Presidential and Congressional Vote-Share Equations: November 2022 Update

Ray C. Fair*

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Abstract

The three vote-share equations in Fair (2009) are updated using data available as of November 21, 2022. The equations are reestimated incorporating the new data, and forecasts of the 2024 presidential and House elections are made.

1 Introduction

Three vote-share equations are estimated in Fair (2009)—presidential, on-term House, and mid-term House. These equations are updated in this paper using data available as of November 21, 2022. The sample period in Fair (2009) was 1916–2004 for the first two equations and 1918–2006 for the third. In this update four observations have been added. The sample period is 1916–2020 for the first two equations and 1918–2022 for the third. No specification changes have been made; the equations are simply reestimated using four more observations.

The history of the equations is briefly discussed in Section 2; the data are discussed in Section 3; the estimates are presented in Section 4; a comparison

*Cowles Foundation, Department of Economics, Yale University, New Haven, CT 06520-8281. email: ray.fair@yale.edu; website: *fairmodel.econ.yale.edu*.

of ex ante and ex post forecasts is made in Section 5; and forecasts for the 2024 presidential and on-term House elections are presented in Section 6. Appendix A contains a complete description of how the data were collected and a listing of all the data. The results in this paper can be duplicated using these data if desired.

2 History of the Equations

The presidential vote equation was first presented in Fair (1978). The previous updates of this equation are in Fair (1982, 1988, 1990, 1996a, 1998, 2002a, 2006, 2010, 2014, 2018). The specification of the equation has not been changed since changes following the 1992 election. The easiest paper to read regarding the changes that were made to the equation between the original specification and the specification after the 1992 election is Fair (1996b). A non technical discussion is in Fair (2002b). The on-term and mid-term House equations were first presented in Fair (2009). The specification of these two equations has also not been changed for this update.

Counting the original presidential vote paper and the 10 updates, there are 11 estimated presidential vote equations, one before each of the elections between 1980 and 2020. In Section 5 I have examined 11 ex ante forecasts. Each forecast uses the relevant estimated equation and the economic data that existed right before each election. These forecasts are compared to ex post forecasts using the currently estimated equation and the latest economic data. This gives one a sense, among other things, of how important the specification changes were after the 1992 election.

3 The Updated Data

The National Income and Product data available as of October 27, 2022, from the Bureau of Economic Analysis (BEA) have been used. Data prior to 1929 have been obtained, as before, from Balke and Gordon (1986). The appendix discusses the splicing of the Balke and Gordon data to the BEA data.

The vote data have been obtained when possible from the *Statistical Abstract of the United States*, various issues, and the Office of the Clerk of the U.S. House of Representatives. Some of these data are slightly different from the data used in Fair (2009), which were based on data from the CQ Press (a division of Congressional Quarterly, Inc.). The differences are small between these two data sources, but the use of the new data source does mean that some of the vote-share values used for the current update do not match exactly the values used previously. The previously used data were used when data were not available from the Office of the Clerk. The value used for the Democrat mid-term 2022 House two-party vote share, 48.4, is preliminary. It was obtained from the Cook Political Report on November 21, 2022.

4 The Updated Estimates

Tables 1 through 4 are the same as in Fair (2009) except for four more observations used. The variables are listed in Table 1. The coefficient estimates are presented in Table 2: there is one estimate for the presidential equation and two each for the on-term and mid-term House equations. The second estimate for each House equation contains restrictions on the coefficients of the economic variables based on estimates from the presidential equation. These restrictions are discussed in Fair (2009). Table 3 presents the predicted values and estimated residuals from the presidential equation and the two restricted House equations. Table 4 contains FIML estimates of the three equations.

If you compare the new Table 2 with the old Table 2 in Fair (2009), you will see that the current results are close to the previous results. In the presidential equation the coefficient estimate for $G \cdot I$ in Table 2 is 0.708, which compares to

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.

• Sample period: 1916, 1920, . . . , 2020 for the V^p and V^c equations and 1918, 1922, . . . , 2022 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}
$Index$	–	–	0.524	–	0.610
			(5.44)		(2.49)
$G \cdot I$	0.708	0.366	*0.371*	–	–
	(5.50)	(3.34)			
$P \cdot I$ or $P^{cc} \cdot I$	−0.606	−0.491	*−0.318*	−0.390	*−0.370*
	(−1.87)	(−1.84)		(−1.93)	
$Z \cdot I$ or $Z^{cc} \cdot I$	0.865	0.356	*0.453*	0.511	*0.528*
	(3.29)	(1.46)		(2.10)	
$DPER$	2.11	2.58	2.48	–	–
	(1.34)	(2.48)	(2.57)		
DUR	−3.45	–	–	–	–
	(−2.49)				
I	−0.85	−2.03	−3.03	−3.25	−3.36
	(−0.38)	(−1.25)	(−3.43)	(−2.86)	(−3.87)
WAR	3.90	0.59	1.52	0.17	0.30
	(1.41)	(0.28)	(0.88)	(0.08)	(0.17)
$CNST$	48.22	50.12	50.18	49.03	49.04
	(73.22)	(90.60)	(94.43)	(79.73)	(81.75)
$V^{cc}_{-2} - 50$	–	0.573	0.554	–	–
		(4.01)	(4.60)		
$V^{c}_{-2} - 50$	–	–	–	0.703	0.695
				(3.84)	(4.07)
$V^{p}_{-2} - 50$	–	–	–	−0.223	−0.228
				(−1.63)	(−1.75)
SE	3.01	2.45	2.37	2.44	2.39
R^2	0.849	0.794	0.786	0.763	0.763
No. obs.	27	27	27	27	27

• Estimation method: OLS; t-statistics are in parentheses.
• Estimation period: 1916–2020 for V^p and V^c, 1918–2022 for V^{cc}.
• $Index$ for V^c is $0.708 \cdot G \cdot I - 0.606 \cdot P \cdot I + 0.865 \cdot Z \cdot I$. The hypothesis that the weights in this index are correct is not rejected: F-value of 0.352, which with 2,19 degrees of freedom has a p-value of 0.704.
• $Index$ for V^{cc} is $-0.606 \cdot P^{cc} \cdot I + 0.865 \cdot Z^{cc} \cdot I$. The hypothesis that the weights in this index are correct is not rejected: F-value of 0.023, which with 1,20 degrees of freedom has a p-value of 0.878.
• 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	51.1	-0.6	48.9	50.7	1.8	45.1	44.8	-0.3	1918
1920	36.1	39.7	3.6	38.0	41.7	3.8	46.4	44.6	-1.8	1922
1924	41.7	44.2	2.4	42.1	47.3	5.2	41.6	43.2	1.6	1926
1928	41.2	43.3	2.1	42.8	43.7	0.9	45.7	47.9	2.2	1930
1932	59.1	62.2	3.0	56.9	54.1	-2.8	56.5	51.4	-5.1	1934
1936	62.2	64.0	1.8	58.5	60.8	2.4	50.8	52.1	1.3	1938
1940	55.0	55.7	0.8	53.0	55.2	2.2	47.7	46.9	-0.8	1942
1944	53.8	52.0	-1.8	51.7	51.4	-0.3	45.3	46.3	1.0	1946
1948	52.3	50.6	-1.7	53.2	49.8	-3.4	50.0	50.7	0.6	1950
1952	44.7	46.7	2.0	49.9	50.0	0.0	52.5	52.7	0.2	1954
1956	42.9	44.7	1.8	51.0	50.9	0.0	56.0	54.6	-1.4	1958
1960	50.1	48.9	-1.2	54.8	54.6	-0.1	52.5	54.2	1.7	1962
1964	61.2	60.1	-1.1	57.3	56.6	-0.7	51.2	52.9	1.7	1966
1968	49.4	51.7	2.3	50.9	51.9	1.0	54.4	53.9	-0.5	1970
1972	38.2	42.3	4.1	52.7	50.7	-2.0	58.5	57.7	-0.9	1974
1976	51.0	50.0	-1.0	56.9	56.6	-0.2	54.4	52.2	-2.2	1978
1980	44.8	46.5	1.7	51.4	50.5	-0.9	56.0	54.9	-1.1	1982
1984	40.9	39.4	-1.5	52.8	50.1	-2.7	55.1	56.1	1.1	1986
1988	46.2	49.1	2.9	54.0	54.2	0.2	54.2	55.2	1.0	1990
1992	53.6	48.5	-5.2	52.7	51.6	-1.2	46.5	48.2	1.7	1994
1996	54.7	54.0	-0.7	50.2	50.1	-0.1	49.5	47.6	-1.9	1998
2000	50.3	50.4	0.1	49.8	50.3	0.5	47.6	52.9	5.3	2002
2004	48.8	45.0	-3.8	48.6	48.3	-0.3	54.1	50.6	-3.5	2006
2008	53.7	53.4	-0.3	55.5	56.0	0.4	46.6	49.5	3.0	2010
2012	52.0	51.2	-0.8	50.7	48.6	-2.1	47.0	47.3	0.3	2014
2016	51.2	45.7	-5.4	50.5	46.4	-4.1	54.4	52.2	-2.3	2018
2020	52.2	48.8	-3.4	51.6	54.2	2.6	48.4	47.2	-1.2	2022
RMSE			2.53			2.09			2.10	

- $\hat{u}^p = \hat{V}^p - V^p$.
- $\hat{u}^c = \hat{V}^c - V^c$.
- $\hat{u}^{cc} = \hat{V}^{cc} - V^{cc}$.
- RMSE = root mean squared error, not adjusted for degrees of freedom.

Table 4
Full Information
Maximum Likelihood Estimates

	Eq. 1 V^p	Eq. 2a V^c	Eq. 3a V^{cc}
$G \cdot I$	0.707	0.359	–
	(6.66)	(5.08)	
$P \cdot I$ or $P^{cc} \cdot I$	−0.653	*−0.331*	−0.295
	(−2.82)		(−1.90)
$Z \cdot I$ or $Z^{cc} \cdot I$	0.848	*0.430*	*0.382*
	(4.03)		
$DPER$	2.13	2.89	–
	(1.61)	(3.45)	
DUR	−3.40	–	–
	(−3.17)		
I	−0.67	−3.03	−2.75
	(−0.39)	(−3.36)	(−3.13)
WAR	3.62	1.36	0.11
	(1.63)	(0.93)	(0.07)
$CNST$	48.21	50.20	49.36
	(87.42)	(108.23)	(85.30)
$V^{cc}_{-2} - 50$	–	0.537	–
		(5.48)	
$V^{c}_{-2} - 50$	–	–	0.592
			(3.36)
$V^{p}_{-2} - 50$	–	–	−0.170
			(−1.36)
SE	2.53	2.10	2.21
No. obs.	27	27	27

• 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.
• SE's are not adjusted for degrees of freedom.
• Values in italics are implied values.

the estimate of 0.680 in Fair (2009). For $P \cdot I$ the comparison is -0.606 versus -0.657. For $Z \cdot I$ the comparison is 0.865 versus 1.075. Of the non economic variables, the coefficient estimate of $DPER$ is 2.11 versus 3.30 earlier, and the coefficient estimate of DUR is -3.45 versus -3.33 earlier. Although the sample size is too small for stability tests, the small changes from adding four observations is encouraging. Not all coefficient estimates are significant at conventioanal levels, but this may reflect in part the small sample size.

Regarding the two House equations, the coefficient restrictions are still strongly supported by the data (see the footnotes to Table 2). It is also the case that adding the four observations had modest effects on the coefficient estimates. For example, for equation 2a the current estimate for $Index$ is 0.524 versus 0.584 earlier. For equation 3a, the current estimate for $Index$ is 0.610 versus 0.528 earlier. Both estimates are significant, which is a test of the significance of the economic variables.

Although not shown here, all the robustness tests discussed in Fair (2009) were repeated, with no change in any of the conclusions. The estimated standard error is 3.0 percentage points for the presidential equation and about 2.4 percentage points for the two House equations.

Looking at the estimated residuals in Table 3, the largest two errors for the presidential equation are -5.2 in 1992 (W. Clinton > G. H. Bush) and -5.4 in 2016 (H. Clinton versus Trump). The errors for 1996, 2000, 2008, and 2012 are all close to zero. The landslide elections are predicted quite well—1920, 1924, 1928, 1932, 1936, 1956, 1964, 1972, and 1984. The reasons for these accurate predictions can be seen by examining the economic variables relevant to each election.

The error for 2016 is interesting. The Democrats were predicted to lose with only 45.7 percent of the two-party vote. They in fact got 51.2 percent of the vote, although lost in the electoral college. The Democrats did much better in 2016 than the equation predicted even though they lost. The Democrats also did better than predicted in the 2020 presidential election, but this time winning. They were predicted to get 48.8 percent, and they actually got 52.2 percent, for an error of -3.4 percentage points. It could be that some of the poor predicted performance of the Republicans in 2016 and 2020 was because of Trump, but this is not testable.

The errors for the two House equations are on average slightly smaller in absolute value than the errors for the presidential equation.

5 Ex Ante versus Ex Post Forecasts

As noted in Section 2, 11 estimated presidential equations can be examined, one for each of the elections between 1980 and 2022. Beginning with the 1996 election, the last forecast before the election is available from my website. In each case this forecast uses the actual economic data that were known at the time (no predicted economic data are needed right before the election). For the elections of 1984, 1988, and 1992, tables of vote forecasts were presented in the respective papers—Fair (1982, 1988, 1990)—for different values of the economic variables. For present purposes I took the values of the economic variables that were available right before the election (from past issues of the *Survey of Current Business*) and chose the relevant vote forecast from the tables. Interpolation was used to get the exact forecast. For the 1980 election I used the equation in row 4 of Table 2 in Fair (1978).

The ex ante forecasts of the 11 presidential elections are presented in Table 5 along with the ex post forecasts from Table 3. The ex post forecasts use the estimated equation in Table 2—equation 1—and the latest revised economic data. The mean absolute error (MAE) for the 11 ex ante errors is 3.94, which compares to 2.35 for the ex post errors. As with the ex post errors, the two largest ex ante errors are -10.5 for 1992 and -7.2 for 2016. In these two elections the Democrats did considerably better than predicted. The next two largest ex ante errors are in 2004 and 2020, -6.5 and -4.3 percentage points respectively.

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

		Ex Ante		Ex Post		
	Act.	**Pred.**	**Error**	**Pred.**	**Error**	**Outcome**
Presidential Equation						
1980	44.8	46.4	1.6	46.5	1.7	Carter < Reagan
1984	40.9	43.2	2.3	39.4	-1.5	Mondale < Reagan
1988	46.2	48.1	1.9	49.1	2.9	Dukakis < G.H.Bush
1992	53.6	43.1	-10.5	48.5	-5.2	w.Clinton > G.H.Bush
1996	54.7	51.0	-3.7	54.0	-0.7	W.Clinton > Dole
2000	50.3	50.8	0.5	50.4	0.1	Gore vs G.W.Bush
2004	48.8	42.3	-6.5	45.0	-3.8	Kerry < G.W.Bush
2008	53.7	51.9	-1.8	53.4	-0.3	Obama > McCain
2012	52.0	49.0	-3.0	51.2	-0.8	Obama > Romney
2016	51.2	44.0	-7.2	45.7	-5.4	H.Clinton vs Trump
2020	52.2	47.9	-4.3	48.8	-3.4	Biden > Trump
MAE			3.94		2.35	
On-Term House Equation						
2008	55.5	55.8	0.3	56.0	0.4	
2012	50.7	46.0	-4.7	48.6	-2.1	
2016	50.5	45.0	-5.5	46.4	-4.1	
2020	51.6	54.2	2.6	54.2	2.6	
MAE			3.28		2.30	
Mid-Term House Equation						
2010	46.6	49.2	2.6	49.5	3.0	
2014	47.0	50.9	3.9	47.3	0.3	
2018	54.4	50.7	-3.7	52.2	-2.3	
2022	48.4	46.6	-1.8	47.2	-1.2	
MAE			3.00		1.70	

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

As noted in Section 2, some specification changes were made to the presidential equation after the 1992 election, but from 1996 on the specification has remained the same—unchanged for 7 elections and 28 years!

There are four ex ante forecasts available for the on-term House election and the mid-term House election. These are presented in Table 5 along with the ex post forecasts from Table 3. The MAEs for the ex ante errors are 3.28 for the on-term election and 3.00 for the mid-term election, which compare to 2.30 and 1.70 for the ex post errors. The largest error is for the 2016 election, where the Democrats got 50.5 percent of the two-party vote and were predicted to get only 45.0 percent. The mid-term House election in 2022 was predicted well. The Democrats got 48.4 percent of the two-party vote and were predicted to get 46.6 percent.

6 Forecasts for 2024

The values of the non economic variables for 2024 are $I = 1$ (the Democrats are in power), $DPER = 1$ (assuming Biden runs), $DUR = 0.00$ (the Democrats have not been in power for two or more consecutive terms), $WAR = 0$, and $V^{cc} = 48.4$. This latter variable is needed for the 2024 on-term House vote. Using these values, equations 1 and 2a in Table 2 can be written for 2024 as:

$$V^p = 49.48 + 0.708 \cdot G - 0.606 \cdot P + 0.865 \cdot Z$$

$$V^c = 48.74 + 0.371 \cdot G - 0.318 \cdot P + 0.453 \cdot Z$$

The constant terms incorporate the non economic values just mentioned. Remember that these assume that Biden is running again. The terms will not change unless Biden does not run again.

Given forecasts of the three economic variables, predictions of the vote shares can be made. Using actual values through 2022.3 and forecast values from the US model on this site for 2022.4–2024.3, the values for G, P, and Z are 1.70, 4.83, and 3, respectively. These give a predicted value of 50.35 for V^p and 49.19 for V^c. In short, roughly a 50/50 prediction for both the presidency and the House.

To give an idea of the sensitivity of the presidential predictions, if Biden does not run this subtracts 2.13 percent from the Democratic vote share. For every one percentage point change in G, the growth rate of real per capita GDP in the first three quarters of 2024 at an annual rate, the Democratic vote share changes by about 0.7 percentage points. For every one percentage point change in P, the growth rate of the GDP deflator between 2021.1 and 2024.3 at an annual rate, the Democratic vote share changes by about 0.6 percentage points in the opposite direction. For a change in Z of 1, the Democratic vote changes by about 0.9 percentage points. You can use the site to make your own prediction of the vote share for different values of the economic variables.

Data Appendix

The data used in this paper are presented in Table A. Quarterly data on nominal GDP, real GDP, and population are needed to construct G, G^{cc},P, Z, P^{cc}, and Z^{cc}. Let GDP denote nominal GDP, let $GDPR$ denote real GDP, and let POP denote population. Let a subscript k denote the kth quarter of the sixteen-quarter period of an administration. Also, let $Y = GDPR/POP$, which is real per capita GDP, and let $GDPD = GDP/GDPR$, which is the GDP deflator. Then G, G^{cc}, P, and P^{cc} are constructed as:

$$G = [(Y_{15}/Y_{12})^{(4/3)} - 1] \cdot 100$$
$$G^{cc} = [(Y_7/Y_4)^{(4/3)} - 1] \cdot 100$$
$$P = [(GDPD_{15}/GDPD_{16}(-1))^{(4/15)} - 1] \cdot 100$$
$$P^{cc} = [(GDPD_7/GDPD_{16}(-1))^{(4/7)} - 1] \cdot 100$$

where (-1) means the previous four-year election period. To construct Z and Z^{cc} one needs to define the growth rate in a given quarter, which for quarter k is $g_k = [(Y_k/Y_{k-1})^4 - 1] \cdot 100$ for quarters 2 through 16 and $g_k = [(Y_1/Y_{16}(-1))^4 - 1] \cdot 100$ for quarter 1. Z is then the number of quarters in the first 15 quarters of an administration in which g_k is greater than 3.2, and Z^{cc} is $\frac{15}{7}$ times the number of quarters in the first 7 quarters of an administration in which g_k is greater than 3.2.

The data on nominal GDP were obtained as follows. Annual data for 1929–1946 and quarterly data for 1947:1–2014:3 were obtained from the Bureau of Economic Analysis (BEA) website on October 27, 2022. Quarterly data for 1913:1–1946:4 are available from Balke and Gordon (1986), pp. 789–795. The Balke and Gordon values for 1913:1–1928:4 were used exactly, but the values for 1929:1–1946:4 were adjusted to take account of the BEA annual data. For 1929:1–1946:4 each quarterly value for a given year was multiplied by a splicing factor for that year. The splicing factor is the ratio of the BEA value for that year to the respective yearly value in Balke and Gordon (1976), pp. 782–783.

The data on real GDP were obtained in a similar way. Annual data for 1929–1946 and quarterly data for 1947:1–2022:3 were obtained from the BEA website on October 27, 2022. Quarterly data for 1913:1–1946:4 are available from Balke and Gordon (1986), pp. 789–795. The Balke and Gordon values were spliced to the BEA values. All the Balke and Gordon quarterly values for 1913:1–1929:4 were multiplied by the same number. This number is the ratio of the BEA value for 1929 to the 1929 value in Balke and Gordon (1976), p. 782. For 1930:1–1946:4 each Balke and Gordon quarterly value for a given year was multiplied by a splicing factor for that year. The splicing factor is the ratio of the BEA value for that year to the respective yearly value in Balke and Gordon (1976), pp. 782–783.

The data on population were obtained as follows. For 1913–1928 annual data were obtained from U.S. Department of Commerce (1973), pp. 200–201, A114 series. Each of these observations was multiplied by 1.000887, a splicing factor. The splicing factor is the ratio of the A114 value for 1929 in U.S. Department of Commerce (1973) to the value for 1929 in Table 8.2 in U.S. Department of Commerce (1992). For 1929–1945 annual data were obtained from U.S. Department of Commerce (1992), Table 8.2. Quarterly observations for 1877:1–1945:4 were obtained by interpolating the annual observations using the method presented in Fair (1994), Table B.6. For 1946:1–1946:4 quarterly data were obtained from the BEA website on October 27, 2006. For 1947:1–2022:3 quarterly data were obtained from the BEA website on October 27, 2022.

Turning now to the vote data, V^p is the Democratic vote divided by the Democratic plus Republican vote except for the 1924 election. For 1924, V^p is the Democratic vote plus 0.765 times the LaFollette vote divided by the Democratic plus Republican plus LaFollette vote. The presidential vote data for 1916 were obtained from U.S. Department of Commerce (1975), pp. 1078–1079. Data for the elections after 1916 were obtained from past issues of the *Statistical Abstract of the United States* and from the website of the Office of the Clerk of the U.S. House of Representatives.

V^c and V^{cc} are the Democratic House vote divided by the Democratic plus Republican House vote. No adjustments were made to these data. The vote data were obtained when possible from the website of the Office of the Clerk of the U.S. House of Representatives. Most of the data from 1930 on were available from this website. When data were not available, past issues of the *Statistical Abstract of the United States* were tried, working from the most recent back. When data from this source were not available, the data were obtained from U.S. Department of Commerce (1975), p. 1084. The value of V^{cc} of 0.484 for 2022 is preliminary.

I, $DPER$, DUR, and WAR are defined in the text. In the construction of $DPER$ Ford is not counted as an incumbent running again, since he was not an elected vice president, whereas the other vice presidents who became president while in office are counted.

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	-14.361	6.926	4
1936	62.226	58.476	1	1	0.00	0	11.616	2.467	9
1940	54.983	52.967	1	1	1.00	0	3.963	0.041	8
1944	53.778	51.718	1	1	1.25	1	4.067	0.000	0
1948	52.319	53.190	1	1	1.50	1	3.351	0.000	0
1952	44.710	49.944	1	0	1.75	0	1.031	2.367	7
1956	42.906	50.970	-1	-1	0.00	0	-1.250	1.894	5
1960	50.087	54.790	-1	0	-1.00	0	0.645	1.972	5
1964	61.203	57.324	1	1	0.00	0	5.098	1.234	9
1968	49.425	50.921	1	0	1.00	0	5.109	3.086	7
1972	38.209	52.660	-1	-1	0.00	0	5.863	4.812	4
1976	51.049	56.850	-1	0	-1.00	0	3.827	7.476	5
1980	44.842	51.383	1	1	0.00	0	-3.596	7.827	5
1984	40.877	52.778	-1	-1	0.00	0	5.437	5.277	8
1988	46.168	54.011	-1	0	-1.00	0	2.343	2.817	4
1992	53.621	52.744	-1	-1	-1.25	0	3.053	3.210	3
1996	54.737	50.158	1	1	0.00	0	3.300	2.040	4
2000	50.262	49.819	1	0	1.00	0	2.013	1.644	7
2004	48.767	48.632	-1	-1	0.00	0	2.187	2.115	2
2008	53.689	55.535	-1	0	-1.00	0	-1.387	2.717	2
2012	52.010	50.681	1	1	0.00	0	1.181	1.421	2
2016	51.163	50.546	1	0	1.00	0	1.245	1.349	2
2020	52.249	51.556	-1	-1	0.00	0	-3.508	1.828	2

• The values of P for 1920, 1944, and 1948 before multiplication by zero are 16.535, 5.478, and 8.718, 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	-11.194	2.077	4.2857
1934	56.509	1	0	12.767	3.966	8.5714
1938	50.815	1	0	4.601	0.089	6.4286
1942	47.664	1	1	16.069	0.000	0.0000
1946	45.277	1	1	-4.428	0.000	0.0000
1950	50.044	1	0	13.434	0.198	6.4286
1954	52.537	-1	0	-0.720	0.785	2.1429
1958	55.983	-1	0	-1.167	2.711	2.1429
1962	52.492	1	0	3.800	1.091	10.7143
1966	51.250	1	0	3.771	2.574	10.7143
1970	54.403	-1	0	0.019	5.022	2.1429
1974	58.530	-1	0	-2.955	8.121	4.2857
1978	54.416	1	0	5.945	6.711	8.5714
1982	55.994	-1	0	-2.868	7.223	4.2857
1986	55.085	-1	0	2.258	2.352	2.1429
1990	54.177	-1	0	0.838	3.828	4.2857
1994	46.476	1	0	2.716	2.207	4.2857
1998	49.533	1	0	3.141	1.362	6.4286
2002	47.562	-1	0	1.542	1.793	0.0000
2006	54.120	-1	0	1.387	3.199	4.2857
2010	46.561	1	0	2.196	0.730	2.1429
2014	46.973	1	0	2.026	1.824	4.2857
2018	54.447	-1	0	2.284	2.205	2.1429
2022	48.400	1	0	-0.160	6.558	6.4286

- 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.

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