The Economy and Voting Behavior

Ray C. Fair

February 22, 2017

How sophisticated are voters?

- Downs (1957)
- Kramer (1971)
- Stigler (1973)

In June 1971 Orley Ashenfelter used a Kramer-type equation and my economic growth forecasts to predict that Nixon would get a little over 60 percent of the two-party vote in 1972. Nixon actually received 61.8 percent.

Bill Branson?

Testing alternative theories

- Fair (1978)

$$V_{it} = \begin{cases} 1 & \text{if } U_{it}^D > U_{it}^R \\ 0 & \text{otherwise} \end{cases}$$

$$U_{it}^D = \xi_{it}^D + \beta_1 \frac{M_{td1} - M^*}{(1+\rho)^{t-td1}} + \beta_2 \frac{M_{td2} - M^*}{(1+\rho)^{t-td2}} + \gamma_1 DPER_t^D + \gamma_2 DUR_t^D$$

$$U_{it}^R = \xi_{it}^R + \beta_3 \frac{M_{tr1} - M^*}{(1+\rho)^{t-tr1}} + \beta_4 \frac{M_{tr2} - M^*}{(1+\rho)^{t-tr2}} + \gamma_1 DPER_t^R + \gamma_2 DUR_t^R$$

$$\psi_{it} = \xi_{it}^R - \xi_{it}^D$$

$$\begin{aligned} q_t = \beta_1 \frac{M_{td1} - M^*}{(1+\rho)^{t-td1}} + \beta_2 \frac{M_{td2} - M^*}{(1+\rho)^{t-td2}} \\ -\beta_3 \frac{M_{tr1} - M^*}{(1+\rho)^{t-tr1}} - \beta_4 \frac{M_{tr2} - M^*}{(1+\rho)^{t-tr2}} \\ +\gamma_1 DPER_t + \gamma_2 DUR_t \end{aligned}$$

where $DPER_t = DPER_t^D - DPER_t^R$
and $DUR_t = DUR_t^D - DUR_t^R$.

$$V_{it} = \begin{cases} 1 & \text{if } q_t > \psi_{it} \\ 0 & \text{otherwise} \end{cases}$$

$$f(\psi_t) = \begin{cases} \frac{1}{b-a} & \text{for } a+\delta_t < \psi_t < b+\delta_t \\ 0 & \text{otherwise} \end{cases}$$

$$F(\psi_t) = \begin{cases} 0 & \text{for } \psi_t \leq a+\delta_t \\ \frac{\psi_t - a - \delta_t}{b-a} & \text{for } a+\delta_t < \psi_t < b+\delta_t \\ 0 & \text{for } \psi_t \geq b+\delta_t \end{cases}$$

V_t is the Democratic share of the two-party vote. It is the probability that $\psi_t \leq q_t$, which is the CDF at q_t:

$$V_t = -\frac{a}{b-a} + \frac{q_t}{b-a} - \frac{\delta_t}{b-a}$$
$$V_t = \lambda_0 + \lambda_1 q_t + \epsilon_t$$

where $\lambda_0 = -a/(b-a)$, $\lambda_1 = 1/(b-a)$,
and $\epsilon_t = -\delta_t/(b-a)$.

$$V_t = \lambda_0 + \lambda_1 \beta_1 \frac{M_{td1} - M^*}{(1+\rho)^{t-td1}} + \lambda_1 \beta_2 \frac{M_{td2} - M^*}{(1+\rho)^{t-td2}} - \lambda_1 \beta_3 \frac{M_{tr1} - M^*}{(1+\rho)^{t-tr1}}$$
$$-\lambda_1 \beta_4 \frac{M_{tr2} - M^*}{(1+\rho)^{t-tr2}} + \lambda_1 \gamma_1 DPER_t + \lambda_1 \gamma_2 DUR_t + \epsilon_t$$

If $\rho = \infty$ and $\beta_1 = \beta_3$

$$V_t = \lambda_0 + \lambda_1\beta_1(M_t - M^*)I_t + \lambda_1\gamma_1 DPER_t + \lambda_1\gamma_2 DUR_t + \epsilon_t$$

where I_t equals 1 if there is a Democratic incumbent and -1 if there is a Republican incumbent.

If there is more than one measure of performance

$$M_t - M^* : \omega_1(M_{1t} - M_1^*) + \omega_2(M_{2t} - M_2^*) + \omega_3(M_{3t} - M_3^*)$$

$$V_t = \alpha_0 + \alpha_1 M_{1t}I_t + \alpha_2 M_{2t}I_t + \alpha_3 M_{3t}I_t + \alpha_4 DPER_t + \alpha_5 DUR_t + \alpha_6 I_t + \epsilon_t$$

where $\alpha_0 = \lambda_0$, $\alpha_1 = \lambda_1\beta_1\omega_1$,
$\alpha_2 = \lambda_1\beta_1\omega_2$, $\alpha_3 = \lambda_1\beta_1\omega_3$, $\alpha_4 = \lambda_1\gamma_1$, $\alpha_5 = \lambda_1\gamma_2$,
$\alpha_6 = -(\lambda_1\beta_1\omega_1 M_1^* + \lambda_1\beta_1\omega_2 M_2^* + \lambda_1\beta_1\omega_3 M_3^*)$.

Treatment of the war dummy

$$M_t - M^* : \omega_1(M_{1t} - M_1^*) + \omega_2(M_{2t} - M_2^*)(1 - WAR_t)$$
$$+\omega_3(M_{3t} - M_3^*)(1 - WAR_t)$$

$$V_t = \alpha_0 + \alpha_1 M_{1t}I_t + \alpha_2 M_{2t}I_t + \alpha_3 M_{3t}I_t + \alpha_4 DPER_t + \alpha_5 DUR_t + \alpha_6 I_t$$
$$+(\lambda_1\beta_1\omega_2 M_2^* + \lambda_1\beta_1\omega_3 M_3^*)WAR_t + \epsilon_t$$

On-term House Election

$$\delta_t = \theta_0 + \theta_1(V^{cc}_{t-2} - 50) + \eta_t \quad , \qquad \theta_1 < 0$$

where V^{cc}_{t-2} is the Democratic share of the two-party vote in the previous mid-term House election.

Mid-term House Election

$$\delta_t = \phi_0 + \phi_1(V^{c}_{t-2} - 50) + \phi_2(V^{p}_{t-2} - 50) + \mu_t \quad , \quad \phi_1 < 0, \quad \phi_2 > 0,$$

where V^{c}_{t-2} is the Democratic share of the two-party vote in the previous on-term House election and V^{p}_{t-2} is the Democratic share of the two-party vote in the previous presidential election.

Political Science Results

1. No coattails effect for on-term House election
2. Serial correlation for both on-term and mid-term House elections
3. Balance effect for mid-term House election

Table 1
Variables

Variable	Definition
V^p	Democratic share of the two-party presidential vote.
V^c	Democratic share of the two-party on-term House vote.
V^{cc}	Democratic share of the two-party mid-term House vote.
I	1 if there is a Democratic presidential incumbent at the time of the election and -1 if there is a Republican presidential incumbent.
$DPER$	1 if a Democratic presidential incumbent is running again, -1 if a Republican presidential incumbent is running again, and 0 otherwise.
DUR	0 if either party has been in the White House for one term, 1 [-1] if the Democratic [Republican] party has been in the White House for two consecutive terms, 1.25 [-1.25] if the Democratic [Republican] party has been in the White House for three consecutive terms, 1.50 [-1.50] if the Democratic [Republican] party has been in the White House for four consecutive terms, and so on.
WAR	1 for the elections of 1918, 1920, 1942, 1944, 1946, and 1948, and 0 otherwise.
G	growth rate of real per capita GDP in the first three quarters of the on-term election year (annual rate).
G^{cc}	growth rate of real per capita GDP in the first three quarters of the mid-term election year (annual rate).
P	absolute value of the growth rate of the GDP deflator in the first 15 quarters of the administration (annual rate) except for 1920, 1944, and 1948, where the values are zero.
P^{cc}	absolute value of the growth rate of the GDP deflator in the first 7 quarters of the administration (annual rate) except for 1918, 1942, and 1946, where the values are zero.
Z	number of quarters in the first 15 quarters of the administration in which the growth rate of real per capita GDP is greater than 3.2 percent at an annual rate except for 1920, 1944, and 1948, where the values are zero.
Z^{cc}	$\frac{15}{7}$ times number of quarters in the first 7 quarters of the administration in which the growth rate of real per capita GDP is greater than 3.2 percent at an annual rate except for 1918, 1942, and 1946, where the values are zero.7

• Sample period: 1916, 1920, . . . , 2012 for the V^p and V^c equations and 1918, 1922, . . . , 2014 for the V^{cc} equation.

Table 2
Estimated Equations

	Eq. 1 V^p	Eq. 2 V^c	Eq. 2a V^c	Eq. 3 V^{cc}	Eq. 3a V^{cc}
$Index$	–	–	0.558	–	0.622
			(6.16)		(3.03)
$G \cdot I$	0.667	0.393	0.372	–	–
	(5.79)	(3.65)			
$P \cdot I$ or $P^{cc} \cdot I$	−0.690	−0.383	*−0.385*	−0.469	*−0.429*
	(−2.34)	(−1.43)		(−2.26)	
$Z \cdot I$ or $Z^{cc} \cdot I$	0.968	0.470	*0.540*	0.577	*0.602*
	(4.03)	(1.98)		(2.57)	
$DPER$	3.01	2.80	2.88	–	–
	(2.14)	(2.65)	(3.05)		
DUR	−3.80	–	–	–	–
	(−3.10)				
I	−1.56	−3.45	−3.84	−2.94	−3.10
	(−0.71)	(−2.01)	(−4.33)	(−2.69)	(−3.49)
WAR	4.89	2.18	2.41	0.42	0.60
	(1.92)	(1.01)	(1.45)	(0.22)	(0.35)
$CNST$	47.75	49.96	49.97	48.73	48.76
	(79.15)	(90.92)	(96.45)	(76.85)	(80.28)
$V^{cc}_{-2} - 50$	–	0.603	0.583	–	–
		(4.38)	(5.11)		
$V^{c}_{-2} - 50$	–	–	–	0.748	0.735
				(4.49)	(4.72)
$V^{p}_{-2} - 50$	–	–	–	−0.312	−0.323
				(−2.16)	(−2.38)
SE	2.62	2.33	2.21	2.36	2.30
R^2	0.897	0.834	0.833	0.795	0.794
No. obs.	25	25	25	25	25

• Estimation method: OLS; t-statistics are in parentheses.
• Estimation period: 1916–2012 for V^p and V^c, 1918–2014 for V^{cc}.
• $Index$ for V^c is $0.667 \cdot G \cdot I - 0.690 \cdot P \cdot I + 0.968 \cdot Z \cdot I$. The hypothesis that the weights in this index are correct is not rejected: F-value of 0.052, which with 2,17 degrees of freedom has a p-value of 0.949.
• $Index$ for V^{cc} is $-0.690 \cdot P^{cc} \cdot I + 0.968 \cdot Z^{cc} \cdot I$. The hypothesis that the weights in this index are correct is not rejected: F-value of 0.072, which with 1,18 degrees of freedom has a p-value of 0.788.
• Values in italics are implied values.

Table 3
Predicted Values and Estimated Residuals from Table 2

	Act.	Eq. 1		Act.	Eq. 2a		Act.	Eq. 3a		
t	V^p	$\hat{V}^p$	$\hat{u}^p$	V^c	$\hat{V}^c$	$\hat{u}^c$	V^{cc}	$\hat{V}^{cc}$	$\hat{u}^{cc}$	$t+2$
1916	51.7	50.7	-1.0	48.9	50.0	1.1	45.1	44.9	-0.2	1918
1920	36.1	39.6	3.5	38.0	41.4	3.5	46.4	44.7	-1.7	1922
1924	41.7	42.8	1.0	42.1	46.9	4.8	41.6	42.3	0.8	1926
1928	41.2	43.4	2.1	42.8	43.5	0.6	45.7	47.7	2.0	1930
1932	59.1	61.5	2.4	56.9	54.3	-2.6	56.5	51.2	-5.3	1934
1936	62.2	64.0	1.7	58.5	61.1	2.6	50.8	51.8	1.0	1938
1940	55.0	55.7	0.7	53.0	55.2	2.3	47.7	46.8	-0.8	1942
1944	53.8	52.1	-1.7	51.7	51.6	-0.1	45.3	46.3	1.0	1946
1948	52.3	50.5	-1.8	53.2	49.9	-3.3	50.0	51.1	1.0	1950
1952	44.7	45.3	0.6	49.9	49.4	-0.5	52.5	52.6	0.0	1954
1956	42.9	43.6	0.7	51.0	50.9	-0.1	56.0	54.7	-1.2	1958
1960	50.1	49.2	-0.9	54.8	55.1	0.3	52.5	53.8	1.3	1962
1964	61.2	60.4	-0.8	57.3	56.7	-0.6	51.2	52.8	1.5	1966
1968	49.4	50.4	1.0	50.9	51.3	0.4	54.4	53.6	-0.8	1970
1972	38.2	41.9	3.7	52.7	51.0	-1.6	58.5	58.5	0.0	1974
1976	51.0	50.9	-0.2	56.9	57.5	0.7	54.4	52.6	-1.8	1978
1980	44.8	46.3	1.4	51.4	49.9	-1.4	56.0	55.0	-1.0	1982
1984	40.9	38.5	-2.4	52.8	50.0	-2.7	55.1	55.3	0.2	1986
1988	46.2	48.7	2.5	54.0	54.3	0.3	54.2	55.1	0.9	1990
1992	53.6	48.3	-5.3	52.7	51.9	-0.9	46.5	48.1	1.7	1994
1996	54.7	53.9	-0.9	50.2	49.6	-0.6	49.5	47.5	-2.0	1998
2000	50.3	49.4	-0.9	49.8	49.7	-0.1	47.6	52.4	4.9	2002
2004	48.8	44.5	-4.3	48.6	48.5	-0.1	54.1	50.1	-4.0	2006
2008	53.7	54.3	0.6	55.5	56.9	1.3	46.6	48.1	1.6	2010
2012	52.0	50.1	-1.9	50.7	47.5	-3.2	46.5	47.5	1.0	2014
RMSE			2.16			1.92			2.01	

- $\hat{u}^p = \hat{V}^p - V^p$.
- $\hat{u}^c = \hat{V}^c - V^c$.
- $\hat{u}^{cc} = \hat{V}^{cc} - V^{cc}$.
- RMSE = root mean squared error.

Table 4
Full Information
Maximum Likelihood Estimates

	Eq. 1 V^p	Eq. 2a V^c	Eq. 3a V^{cc}
$G \cdot I$	0.676	0.365	–
	(7.37)	(5.50)	
$P \cdot I$ or $P^{cc} \cdot I$	−0.717	*−0.387*	−0.362
	(−3.56)		(−2.27)
$Z \cdot I$ or $Z^{cc} \cdot I$	0.958	*0.517*	*0.484*
	(5.03)		
$DPER$	2.80	3.06	–
	(2.41)	(3.64)	
DUR	−3.87	–	–
	(−4.16)		
I	−1.36	−3.73	−2.83
	(−0.85)	(−3.90)	(−3.46)
WAR	4.87	2.22	0.57
	(2.44)	(1.50)	(0.38)
$CNST$	47.74	49.98	48.99
	(96.35)	(111.05)	(85.65)
$V^{cc}_{-2} - 50$	–	0.582	–
		(6.24)	
$V^{c}_{-2} - 50$	–	–	0.678
			(4.51)
$V^{p}_{-2} - 50$	–	–	−0.251
			(−1.92)
SE	2.17	1.93	2.06
No. obs.	25	25	25

• Estimation method: FIML.
• Coefficient constraints on equations (2a) and (3a) imposed.
• Errors assumed to be correlated across equations.
• t-statistics are in parentheses, not adjusted for degrees of freedom.
• Values in italics are implied values.

Table 5
Ex Ante and Ex Post Forecasts
Democratic Share of the Two-Party Vote

		Ex Ante		Ex Post	
	Actual	**Forecast**	**Error**	**Forecast**	**Error**
Presidential Equation					
1980	44.8	46.4	1.6	46.3	1.4
1984	40.9	43.2	2.3	38.5	-2.4
1988	46.2	48.1	1.9	48.7	2.5
1992	53.6	43.1	-10.5	48.3	-5.3
1996	54.7	51.0	-3.7	53.9	-0.9
2000	50.3	50.8	0.5	49.4	-0.9
2004	48.8	42.3	-6.5	44.5	-4.3
2008	53.7	51.9	-1.8	54.3	0.6
2012	52.0	49.0	-3.0	50.1	-1.9
MAE			3.53		2.24
On-Term House Equation					
2008	55.5	55.8	0.3	56.9	1.3
2012	50.7	46.0	-4.7	47.5	-3.2
MAE			2.80		2.25
Mid-Term House Equation					
2010	46.6	49.2	2.6	48.1	1.6
2014	46.5	50.9	4.4	47.5	1.0
MAE			3.50		1.30

- Ex Post forecasts from Table 3.
- Ex Ante forecasts explained in the text.

Table A
Data for the V^p and V^c Equations

t	V^p	V^c	I	$DPER$	DUR	WAR	G	P	Z
1916	51.682	48.881	1	1	0.00	0	2.229	4.252	3
1920	36.148	37.957	1	0	1.00	1	-11.463	0.000	0
1924	41.737	42.093	-1	-1	0.00	0	-3.872	5.161	10
1928	41.244	42.838	-1	0	-1.00	0	4.623	0.183	7
1932	59.149	56.874	-1	-1	-1.25	0	-14.350	6.928	4
1936	62.226	58.476	1	1	0.00	0	11.682	2.498	9
1940	54.983	52.967	1	1	1.00	0	3.913	0.051	8
1944	53.778	51.718	1	1	1.25	1	4.122	0.000	0
1948	52.319	53.190	1	1	1.50	1	3.214	0.000	0
1952	44.710	49.944	1	0	1.75	0	0.997	2.353	7
1956	42.906	50.970	-1	-1	0.00	0	-1.252	1.907	5
1960	50.087	54.790	-1	0	-1.00	0	0.674	1.980	5
1964	61.203	57.324	1	1	0.00	0	5.030	1.241	9
1968	49.425	50.921	1	0	1.00	0	5.045	3.086	7
1972	38.209	52.660	-1	-1	0.00	0	5.834	4.813	4
1976	51.049	56.850	-1	0	-1.00	0	3.817	7.463	5
1980	44.842	51.383	1	1	0.00	0	-3.583	7.795	5
1984	40.877	52.778	-1	-1	0.00	0	5.550	5.210	8
1988	46.168	54.011	-1	0	-1.00	0	2.403	2.871	5
1992	53.621	52.744	-1	-1	-1.25	0	3.035	3.193	3
1996	54.737	50.158	1	1	0.00	0	3.315	2.031	4
2000	50.262	49.819	1	0	1.00	0	2.031	1.683	7
2004	48.767	48.632	-1	-1	0.00	0	2.086	2.141	2
2008	53.689	55.535	-1	0	-1.00	0	-1.787	2.745	2
2012	52.010	50.681	1	1	0.00	0	1.422	1.470	1

• The values of P for 1920, 1944, and 1948 before multiplication by zero are 16.535, 5.489, and 8.688, respectively, and the values of Z are 5, 14, and 5.

Table A (continued)
Data for the V^{cc} Equation

t	V^{cc}	I	WAR	G^{cc}	P^{cc}	Z^{cc}
1914	50.338					
1918	45.096	1	1	22.006	0.000	0.0000
1922	46.400	-1	0	14.368	11.480	12.8571
1926	41.572	-1	0	3.461	0.117	10.7143
1930	45.741	-1	0	-11.206	2.071	4.2857
1934	56.509	1	0	12.736	3.993	8.5714
1938	50.815	1	0	4.597	0.033	6.4286
1942	47.664	1	1	16.073	0.000	0.0000
1946	45.277	1	1	-4.401	0.000	0.0000
1950	50.044	1	0	13.442	0.166	6.4286
1954	52.537	-1	0	-0.686	0.800	2.1429
1958	55.983	-1	0	-1.160	2.713	2.1429
1962	52.492	1	0	3.681	1.113	8.5714
1966	51.250	1	0	3.724	2.577	10.7143
1970	54.403	-1	0	-0.023	5.028	2.1429
1974	58.530	-1	0	-2.917	8.093	4.2857
1978	54.416	1	0	5.978	6.679	8.5714
1982	55.994	-1	0	-2.883	7.086	4.2857
1986	55.085	-1	0	2.330	2.430	4.2857
1990	54.177	-1	0	0.816	3.814	4.2857
1994	46.476	1	0	2.754	2.203	4.2857
1998	49.533	1	0	3.262	1.336	6.4286
2002	47.562	-1	0	1.694	1.785	0.0000
2006	54.120	-1	0	1.179	3.259	4.2857
2010	46.561	1	0	2.005	0.922	0.0000
2014	46.500	1	0	1.273	1.477	4.2857

- Observation of V^{cc} for 1914 needed for the V^{c} equation.
- The values of P^{cc} for 1918, 1942, and 1946 before multiplication by zero are 15.735, 8.082, and 10.518, respectively, and the values of Z^{cc} are 10.7143, 15.0000, and 4.2857.

Table B
Predictions of 2016 Election

	G	P	Z	V^p	V^c
November 11, 2014	2.97	2.14	6	48.7	47.6
January 31, 2015	3.04	1.86	3	46.0	46.1
April 29, 2015	3.22	1.14	5	48.6	47.6
July 31, 2015	3.03	1.33	3	46.4	46.3
October 31, 2015	2.16	1.37	3	45.8	46.0
January 30, 2016	1.97	1.37	3	45.7	45.9
April 28, 2016	0.87	1.28	3	45.0	45.5
July 29, 2016	0.94	1.40	2	44.0	45.0
October 28, 2016	0.97	1.42	2	44.0	45.0
Actual				51.1	49.0
Error				-7.1	-4.0

Table C
Equation Estimated through 1960

	Eq. 1	Eq. 1
$G \cdot I$	0.667	0.814
	(5.79)	(7.73)
$P \cdot I$	−0.690	−0.412
	(−2.34)	(−1.10)
$Z \cdot I$	0.968	0.737
	(4.03)	(3.00)
$DPER$	3.01	5.05
	(2.14)	(4.01)
DUR	−3.80	−2.22
	(−3.10)	(−2.42)
I	−1.56	−3.13
	(−0.71)	(−1.40)
WAR	4.89	4.67
	(1.92)	(1.97)
$CNST$	47.75	46.41
	(79.15)	(77.95)
SE	2.62	1.53
R^2	0.897	0.986
No. obs.	25	12
RMSE(25)	2.16	2.87

References

[1] Downs, Anthony, 1957, *An Economic Theory of Democracy*, New York: Harper and Row.

[2] Fair, Ray C., 1978, ”The Effect of Economic Events on Votes for President,” *Review of Economics and Statistics*, May, 159–173.

[3] Fair, Ray C., 1996b, ”Econometrics and Presidential Elections,” *The Journal of Economic Perspectives*, Summer, 89–102.

[4] Fair, Ray C., 2009, ”Presidential and Congressional Vote-Share Equations,” *American Journal of Political Science*, January, 55–72.

[5] Fair, Ray C., 2010, ”Presidential and Congressional Vote-Share Equations: November 2014 Update,” November 11, unpublished.

[6] Kramer, Gerald H., 1971, “Short-Term Fluctuations in U.S. Voting Behavior, 1896–1964,” *The American Political Science Review*, 65, 131-143.

[7] Stigler, George J., 1973, “General Economic Conditions and National Elections,” *The American Economic Review*, 63, 160–167.