San Diego's 640 precincts, there is no indication that roll off was higher in heavily Latino precincts compared to overwhelmingly white precincts.

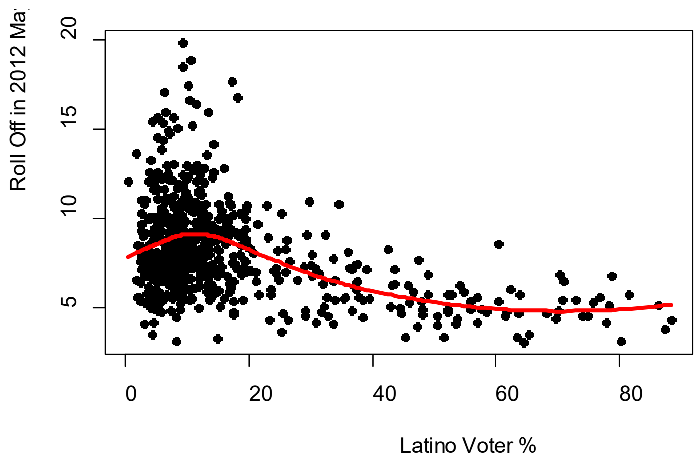

Figure A2. Precinct-Level Roll Off in 2012 San Diego Mayoral Election by Latino Voter Share

Likewise, as Figures A3 and A4 show, there is no evidence that roll off is substantially higher among Democrats than Republicans — measured either by Obama support at the precinct level, or official partisan registration.

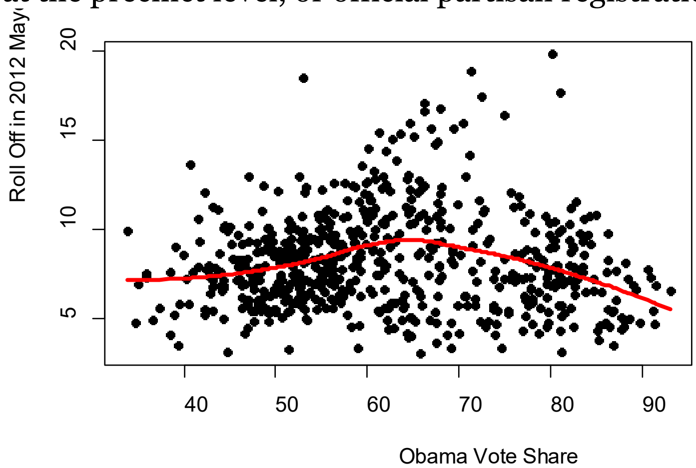

Figure A3. Precinct-Level Roll Off in 2012 San Diego Mayoral Election

by Obama Vote Share

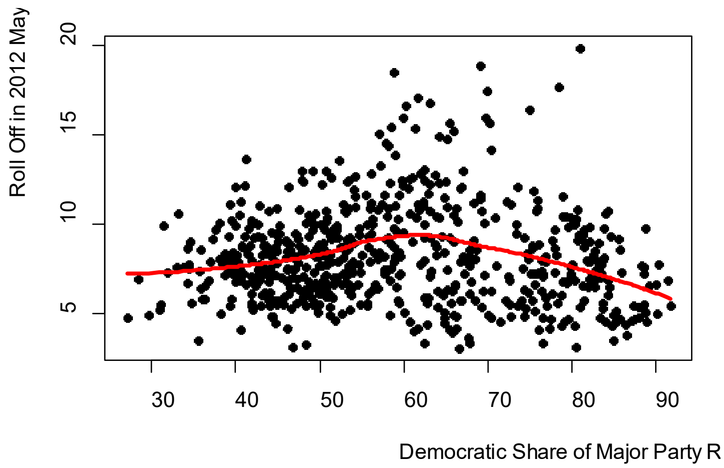

Figure A4. Precinct-Level Roll Off in 2012 San Diego Mayoral Election by Democratic Share of Voter Registration

There is, however, some evidence that older Americans are less likely to roll off. As Figure A5 shows, roll-off appears to be somewhat higher in precincts with fewer older resident.

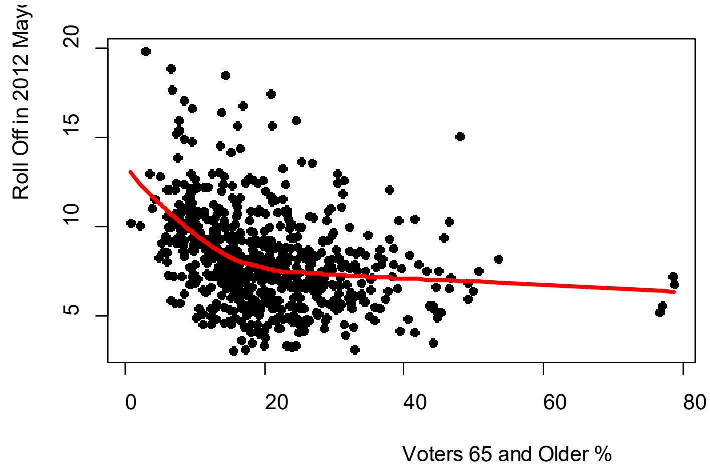

Figure A5. Precinct-Level Roll Off in 2012 San Diego Mayoral Election by Share of Voters 65 and Older

To examine these relationships more systematically, we estimated ecological inference models using the ei.MD.bayes function, based on the hierarchical Multinomial Dirichlet model for RxC tables proposed in King, Rosen and Tanner (1999), from the eiPack R library. The ecological inference estimates, based on the posterior draws for cell counts that are summed across precincts, are reported in the Tables A11 through A15. These results are similar to the patterns presented in the figures above. We do, however, note several interesting findings. Roll off rates appear to be particularly large among third-party voters and those who do not register with a major political party. Although Latino voters do not appear to roll off at higher rates than Whites, we do see significantly higher roll off among Asian voters. Finally, there is a clear age gradient: Fifteen percent of voters under the age 34 voted for president but left the mayoral race blank. This fell to about 7 percent among voters between the age of 35 and 44 and then leveled off at about 5 percent for voters 45 and older. Note that this latter effect, while large, is considerably smaller than the aggregate changes in voter age composition we find between off-cycle and presidential elections, suggesting that roll off may attenuate but is unlikely to fully offset the gains in participation of young voters produced by concurrent elections.

Table A11. Ecological Inference Estimates: Roll Off Rates by Party

Partisan Subgroup	Roll Off Rate
Obama Voter	5.8%
Romney Voter	9.9%
Third Party Voter	46.6%
Registered Democrat	2.6%
Registered Republican	3.0%
Undeclared/Third Party Registrant	21.8%

Table A12. Ecological Inference Estimates: Roll Off Rates by Selected Race and Ethnicity

Race/Ethnicity	Roll Off Rate
Latino	4.3%
Asian	11.0%
White/Black/Other	8.8%

Table A13. Ecological Inference Estimates: Roll Off Rates by Voter Age

Age	Roll Off Rate
18-24	12.2%
25-34	17.6%
35-44	6.9%
45-54	5.5%
55-64	6.0%
65 and older	4.8%

Of course, patterns in San Diego might be unique and the 2012 election might differ from other contests. In addition to the analysis above, we examine cross-sectional variation in the level of observed roll off across all cities in the state to see if roll off is correlated with *aggregate* voter demographics. Specifically, for both presidential and midterm contests, we looked to see if cities with a higher share of white voters, more Democrats, and more older voters (over age 55) experienced differential rates of roll off.

The figure below examines this cross-sectional variation, plotting the level of roll off observed in each election against our Catalist compositional measures. We use a loess smoother to flexibly trace the average relationship between the amount of roll off and each compositional measure.

We find no evidence that roll off is greater in more racially diverse or more Democratic cities or in jurisdictions with a younger electorate. None of these relationships is particularly strong or linear but they do appear to be in the *opposite direction* of the compositional effects of timing we report in the main text.

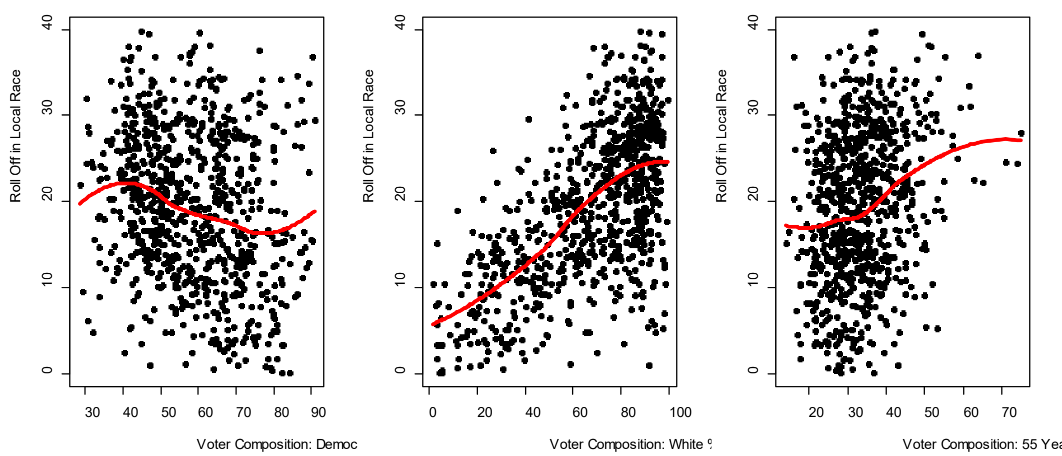

Figure A6. Ballot Roll Off in Local Races Held Concurrently with Presidential Election, by City Demographics

While the results suggest that roll off is unlikely to substantially reduce the representational gains produced by on-cycle elections, it is worth noting two limitations in our analysis. First, the relationships are subject to the usual concerns about bias in ecological inference. Second, the *average* roll off rates we report above may not be the same as the roll off rates among the *marginal voters* in these subgroups — the subset whose participation is directly impact by election timing. We encourage additional future studies with access to individual-level data (perhaps using actual ballot images) to specifically examine roll off in local elections.

References

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King, Gary, Ori Rosen, and Martin A. Tanner. 1999. "Binomial-Beta Hierarchical Models for Ecological Inference." *Sociological Methods and Research* 28(1): pp. 61-90.