PARTISAN LEAN OF STATES: ELECTORAL COLLEGE AND POPULAR VOTE

Benjamin Osafo Agyare
Connor Dayton
Jaucelyn Canfield

March 2, 2020

University of Nevada, Reno

Table of Content

University of Nevada, Reno

Introduction

We compare federal election results for each state versus the USA in every second year from 1992 to 2018, to model partisan lean of each state and its dependence on the nationwide popular vote. For each state, we model both its current partisan lean and its rate of change, as well as sensitivity of state results with respect to the nationwide popular vote, using Bayesian linear regression. We apply this to simulate the Electoral College outcome in 2020, given even (equal) nationwide popular vote, as well as 2016, 2008, and 2004 nationwide popular vote. We backtest 2012 and 2016 elections given actual popular vote. Taking equal popular vote for two major parties, we investigate whether the Electoral College is biased towards Republicans.

University of Nevada, Reno

Research Question

- Investigate whether the Electoral College is biased towards Republicans.

University of Nevada, Reno

Data Collection

Our data is taken from the Federal Election Commission and the House Clerk web page for the year intervals 2000 - 2016 and 1992 - 1998 respectively.

Structure of our model:

$$y_{st} = \alpha_s + \beta_s x_t + \gamma_s t + \sigma_s \epsilon_{st}; \quad \epsilon_{st} \sim \mathcal{N}(0,1) \quad i.i.d$$

$$\text{and we compute } x_t = ln\frac{d(e)}{r(e)} \text{ and } y_{st} = average(ln\frac{d_s(e)}{r_s(e)})$$

for election events, e, and election year, $t \in \{1, 2, 3, ..., 14\}$

University of Nevada, Reno

Data Collection

	1992 t = 0						1996 t = 2											
	Presidential 1992		Senate 1992		HOR 1992		Senate Election		HOR Election		Presidential Election		Senate Election		HOR Election		Presidential Election	
	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R
Alabama	690080	804283	1022698	522015	895601	643150			554154	558437	662165	769044	681651	786436	656047	785513		
Alaska	78294	102000	92065	127163	102378	111849			68172	118537	80380	122746	23977	177893	85114	138834		
Arizona	543050	572086	436321	771395	582317	740047	442510	600999	409672	652831	653288	622073			521345	800917		
Arkansas	505823	337324	553635	366373	525197	356900			336123	372889	475171	325416	400241	445942	395506	456033		
California	5121325	3630574	5173467	4644182	5446965	4365155	3979152	3817025	3959954	4070290	5119835	3828381			4706276	4291644		
Colorado	629681	562850	803725	662893	691479	757666			364391	687070	671152	691848	667600	750315	596575	832763		
Connecticut	682318	578313	577662	572036	501887	699155	443793	334833	416095	505150	735740	483109			674307	547084		
Delaware	126054	102313			117426	153037	84540	111074	51793	137945	140355	99062	165465	105088	73258	185577		
Florida	2072698	2173310	3245565	1716505	2256681	2510725	1210577	2895200	1155646	1694181	2546870	2244536			2036620	2639567		
Georgia	1008966	995252	618877	635114	1214792	999182			681051	816484	1053849	1080843	1103993	1073969	1011190	1151993		
Hawaii	179310	136822	208266	97928	260786	81645	256189	86320	219185	119514	205012	113943			195910	135782		
Idaho	137013	202645	208036	270468	222435	230766			137762	255321	165443	256595	198422	283532	193524	289990		
Illinois	2453350	1734096	2631229	2126833	2677685	2096717			1459928	1576655	2341744	1587021	2384028	1728824	2267369	1812673		
Indiana	848420	989375	900148	1267972	1205869	998334	470799	1039625	667454	875082	887424	1006693			930919	1109066		
Iowa	586353	504891	351561	899761	492843	729496			407309	560117	620258	492644	634166	571807	532815	649959		
Kansas	390434	449951	349525	706246	488381	591712			298269	519127	387659	583245	362380	652677	424984	591146		
Kentucky	665104	617178	836888	476604	721747	638166			316037	450640	636614	623283	560012	724794	507431	730739		
Louisiana	815971	733386			284910	398679					927837	712586	852945	847157	339163	135990		
Maine	263420	206504			363520	278258	186042	308244	235988	234070	312788	186378	266226	298422	379184	211210		
Maryland	988571	707094	1307610	533688	955952	842789	809125	559908	662312	682578	966207	681530			876658	762163		
Massachusetts	1318639	805039			1518208	856572	1265997	894000	1362572	592758	1571509	718058	1334135	1143120	1584479	780032		
Michigan	1871182	1554940			1913175	1855241	1300960	1578770	1418142	1532084	1989653	1481212	2195738	1500106	1945116	1678735		
Minnesota	1020997	747841			1178072	930814	781860	869653	883905	846950	1120380	766395	1098430	901194	1179862	894908		
Mississippi	400258	487793			669582	273234	189752	418333	354487	256424	394022	439838	240647	624154	397410	487988		
Missouri	1053873	811159	1057967	1221901	1269486	1036268	633697	1060149	893783	834456	1025935	890016			1116201	833190		
Montana	154507	144207			203711	189570	131845	218542	171372	148715	167922	179652	201935	182111	174516	211975		
Nebraska	216864	343678			283278	427398	317297	260668	203062	365402	236761	363467	281904	379933	204432	450067		
Nevada	189148	175828	253150	199413	245477	213792	193804	156020	137723	215971	203974	199244			172823	248782		
New Hampshire	209040	202484	234982	249591	265906	227062			116724	180138	246166	196486	227355	242257	221286	246896		
New Jersey	1436206	1356865			1354915	1503145	1033487	966244	879855	1091251	1652361	1103099	1519154	1227351	1351762	1398900		
New Mexico	261617	212824			272607	277833	249989	213025	187532	263477	273495	232751	164356	357171	271144	260961		
New York	3346894	2041690	2943001	2652822	2946645	2371652	2528387	1711760	2146180	1992633	3756177	1933492			2918770	2038923		
North Carolina	1114042	1134661	1194015	1297892	1282474	1203983			681064	907093	1107849	1225938	1173875	1345833	1135731	1339515		
North Dakota	99168	136244	179347	118162	169273	117442	137157	99390	123134	105988	106905	125050			144833	113684		
Ohio	1984942	1894310	2444419	2028300	2198039	2154080	1348213	1836556	1327955	1925452	2148222	1859883			2033028	2192174		
Oklahoma	473066	592929	494350	757876	764249	504133			368063	554800	488105	582315	474162	670610	430480	722998		
Oregon	621314	475757	639851	717455	824796	553101			646589	498628	649641	538152	624370	677336	724496	557525		
Pennsylvania	2239164	1791841	2224966	2358125	2154372	2347441	1648481	1735691	1491859	1830779	2215819	1801169			2222863	2037508		
Rhode Island	213299	131601			192542	185980	122532	222856	209491	132417	233050	104683	230676	127368	240608	107657		
South Carolina	525514	577507	591030	554175	505887	581159			313043	552085	506152	573339	510951	619859	345010	682563		

Raw | Logs | Average of Logs | EC

Figure 1:

University of Nevada, Reno