THE EFFECT OF ECONOMIC EVENTS ON VOTES FOR PRESIDENT: 1992 Update

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This article updates through the 1992 election the equation originally presented in Fair (1978) explaining votes for president. Conditional predictions of the 1996 election are also made.

This article updates through the 1992 election the equation originally presented in Fair (1978) explaining votes for president. Previous updates are in Fair (1982, 1988, 1990). The equation made a large error in predicting the 1992 election (as will be seen), and much of this article is concerned with this problem. The new results suggest that in forming expectations voters look back further than the old results suggested they did.

The general model that is behind the equation is reviewed in Section 1, and the data that have been used are discussed in Section 2. The equation is then updated, estimated, and tested in Section 3. Section 4 contains predictions of the 1996 election, conditional on the state of the economy, and Section 5 concludes with some caveats.

1. A REVIEW OF THE GENERAL MODEL[1]

The main aim of the work in Fair (1978) was to provide a framework that is general enough to encompass a number of theories of voting behavior. Assume that there are only two political parties, Democratic (D) and Republican (R), and consider a presidential election held at time t. (An election held at time t will be referred to as election t.) Let U_{it}^{D} denote voter i's expected future utility if the Democratic candidate is elected, and let U_{it}^{R} denote the same thing if the Republican candidate is elected. These expectations should be considered as being made at time t. Let V_{it} be a variable that is equal to 1

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if voter i votes for the Democratic candidate and to 0 if voter i votes for the Republican candidate. The first main postulate of the model is that

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

Let $td1$ denote the last election looking backward from t that the Democratic party was in power; let $td2$ denote the second-to-last election from t that the Democratic party was in power; let $tr1$ and $tr2$ denote the same things for the Republican party; and let M_j denote some measure of economic performance of the party in power during the four years[2] prior to election j. If the Democratic party was in power at time t, then $td1$ is equal to t; otherwise $tr1$ is equal to t. The second main postulate of the model is that

$$U_{it}^D = \xi_i^D + \beta_1 \frac{M_{td1}}{(1+\rho)^{t-td1}} + \beta_2 \frac{M_{td2}}{(1+\rho)^{t-td2}} \tag{2}$$

$$U_{it}^R = \xi_i^R + \beta_3 \frac{M_{tr1}}{(1+\rho)^{t-tr1}} + \beta_4 \frac{M_{tr2}}{(1+\rho)^{t-tr2}} \tag{3}$$

where β_1, β_2, β_3, and β_4 are unknown coefficients and ρ is an unknown discount rate. The ξ_i^D and ξ_i^R variables are specific to voter i and are assumed not to depend on any M_j variables.

Three further "aggregation" assumptions are needed to allow an aggregate voting equation to be estimated. The first is that the coefficients β_1, β_2, β_3, β_4, and ρ in equations 2 and 3 are the same for all voters and that all voters use the same measure of performance. Differences across voters are reflected only in the ξ_i^D and ξ_i^R variables.

To discuss the second and third aggregation assumptions, let

$$\psi_i = \xi_i^R - \xi_i^D \tag{4}$$

$$q_t = \beta_1 \frac{M_{td1}}{(1+\rho)^{t-td1}} + \beta_2 \frac{M_{td2}}{(1+\rho)^{t-td2}} - \beta_3 \frac{M_{tr1}}{(1+\rho)^{t-tr1}} - \beta_4 \frac{M_{tr2}}{(1+\rho)^{t-tr2}} \tag{5}$$

Using these definitions and equations 2 and 3, equation 1 can be written:

$$V_{it} = \begin{cases} 1 & \text{if } q_t > \psi_i \\ 0 & \text{otherwise} \end{cases} \tag{6}$$

The second aggregation assumption is that ψ_i is evenly distributed across voters in each election between $a + \delta_t$ and $b + \delta_t$, where $a < 0$ and $b > 0$. δ_t is specific to election t, but a and b are constant across all elections. The third aggregation assumption is that there is an infinite number of voters in each election. The last two assumptions imply that ψ is uniformly distributed between $a + \delta_t$ and $b + \delta_t$, where the i subscript is now dropped from ψ_i. The probability density function for ψ is $1/(b - a)$ for $a + \delta_t < \psi < b + \delta_t$ and 0 otherwise. The cumulative distribution function for ψ is $(\psi - a - \delta_t)/(b - a)$ for $a + \delta_t \leq \psi \leq b + \delta_t$, 0 for $\psi < a + \delta_t$, and 1 for $\psi > b + \delta_t$.

Let V_t denote the Democratic share of the two-party vote in election t. From the above assumptions, V_t is equal to the probability that ψ is less than or equal to q_t. The probability that ψ is less than or equal to q_t is merely the cumulative distribution function evaluated at q_t, so that

$$V_t = -\frac{a}{b-a} + \frac{q_t}{b-a} - \frac{\delta_t}{b-a} \tag{7}$$

It will be convenient to rewrite equation 7 as

$$V_t = \alpha_0 + \alpha_1 q_t + v_t \tag{8}$$

where $\alpha_0 = -a/(b-a)$, $\alpha_1 = 1/(b-a)$, and $v_t = -\delta_t/(b-a)$. Finally, combining equations 5 and 8 yields:

$$\begin{aligned} V_t = \alpha_0 + \alpha_1\beta_1 \frac{M_{td1}}{(1+\rho)^{t-td1}} + \alpha_1\beta_2 \frac{M_{td2}}{(1+\rho)^{t-td2}} \\ - \alpha_1\beta_3 \frac{M_{tr1}}{(1+\rho)^{t-tr1}} - \alpha_1\beta_4 \frac{M_{tr2}}{(1+\rho)^{t-tr2}} + v_t \end{aligned} \tag{9}$$

Equation 9 is the basic equation of the model. Given assumptions about the measure of performance and about v_t, the equation can be estimated.

The empirical work in Fair (1978) consisted of estimating equation 9 under different assumptions about M and v_t. For much of this work, v_t was postulated to be

$$v_t = \alpha_2 t + \alpha_3\, DPER_t + u_t \tag{10}$$

where t is a time trend, $DPER_t$ is a dummy variable that is 1 if there is a Democratic incumbent running for election, -1 if there is a Republican incumbent running for election, and 0 otherwise, and u_t is an error term.

The measure of performance M_j can be assumed to be a function of more than one variable. Assume that M_j is a linear function of three variables, X_j, Y_j, and Z_j:

$$\begin{aligned} M_j &= \gamma_1(X_j - X^*) + \gamma_2(Y_j - Y^*) + \gamma_3(Z_j - Z^*) \\ &= (-\gamma_1 X^* - \gamma_2 Y^* - \gamma_3 Z^*) + \gamma_1 X_j + \gamma_2 Y_j + \gamma_3 Z_j \\ &= \gamma_0 + \gamma_1 X_j + \gamma_2 Y_j + \gamma_3 Z_j \end{aligned} \tag{11}$$

where $\gamma_0 = -\gamma_1 X^* - \gamma_2 Y^* - \gamma_3 Z^*$. X^*, Y^*, and Z^* can be thought of as "norms." If, for example, γ_1 is positive, then values of X_j above its norm have a positive effect on the measure of performance, and conversely for values of X_j below its norm. If the norms are constant across time, which is assumed here, they are absorbed in the constant term, γ_0, in equation 11.[3]

In the empirical work in Fair (1978) the hypothesis that $\beta_1 = \beta_3$ was tested and accepted. In addition, the estimates of ρ were very large, and for practical purposes they were infinite. If $\beta_1 = \beta_3$ and ρ is infinite, equation 9 becomes[4]

$$V_t = \alpha_0 + \alpha_1 \beta_1 M_t I_t + v_t \tag{12}$$

where I_t equals 1 if there is a Democratic incumbent and -1 if there is a Republican incumbent. Substituting equations 10 and 11 into 12 yields:

$$V_t = \alpha_0 + \alpha_1\beta_1\gamma_0 I_t + \alpha_1\beta_1\gamma_1 X_t I_t + \alpha_1\beta_1\gamma_2 Y_t I_t + \alpha_1\beta_1\gamma_3 Z_t I_t + \alpha_2 t + \alpha_3\, DPER_t + u_t \tag{13}$$

2. THE DATA

Economic Data

The appendix lists the data sources for each variable used in this article. Even though the basic estimation period in this article begins in 1916, some estimates were made using earlier observations, and the appendix gives sources for the data as far back as 1873. The data are presented in Table A.

There are two main differences between the data used here and the data used in the earlier articles. First, in the period prior to 1946 quarterly GDP[5] data are used here, whereas in the earlier work only annual data were used for this period. The quarterly data were taken from Balke and Gordon (1986), who constructed the data by interpolation using the Chow–Lin (1971) method and various quarterly interpolators.[6] Second, chain-link price indices were used to deflate nominal GDP for the 1959:1–1992:4 period, whereas in the earlier work the GDP deflator was used. As discussed in Fair (1994), Section 3.2.2, the use of the chain-link price indices avoids problems associated with using fixed weights over long periods of time.[7]

Treatment of Third-Party Votes

In the earlier articles the votes for Davis and LaFollette in 1924 were added together and counted as Democratic. However, the analysis in Burner

(1971), p. 2488, suggests that LaFollette may have taken only about three-fourths of his votes from the Democrats. The Republicans got 58 percent of the House vote and the Democrats 42 percent. Coolidge got 54 percent of the votes for president, compared to 29 percent for Davis and 17 percent for LaFollette. If it is assumed that Coolidge would have gotten 58 percent if LaFollette had not run (the same percentage as the House vote), then LaFollette took 23.5 percent (4/17) from Coolidge and 76.5 percent (13/17) from Davis. Consequently, V for 1924 was taken to be $(VD + .765 \times V3)/(VD + VR + V3)$, where VD is the Democratic vote, VR is the Republican vote, and $V3$ is the vote for LaFollette.

The 1924 election is the only election since 1916 in which a third-party adjustment was made. By not making an adjustment for an election, it is implicitly assumed that the percentage of the third-party votes taken from the Democrats is the same as the Democratic share of the two-party vote. For example, Clinton got 53.5 percent of the two-party vote in 1992, and there were 20.412 million third-party votes, mostly for Perot. If it is assumed that Clinton would have received 53.5 percent of the third-party votes had there been no third-party candidates, his share of the *total* vote would also have been 53.5 percent. Haynes and Stone (1994), fn. 2, p. 125, cite exit polls suggesting that Perot took about equal amounts from both Clinton and Bush, which is close to the implicit assumption made here of 53.5 percent being taken from Clinton.[8]

It should be stressed that strong third-party candidates pose a potential problem for a study like the present one. If, for example, one were to assume that Perot took all his votes from Bush and thus were to use as the Republican vote the sum of the Bush and Perot votes, the equation would no longer show a large prediction error for 1992. While this would clearly be an extreme assumption, Ladd (1993) suggests that Perot may have taken most of his votes from Bush. Some assumption about third-party votes has to be made in a study like this, and in the following analysis one should be aware of what has been assumed here, particularly that Perot took about equal amounts from Bush and Clinton in 1992. Fortunately (for the analysis) most elections have not had strong third-party candidates.

3. ESTIMATES AND TESTS OF THE EQUATION

The basic equation estimated in the last update—Fair (1990)—used as the two measures of performance the growth rate (at an annual rate) of real, per capita GDP in the second and third quarters of the election year ($g2$) and the absolute value of the growth rate (at an annual rate) of the GDP deflator in the eight quarters before the election ($p8$).[9] This equation corresponds to equation 13 with $g2$ as X, $p8$ as Y, and no Z.[10] The estimation period was 1916–1988. This equation will be called the "1988 equation." Using the actual values of $g2$ and $p8$ for the 1992 election (1.10 and 3.32 percent, respectively) and the coefficient estimates in Fair (1990), the 1988 equation predicts a value of V of .437, a substantial Democratic loss. The actual value is .535, and so the prediction error is .098. This error is 3.3 times the estimated standard error of the equation, .0296, and it is far larger than any of the within-sample prediction errors for the 19 elections in the 1916–1988 period.

A puzzling feature about the large error for 1992 is that the economy clearly seemed to be a key issue in the 1992 election, probably the key issue. This suggests that the equation should have done well, since the theory behind the equation is that the economy affects voting behavior. It must be that whatever aspects of the economy voters were focusing on in 1992, they were not captured well by $g2$ and $p8$.

In what follows I use the updated data discussed in Section 2 and information learned from the 1992 election to try to improve the explanatory power of the equation. Much of the focus is on developing alternative measures of economic performance. Within the context of the general model in Section 1, all of the estimation work was done under the assumption that $\beta_1 = \beta_3$ and ρ is infinite. The tests regarding β_1, β_3, and ρ made in Fair (1978) were not repeated here.[11]

Updated Data

The use of the updated data made a noticeable difference to the 1988 equation even for the original estimation period of the equation, 1916–1988. The time trend became insignificant, with its coefficient estimate going from .0036 with a t-statistic of 1.97 to $-.0007$ with a t-statistic of -0.35. The coefficient estimate for $g2$ went from .0104 with a t-statistic of 5.30 to .0042 with a t-statistic of 2.49, and the coefficient estimate for $p8$ went from $-.0031$ with a t-statistic of -1.07 to $-.0070$ with a t-statistic of -2.12. The other three coefficient estimates had noticeable changes as well. The fit of the equation using the updated data was not as good, with a standard error of .0325, and it had a larger outside-sample prediction error for 1992—.120 versus .098. Further estimation revealed that the main cause of these differences was not the different treatment of the third party in 1924 but the use of the updated GDP data—the quarterly data prior to 1946 and the chain-link data from 1959 on. Given these results, the time trend was dropped from the equation for the further estimation work.

It should be noted that by using the latest updated data, it is implicitly assumed that compared to the old data these data better approximate the economic conditions known to the voters at the time. If voters look at the economic conditions around them and not at the numbers themselves, which is assumed here, then one should always attempt to collect the most accurate data.

n, the Number of Quarters of Good News

Surveys of consumer sentiment and voter attitudes in 1991 and 1992 revealed that people were quite pessimistic about the economy. Why were people so unhappy about the economy at the time of the election in 1992, given that the inflation rate was low and the growth rate in the first three quarters of 1992 was 1.5 percent and thus nowhere near recession values? One might have thought that people would have been at least neutral. Many answers have been suggested as to why people seemed so upset at Bush about the economy. Maybe people felt that Bush was not particularly interested in the economy; maybe they were concerned with increased foreign competition; maybe the fact that white-collar workers were hit harder than usual in the 1990–1991 recession increased the general gloom; maybe the press was too negative and convinced people that times were worse than they really were; and maybe people were concerned about a perceived growing income inequality and a lack of "good jobs at good wages."

Answers like the above are all plausible, but they are hard to test. In the present context one needs a variable for which observations can be collected back to the election of 1916. As I lived through the 1989–1992 period, it struck me that there was no quarter within the overall fifteen-quarter period before the 1992 election in which the economic news was good in terms of a high growth rate. The news was either just okay or bad, as during the 1990–1991 recession. Most other fifteen-quarter periods seemed to have at least some quarters of good news even if the overall period was not good. Maybe by the end of 1991 the lack of good news for at least three years began to wear on people and thus led to their gloom. This gloom could then have continued into 1992, where there was no good news, in terms of a high quarterly growth rate, until the fourth quarter of 1992.

To test this idea, a "good news" variable, denoted n, was constructed. This variable is the number of quarters of the first fifteen quarters of each period of a presidential administration in which the growth rate is greater than r percent. In the estimation work, values of r of between 2.0 and 4.0 were tried in increments of .1, and the value of 2.9 gave the best fit. n is thus defined here for $r = 2.9$. A variable was also tried that was the same as n except that the first four quarters of each administration were excluded. This variable was dominated by n in the sense that when both variables were included in the equation, n was significant and the other variable was not.

Table A in the appendix shows that n is 0 for the Bush administration, the only administration in the table for which this is true. More will be said below about the results using n. (As discussed below, n was not used for the elections of 1920, 1944, and 1948.)

How Far Back Do Voters Look in Forming Future Expectations?

A key question of interest is how much history voters use in forming their expectations of the future economic performance of a particular party. In previous work on the equation it appeared that voters were quite myopic, focusing only on growth in the two or three quarters before the election and on inflation in the two-year period before the election. In the current work, however, the fact (as will be seen) that n is an important explanatory variable suggests that voters may look back over the whole fifteen-quarter period in forming expectations of how the incumbent party would do in the future. This is further supported in the current work by the fact (as will be seen) that $p15$, the absolute value of the inflation rate in the fifteen quarters before the election, dominates $p8$. ($p15$ was thus used in place of $p8$ in the final version.)[12]

Regarding the growth-rate variable, in previous work the data have not been able to discriminate between the growth rate in the second and third quarters of the election year, $g2$, and the growth rate in the first, second, and third quarters of the election year, $g3$. In the current work, however, $g3$ was significant and $g2$ was not when both were included in the equation. Likewise, $g3$ dominated $g4$, where $g4$ is the growth rate in the four quarters before the election. $g3$ was thus chosen for the final version. The fact that $g3$ is an important explanatory variable suggests that even though voters may look back the full fifteen quarters in helping form their expectations (as reflected in n and $p15$), events in the year of the election are given special weight (as reflected in $g3$).

The Elections of 1920, 1944, and 1948

In looking at economic-performance measures, it is hard to know what to do about the war years. The fifteen-quarter period before the 1920 election is dominated by World War I, and the fifteen-quarter periods before the 1944 and 1948 elections are dominated by World War II. These periods may differ in kind from the other periods. To try to account for this problem, the assumption was made that the coefficients for inflation ($p15$) and good news (n) are zero for these three elections. Voters are assumed to consider the other variables in the equation, including $g3$, but not n and $p15$. As will be seen below, this assumption leads to one extra coefficient being estimated. The new variable introduced for this specification is $DWAR$, which is 1 for the 1920, 1944, and 1948 elections and 0 otherwise.

Incumbency Variables

Another tack for improving the equation may be to broaden the group of incumbency variables used. (The two used in equation 13 are I and $DPER$.) In particular, the studies of Abramowitz (1988), Campbell and Wink (1990), Haynes and Stone (1994), and Fackler and Lin (1994) have used some measure of how long a party has been in the White House without a break to help explain votes for president. It is argued that, other things being equal, voters eventually get tired of a party if it has been in power a long time. For the work here five versions of a duration variable, denoted DUR, were tried. The general version of DUR was taken to be 0 if the incumbent party has been in power for only one or two consecutive terms, 1 $[-1]$ if the Democratic [Republican] party has been in power for three consecutive terms, $1 + k$ $[-(1 + k)]$ if the Democratic [Republican] party has been in power for four consecutive terms, $1 + 2k$ $[-(1 + 2k)]$ if the Democratic [Republican] party has been in power for five consecutive terms, and so on. In the empirical work, values of k of 0, .25, .5, .75, and 1.0 were tried, and the best results were obtained for a value of .25. DUR is thus defined here for $k = .25$.

The Final Version[13]

To summarize, the final version of the equation differs from the 1988 equation in the following ways: (1) the time trend is dropped, (2) $g3$ replaces $g2$, (3) $p15$ replaces $p8$, (4) n is added, (5) the coefficients of $p15$ and n are assumed to be 0 for the 1920, 1944, and 1948 elections (the "war" elections), and (6) DUR is added.

The assumption that the coefficients of $p15$ and n are zero for the war elections means that these variables enter the equation as $p15 \cdot I \cdot (1 - DWAR)$ and $n \cdot I \cdot (1 - DWAR)$. In addition, the constant term in equation 11 is different for the three war elections (because γ_2 and γ_3 are 0 for the war elections and these coefficients make up part of the constant term). Denote the constant term for the three war elections as γ_0'. Then the new term added to equation 13 is $\alpha_1\beta_1\gamma_0' I_t DWAR_t$. The assumption about the war elections thus leads to one extra coefficient being estimated. The final version of equation 13 is thus

$$V_t = \alpha_0 + \alpha_1\beta_1\gamma_0 I_t + \alpha_1\beta_1\gamma_0' I_t DWAR_t + \alpha_1\beta_1\gamma_1 g3_t I_t + \alpha_1\beta_1\gamma_2 p15_t I_t(1 - DWAR_t) + \alpha_1\beta_1\gamma_3 n_t I_t(1 - DWAR_t) + \alpha_3 DPER_t + \alpha_4 DUR_t + u_t \quad (14)$$

The Estimates

The results of estimating equation 14 for three sample periods, 1916–1992, 1916–1988, and 1916–1960, are presented in Table 1. All the coefficient estimates are significant for the first sample period except for the coefficient of I. (The coefficient of I simply reflects the constant term in equation 11 for the nonwar elections.) The coefficient estimates are .0065 for $g3$, $-.0083$ for $p15$, and .0099 for n. Thus, an increase of 1 percentage point in the growth rate in the three quarters before the election increases the vote share by .65 percentage points, and an increase of 1 percentage point in the inflation rate over the

TABLE 1. Estimates of Equation 14

$$V = a_1 + a_2 I + a_3 I \cdot DWAR + a_4 g3 \cdot I + a_5 p15 \cdot I \cdot (1 - DWAR) + a_6 n \cdot I \cdot (1 - DWAR) + a_7 DPER + a_8 DUR$$

Sample:	1916–1992	1916–1988	1916–1960
a_1	.468	.466	.463
	(90.62)	(124.05)	(88.08)
a_2	−.034	−.015	−.028
	(−1.26)	(−0.75)	(−1.31)
a_3	.047	.016	.031
	(2.09)	(0.88)	(1.50)
a_4	.0065	.0070	.0076
	(8.03)	(11.60)	(8.95)
a_5	−.0083	−.0093	−.0066
	(−3.40)	(−5.21)	(−1.98)
a_6	.0099	.0064	.0068
	(4.46)	(3.40)	(3.10)
a_7	.052	.061	.063
	(4.58)	(7.10)	(5.80)
a_8	−.024	−.017	−.016
	(−2.23)	(−2.14)	(−1.98)
SE	.0190	.0138	.0133
R^2	.960	.981	.990
DW	2.35	1.90	1.21
No. obs.	20	19	12
$\hat{V}_{1992}$	.501	.467	.463

Estimation technique is OLS.
t-statistics are in parentheses.

fifteen-quarter period decreases the vote share by .83 percentage points. Each quarter in which the growth rate is greater than 2.9 percent adds .99 percentage points to the vote share. The coefficient estimates of *DPER* and *DUR* are of the expected signs, positive and negative respectively. The estimated standard error of the equation is less than 2 percentage points at .0190, and the (within-sample) prediction for 1992 actually has Clinton winning with 50.1 percent of the two-party vote!

The second sample period in Table 1 drops the 1992 observation, and this has a noticeable effect on some of the coefficient estimates. The coefficient estimate for n falls from .0099 to .0064, although it is still significant, and the coefficient estimate for *DPER* rises from .052 to .061. These changes are as expected. When the 1992 observation is added, an increase in the coefficient of n helps explain the low share for Bush (remember, n is low for the 1992 election), as does a fall in the coefficient of the person variable, *DPER* (since Bush was an incumbent running again). The (outside-sample) prediction for 1992 is .467, which given the actual value of .535, is a prediction error of .068. The estimated standard error of the equation is only .0138, which then rises to .0190 when the 1992 observation is added.

The third sample period in Table 1 ends in 1960. The main result here is that the coefficient estimates for this sample period are very similar to the coefficient estimates for the 1916–1988 period except perhaps for a_5. The equation is quite stable in this respect.

Prediction Errors

The prediction errors for the equations estimated for the first and third sample periods are presented in Table 2. The errors for the 1916–1992 equation are all within-sample, but the errors for the 1916–1960 equation are outside-sample from 1964 on. As expected, given the small estimated standard errors, the prediction errors are generally small in Table 2. The largest error for each equation occurs in 1992, where the Democratic vote share is underpredicted.

TABLE 2. Prediction Errors

		1916–1992 eq.		1916–1960 eq.	
t	V	$\hat{V}$	$V-\hat{V}$	$\hat{V}$	$V-\hat{V}$
1916	.517	.495	.022	.507	.010
1920	.361	.382	−.021	.363	−.002
1924	.418	.419	−.001	.424	−.006
1928	.412	.427	−.015	.426	−.014
1932	.592	.607	−.015	.591	.001
1936	.625	.629	−.004	.633	−.008
1940	.550	.553	−.003	.551	−.001
1944	.538	.522	.016	.531	.007
1948	.524	.518	.006	.528	−.004
1952	.446	.449	−.003	.446	−.000
1956	.422	.417	.005	.413	.009
1960	.501	.494	.007	.489	.012
1964	.613	.617	−.004	.603	.010
1968	.496	.504	−.008	.495	.001
1972	.382	.392	−.010	.376	.006
1976	.511	.507	.004	.491	.020
1980	.447	.446	.001	.453	−.006
1984	.408	.387	.021	.373	.035
1988	.461	.489	−.028	.480	−.019
1992	.535	.501	.034	.463	.072

Perhaps the most remarkable feature of the errors in Table 2 is the string of very small errors between 1964 and 1988 for the second equation. These are all outside-sample errors, and, for example, the error for the 1988 election is outside sample by 28 years. The mean absolute error for these seven errors is only .014. If the 1992 error of .072 is added, the mean absolute error rises to .021.

An equation like the present voting equation should be judged according to the size of its errors and not according to how many winners it correctly predicted. From a least squares point of view, a close election predicted incorrectly as to winner but with a small error is better than a landslide predicted correctly as to winner but with a large error. Nevertheless, most people can't resist pointing out the elections in which the winner was not predicted correctly. For the 1916–1992 equation, the elections that were predicted incorrectly as to the winner are the elections of 1916 (error of .022), 1960 (error of .007), and 1968 (error of $-.008$). For the 1916–1960 equation, the elections are 1960 (error of .012), 1976 (error of .020), and 1992 (error of .072). The errors for these elections are all small except the error for the 1992 election.

Adding Other Variables

It has already been mentioned that $g3$ dominated $g2$—when both were included in the equation $g3$ was significant and $g2$ was not. Similarly, $g3$ dominated $g4$, and $p15$ dominated $p8$. The following is a brief discussion of other variables that were tried.

If voters look back the full fifteen quarters, an alternative to n is the growth rate over the full fifteen quarters, $g15$. When $g15 \cdot I \cdot (1 - DWAR)$ was added to the equation, it had a coefficient estimate of the wrong (negative) sign and a t-statistic of -1.63. The coefficient estimate of n was still significant and of the expected sign. n thus dominates $g15$.

Another possibility is that the average unemployment rate over the first fifteen quarters of an administration, $u15$, affects voters. When $u15 \cdot I \cdot (1 - DWAR)$ was added, it had a t-statistic of only -0.24. Average unemployment rates for various subperiods also were not significant. This result is consistent with the original work in Fair (1978), where unemployment-rate levels were not significant.

Haynes and Stone (1994) used an armed forces variable in one of their specifications. The variable was the percentage change in the proportion of the population in the armed forces in the two-year period before the election, which is denoted $a8$ in the appendix. When $a8 \cdot I$ was added to the equation, it had a t-statistic of only 1.20, and so there is little evidence for this variable here.[14]

Finally, the variables denoted $gg15(\lambda)$ in the appendix were added (after being multiplied by I) one by one for values of λ of .1, .2, . . ., 1.0. These are variables that Hibbs (1987), p. 197, used in the estimation of a voting equation, where he found that $\lambda = .8$ worked best. The larger is λ, the larger are the weights that voters are assumed to place on past values of the growth rate. In the present case all the variables had the wrong sign, and none of them were significant. These variables were clearly dominated by g3 and n.

Effects of the 1992 Election

The 1988 equation, described at the beginning of this section, had an outside-sample prediction error of .098 for 1992, and when it was estimated using the new data for the same 1916–1988 period, the outside-sample prediction error was even larger at .120. The equation in Table 1 estimated using the new data for the 1916–1988 period yields an outside-sample prediction error of .068 (.535 − .467), and the equation in Table 1 estimated for the 1916–1992 period yields a within-sample prediction error of .034. The changes to the equation made in this article have thus lowered the 1992 error, but it is still the largest error in the 20 elections.

As discussed above, some of the coefficient estimates change noticeably when the 1992 observation is added. Note from Table 1, however, that the coefficient estimate for n is significant even when the equation is only estimated through 1960, so that the importance of n does not hinge on the 1992 observation. This is true for the other variables as well. The estimates are affected by the 1992 observation, but the basic story holds even when the 1992 observation is omitted.

The Equation as a Prediction Device and the Use of Survey Data

Although the equation presented in this article can be used to make predictions conditional on the economy, it differs in an important way from equations that use variables from surveys to help predict election outcomes. The aim here is to model the way that voters form expectations of their future utilities under different political regimes, U_{it}^D and U_{it}^R in equations 2 and 3. The results suggest that g3, $p15$, and n affect U_{it}^D if the Democrats are in power and U_{it}^R if the Republicans are in power.[15] For present purposes it would not be appropriate to include in M in equations 2 and 3 variables constructed from consumer sentiment surveys, voter attitude surveys, and voter preference surveys. These variables are either expectations themselves, such as a variable based on an answer to a question about what you think the economy or your own personal situation will be like in six months, or the result of expectations, such as a variable based on an answer to a question about which candidate you currently prefer or think you will vote for. The present approach models expectations based on fundamental historical information, and it would be inappropriate to use survey responses, which are themselves expressions of expectations.[16]

This argument about survey variables also pertains at least somewhat to stock-price variables. Gleisner (1992) adds a stock-price variable, the rate of change in the Dow-Jones average from January to October of the election year, to the 1988 equation and finds that the variable is significant. Haynes and Stone (1994) use this same variable in their two alternatives to the equation. A potential problem with this procedure from an explanatory point of view is that stock prices primarily *reflect* future expectations rather than help form such expectations. In this sense they are like answers to survey questions about one's view of the future. Again, there is nothing wrong with using stock-price variables to try to help predict voting outcomes, but they may not be appropriate M variables within the context of the general model in Section 2. Thus, Gleisner (1992) and Haynes and Stone (1994) may not have "improved" the equation, as they suggest, but rather are estimating a different kind of equation, a prediction equation. If this is so, then their results should be compared to the results of the studies mentioned in footnote 16.

4. CONDITIONAL PREDICTIONS OF THE 1996 ELECTION

The equation developed in this article can be used to make predictions conditional on the economy. If Clinton runs for reelection in 1996, all the incumbency variables are known, and the equation (with the coefficients from the 1916–1992 estimation period) becomes:

$$V = .4859 + .0065g3 - .0083p15 + .0099n \tag{15}$$

Given assumptions about $g3$, $p15$, and n, equation 15 can be used to make predictions of V. Remember that $g3$ and n pertain to growth rates of *per capita* real GDP. Since the U.S. population is currently growing at an annual rate of about 1 percent, the growth rates to use for the present calculations are 1 less than the non–per capita rates normally quoted in the press.

At the time of this writing (October 4, 1994) six quarters worth of data (1993:1–1994:2) are available for the Clinton administration. The growth rate over this period has been 1.6 percent at an annual rate, and there have been two quarters in which the growth rate exceeded 2.9 percent—1993:4 at 4.14 percent and 1994:2 at 2.91 percent. The inflation rate has been 2.8 percent at an annual rate. The current consensus view about the future course of the economy is that the (per capita) growth rate will be about 1.5 percent through 1996 and that the inflation rate will be around 3 percent. If, say, $g3$ turns out to be 1.5, $p15$ turns out to be 3, and there are no more quarters of a growth rate greater than 2.9, so that n turns out to be 2, then the predicted value of V is .49055, which would be a Clinton loss in a close race. If one of the remaining nine quarters before the election has a growth rate greater than 2.9, so that n is 3, then the predicted value of V is .50045, which is essentially a dead heat. In general, unless the current consensus view about the economy is quite far off, the basic story from the equation is that the 1996 election will be close with a slight edge for the Republicans.

5. CONCLUSION

The main new result from this update is that when voters form expectations, they appear to look back further than the earlier results suggested they did. Although the growth rate in the year of the election is still an important variable, so are the inflation rate over the whole fifteen-quarter period and the number of quarters of high growth over the whole period.

It is clear that data mining may be a serious problem in a study like the present one, and the following are a few of the caveats that should be kept in mind about the equation:

1. There are only 20 observations, and much searching was done in arriving at the "final" equation. This included searching for the best threshold value for n and the best increment for *DUR* as well as for the best variables.
2. The outside-sample prediction errors for 1992 are large, and adding the 1992 observation to the estimation period results in fairly large changes in some coefficient estimates.
3. The coefficient estimates are sensitive to the use of the new versus old data, and in this sense the equation is not robust.
4. The equation predicts worse prior to 1916 than after, and because of this, the sample period was picked to begin in 1916.
5. The coefficients of $p15$ and n were taken to be 0 for the 1920, 1944, and 1948 elections because of the world wars. This helped the fit.
6. Ford was not counted as an incumbent running again because he was appointed vice president rather than running on the original ticket. This also helped the fit.

Given these caveats, especially the first, it is hard to know what to make of the equation. If one just looks at the final equation estimated for the 1916–

1992 period, it does a remarkable job in explaining votes for president. The estimated standard error is less than 2 percentage points, and the largest within-sample error is only 3.4 percentage points. The equation also does well in predicting the elections from 1964 on, with the exception of the 1992 election, when estimated only through 1960. In this sense the equation is very stable. The equation is sensible theoretically in that it falls within the general model discussed in Section 1.

On the other hand, if one just looks at the caveats, one might say that Fair is at it again and has found an equation that explains the past well but is not likely to explain the future well. One might say that the equation is likely to be seriously misspecified, in part because it is likely to be overparameterized, and such an equation is not likely to do well in explaining the future.

Time will tell which view is right. If, conditional on the economy, the equation predicts the next two or three elections within 2 or 3 percentage points, there may be something to it. Otherwise, I will have to keep searching or retire.

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DATA Appendix

Voting Data

1876–1916: pp. 1078–1079 in Balke and Gordon, 1986; 1920–1932: p. 232 in U.S. Department of Commerce, 1975; 1936–1992: p. 263 in U.S. Department of Commerce, 1988. V is the Democratic vote divided by the Democratic plus Republican vote except for the 1912 and 1924 elections. For 1912, V is the Democratic vote divided by the Democratic plus Republican plus Roosevelt vote. For 1924, V is the Democratic vote plus .765 times the LaFollette vote divided by the Democratic plus Republican plus LaFollette vote.

Incumbency Variables

I = 1 if there is a Democratic incumbent and −1 if there is a Republican incumbent.

$DPER$ = 1 if there is a Democratic incumbent running for election, −1 if there is a Republican incumbent running for election, and 0 otherwise. Ford is not counted as an incumbent running again, whereas the other vice presidents who became president while in office are counted.

DUR = 0 if the incumbent party has been in power for only one or two consecutive terms, 1 for Democrats and −1 for Republicans if the incumbent party has been in power for three consecutive terms, 1.25 for Democrats and −1.25 for Republicans if the incumbent party has been in power for four consecutive terms, 1.50 and −1.50 for five consecutive terms, and so on.

DWAR = 1 for the elections of 1920, 1944, 1948, and 0 otherwise.

TABLE A. Selected Data

t	*V*	*I*	*DPER*	*DUR*	*g*3	*p*15	*n*	*g*15	*u*15	*a*8
1880	0.4978	−1	0	−1.75	3.879	1.974	9	7.636	NA	NA
1884	0.5015	−1	0	−2.00	1.589	1.055	4	−0.444	NA	NA
1888	0.5041	1	1	0.00	−5.553	0.604	3	−0.449	NA	NA
1892	0.5173	−1	−1	0.00	2.763	2.274	8	3.992	NA	−2.004
1896	0.4776	1	0	0.00	−10.024	3.410	6	−2.013	14.560	−1.854
1900	0.4683	−1	−1	0.00	−1.425	2.548	8	4.826	9.907	−28.760
1904	0.3999	−1	0	−1.00	−2.421	1.442	5	1.887	4.173	−2.296
1908	0.4552	−1	0	−1.25	−6.281	1.879	8	0.612	3.947	4.244
1912	0.4529	−1	−1	−1.50	4.164	2.172	10	3.404	5.640	1.238
1916	0.5168	1	1	0.00	2.229	4.252	3	−1.243	6.540	3.921
1920	0.3612	1	0	1.00	−11.463	16.535	5	−0.575	3.013	−64.432
1924	0.4176	−1	−1	0.00	−3.872	5.161	10	4.198	6.547	−3.445
1928	0.4118	−1	0	−1.00	4.623	0.183	7	2.226	3.053	−0.135
1932	0.5916	−1	−1	−1.25	−15.574	6.657	3	−8.897	12.133	−2.609
1936	0.6246	1	1	0.00	12.625	3.387	9	8.196	21.167	6.706
1940	0.5500	1	1	1.00	2.420	0.553	8	2.220	16.387	24.992
1944	0.5377	1	1	1.25	2.910	6.432	13	11.492	4.640	67.350
1948	0.5237	1	1	1.50	3.105	10.369	3	−5.822	3.331	−36.201
1952	0.4460	1	0	1.75	0.910	2.256	7	3.361	4.496	45.510
1956	0.4224	−1	−1	0.00	−1.479	2.132	6	0.598	4.253	−9.342
1960	0.5009	−1	0	−1.00	0.020	2.299	5	0.415	5.477	−4.313
1964	0.6134	1	1	0.00	4.950	1.201	11	4.004	5.800	−2.659
1968	0.4960	1	0	1.00	4.712	3.160	9	4.174	3.944	5.131
1972	0.3821	−1	−1	0.00	5.716	4.762	6	1.905	5.001	−13.530
1976	0.5105	−1	0	−1.00	3.411	7.604	6	1.011	6.685	−2.652
1980	0.4470	1	1	0.00	−3.512	7.947	5	1.706	6.679	−1.339
1984	0.4083	−1	−1	0.00	5.722	5.296	7	1.901	9.003	0.127
1988	0.4610	−1	0	−1.00	2.174	3.392	5	2.345	6.955	−1.888
1992	0.5345	−1	−1	−1.25	1.478	3.834	0	0.008	6.662	−5.683

Raw-Data Economic Variables

Nominal GDP

1875:1–1945:4: pp. 789–795 in Balke and Gordon, 1986, where each of the four quarters of each of the years 1929–1945 was multiplied by the ratio of the respective yearly value in Table 1.1 in U.S. Department of Commerce, 1992, to the respective yearly value on pp. 782–783 in Balke and Gordon, 1986; 1946:1–1992:4: Table 1.1 in U.S. Department of Commerce, 1992, Table 1.1 in U.S. Department of Commerce, 1981, and updates.

Real GDP

1875:1–1946:4: pp. 789–795 in Balke and Gordon, 1986, where each observation is multiplied by 2.47587; 1947:1–1959:2: Table 1.2 in U.S. Department of Commerce, 1973, where each observation is multiplied by 2.47587; 1959:3–1992:4: the ratio of nominal GDP above to the values (divided by 100) in Table 7.1, line 6, in U.S. Department of Commerce, 1981, and updates. The 2.47587 number is for splicing. It is the ratio of two numbers. The first is nominal GDP in Table 1.1 in U.S. Department of Commerce, 1981, for 1959:3 divided by the chain-link price index in Table 7.1, line 6, in U.S. Department of Commerce, 1981, for 1959:3. The second is real GNP in Table 1.2 in U.S. Department of Commerce, 1973, for 1959:3.

Population

1873–1928: pp. 200–201, A114 series, in U.S. Department of Commerce, Bureau of the Census, 1993, where each observation was multiplied by 1.000887; 1929–1945: Table 8.2 in U.S. Department of Commerce, 1992; 1946:1–1992:4: Table 8.2 in U.S. Department of Commerce, 1992, Table 8.2 in U.S. Department of Commerce, 1981, and updates. Quarterly observations prior to 1946 were obtained by interpolating the annual observations using the method presented in Fair (1994), Table B.6. The 1.000887 number is for splicing. It is the ratio of the A114 series in U.S. Department of Commerce, Bureau of the Census, 1993, for 1929 to the value in Table 8.2 in U.S. Department of Commerce, 1992, for 1929.

Unemployment Rate

1890–1928: pp. 212–213, B1 series (Lebergott) in U.S. Department of Commerce, Bureau of the Census, 1993; 1928–1947: p. 213, B2 series (BLS) in U.S. Department of Commerce, Bureau of the Census, 1993; January 1948–December 1951: *LHUR* variable in Citibase; 1952:1–1992:4: *UR* variable in Fair (1994) multiplied by 100. Quarterly averages of the monthly data were taken for the Citibase data. Only annual data were used prior to 1948—each quarterly observation for a year was taken to be the yearly observation.

The Level of the Armed Forces

1890–1951: Tables A-3 and A-15 in Ladd, 1993; 1952:1–1994:2: *JM* variable in Fair (1994). Only annual data were used prior to 1952—each quarterly observation for a year was taken to be the yearly observation.

Economic Variables Used or Tried in the Paper

Let Y be Real GDP divided by Population, P be Nominal GDP divided by Real GDP, U be the Unemployment Rate, and A be the Level of the Armed Forces divided by Population. Let subscript k denote the kth quarter within the sixteen-quarter period of an administration and let (-1) denote the variable lagged one sixteen-quarter period. Finally, let q_k be the growth rate of Y in quarter k (at an annual rate), which is $((Y_k/Y_{k-1})^4 - 1) \cdot 100$ for quarters 2 through 16 and $((Y_1/Y_{16}(-1))^4 - 1) \cdot 100$ for quarter 1. The economic variables used in the article are:

$g2$	$((Y_{15}/Y_{13})^{(4/2)}-1)\cdot 100$
$g3$	$((Y_{15}/Y_{12})^{(4/3)}-1)\cdot 100$
$g4$	$((Y_{15}/Y_{11})^{(4/4)}-1)\cdot 100$
$g15$	$((Y_{15}/Y_{16}(-1))^{(4/15)}-1)\cdot 100$
$p8$	$\lvert((P_{15}/P_7)^{(4/8)}-1)\cdot 100\rvert$
$p15$	$\lvert((P_{15}/P_{16}(-1))^{(4/15)}-1)\cdot 100\rvert$
n	Number of quarters in the first fifteen quarters of an administration in which q_k is greater than 2.9
$u15$	$(U_{15}+U_{14}+\ldots+U_1)/15$
$a8$	$((A_{15}/A_7)^{(4/8)}-1)\cdot 100$
$gg15(\lambda)$	$(\Sigma_{i=0}^{14}\lambda^i q_{15-i})/(\Sigma_{i=0}^{14}\lambda^i)$

NOTES

1. The review in this section is brief, and the reader is referred to Fair (1978) for justification of the assumptions and for more detail.
2. Actually, not quite 4 years, since elections are held in early November. In the empirical work in this article, data for the fourth quarter of the fourth year were not used in the measures of performance.
3. In Fair (1978) the norms were not made explicit, and the specification just began with equation 11. The norms are simply a justification for having a constant term in equation 11.
4. If ρ is infinite, the M_{td2} and M_{tr2} terms in equation 9 are zero, as is the $M_{t\cdot 1}$ term for the nonincumbent party.
5. Some of the early data are data on GNP, gross national product, rather than GDP, gross domestic product. The differences between GDP and GNP are trivial for the early years, and for ease of reference GDP will always be used in referring to the national output data.
6. The Balke and Gordon data were also used in Lynch (1993) and Lynch and Munger (1994) in the estimation of voting equations.
7. See Young (1992) and Triplett (1992) for a good discussion of these problems and of the chain-link price indices.
8. In earlier work a third-party adjustment was also made for the election of 1912, where the votes for Taft and Roosevelt were added together and counted as Republican. This adjustment is not relevant for the present article since all estimation periods begin in 1916.
9. Whenever "growth rate" is used in this article, it always refers to the growth rate of real, per capita GDP at an annual rate. Likewise, "inflation rate" always refers to the absolute value of the growth rate of the GDP deflator at an annual rate.
10. The time trend used for this equation was incremented by 1 through 1976 and by 0 after that. This was done because the results seemed to suggest a trend in favor of the Democrats until about 1976 and then no trend after that. Also, in the construction of *DPER*, Ford was not counted as an incumbent running again, whereas the other vice presidents who became president while in office were counted.
11. An attempt was also made in Fair (1978) to account for the independent vote-getting ability of someone who ran more than once. This was done by postulating certain restrictions on the covariance matrix of the error term when a person had run before. This effort met with only limited success, and no attempt was made in the current study to account for any restrictions on the covariance matrix.
12. Within the context of the general model in Section 1, there is another way of testing how far back voters look in forming future expectations. This is to estimate the discount rate ρ in equations 2 and 3. As noted above, this was done in Fair (1978) and the estimates of ρ were

quite large. In future work, when a few more observations become available, it may be of interest to examine this question again. The results in this article, however, are based on the assumption that ρ is infinite, which means that voters are assumed not to look back more than 4 years.

13. Table A presents data back to the 1880 election, and some estimation was done with elections prior to 1916 added to the sample period. As was the case for the work reported in Fair (1978), the results using the elections before 1916 were not as good. The addition of the earlier observations led to larger estimated standard errors, and the decision was made to continue with the sample period beginning in 1916. To save space, the results using the pre-1916 data will not be reported here.
14. Haynes and Stone (1994) also interacted the armed forces variable with two economic variables. No interaction terms were tried in the present study because there seemed to be too few degrees of freedom left to do so. Various armed forces variables were also tried in Fair (1978), but none were significant.
15. If ρ is infinite, which is assumed here, U_{it}^{D} is simply a constant—ξ_i^D—if the Republicans are in power and U_{it}^{R} is simply a constant—ξ_i^R—if the Democrats are in power.
16. There is, of course, nothing wrong with trying to find equations that use survey variables to predict election outcomes. It is just that this work is not the same as trying to estimate equations 2 and 3. This work is not trying to find the *determinants* of expectations, and in this sense it is less explanatory than the approach taken in this article. Recent studies that use survey variables in predicting votes for president include Abramowitz (1988), Erikson (1989), Campbell and Wink (1990), and Lewis-Beck and Rice (1992).

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