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THE EFFECT OF ECONOMIC EVENTS ON VOTES FOR PRESIDENT

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THE EFFECT OF ECONOMIC EVENTS ON VOTES FOR PRESIDENT*

by

Ray C. Fair**

I. Introduction

An important question in political economy is whether economic events affect voting behavior. Kramer [2] concluded from his analysis of U.S. voting behavior that economic fluctuations have an important influence on congressional elections. In particular, his results indicate that the growth rate of real per capita income and the inflation rate in the year of the election are important in explaining the congressional vote, with a high growth rate and a low inflation rate helping the congressional candidates of the party that is in control of the presidency at the time of the election and a low growth rate and a high inflation rate helping the congressional candidates of the other party.[1] Kramer also

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**This paper is an expanded version of Section II of my paper, "On Controlling the Economy to Win Elections," Cowles Foundation Discussion Paper No. 397, August 14, 1975. I am indebted to Orley Ashenfelter and Gerald Kramer for helpful discussions regarding the subject matter of this paper.

[1]The results in Kramer's original paper [2] show that the growth rate of real per capita income in the year of the election is the only important economic variable explaining the congressional vote. There were, however, some data errors in Kramer's income series, and the corrected results, which are presented in the paper's Bobbs-Merrill reprint (PS-498), show that the inflation rate is also important in explaining the congressional vote. Tufte [5] in an analysis of midterm congressional elections found the change in real per capita income in the year of the election to have an important influence on the congressional vote. He did not do any experiments to see if the inflation rate was also important.

concluded, however, that the presidential vote is substantially less responsive to economic conditions than is the congressional vote.

Although Kramer's congressional results have been challenged, in particularly by Stigler [4], no systematic test of Kramer's model against other possible models has been made. The purpose of this paper is to present and estimate a model of voting behavior that is more general than Kramer's model. The model includes Kramer's model as a special case, and so it is possible to test the validity of this special case against a more general formulation. Two important issues that are considered in this examination are the degree to which voters remember the past economic performances of the political parties and the measure of economic performance that the voters use. It will be seen that Kramer's model implies that voters are myopic in two senses: they look only at the economic performance of the party that is in power at the time of the election, and they measure the economic performance of this party solely by the events that take place in the year of the election.

The voting data that are used in this study pertain only to presidential elections; the 20 presidential elections between 1896 and 1972 are analyzed. Since Kramer found that economic events have an important effect on the congressional vote, it is at first glance puzzling that he did not also find this to be true for the presidential vote. Kramer assumed, as is also done in this paper, that voters hold the party that controls the presidency accountable for economic events, rather than, say, the party that controls the Congress (if it is different) or the Board of Governors of the Federal Reserve System. If this assumption is true, one would expect economic events, if they have any influence on elections at all, to influence both congressional and presidential elections. Kramer argues that presidential elections may be more influenced by personality factors and other non economic events than are congressional elections, but this is far from obvious. The results in this paper do in fact indicate, contrary to Kramer's results, that economic events have an important effect on the presidential vote. Kramer constrained the coefficient estimates in the equation explaining the presidential vote to be the same as the coefficient estimates in the equation explaining the congressional vote, and this appears to be the main reason for his negative results regarding the presidential vote. When this constraint is relaxed, as in this paper, economic events do appear to have an important effect on the presidential vote. It will be argued in the next section that there is no strong theoretical justification for imposing the constraint that the coefficient estimates be the same in the two equations. An analysis of the congressional vote within the context of the present model is left for another study.

The two main conclusions of this paper are first, as just mentioned, that economic events have an important effect on the presidential vote and second that voters do appear to be myopic in both of the senses mentioned above. The data for the past 20 elections rather clearly indicate that the growth rate of real per capita income in the year of the election is the most important economic factor explaining the presidential vote. Try as I might, I could not find, within the context of the present model, any other variables that were more important. The results obtained here thus validate for the past 20 presidential elections the special case of Kramer's model against the more general model of voting behavior proposed in the next section.

Three other important conclusions of this paper are (1) that the U.S. involvement in wars does not appear to have any significant effect on the presidential vote, (2) that an incumbent president running himself for election has an initial advantage of about 3 percentage points, and (3) there appears to be a bias in the system in favor of Republican presidential candidates.

II. The Model of Voting Behavior

The model presented here is based on two main postulates. The first is that a voter's expectation of her or his future economic welfare under a presidential candidate influences her or his vote for the candidate, and the second is that the voter forms this expectation on the basis of the past economic performance of the candidate's party. The other important assumptions that are made below concern the question of aggregation. In the process of deriving an aggregate equation that can be estimated, a number of assumptions are made about what is voter specific but not election specific and what is election specific but not voter specific. In many studies of this type the aggregation question is ignored by merely starting with an aggregate specification in the first place, but it seemed useful in the present case to lay our explicitly a sufficient set of assumptions for estimating an aggregate equation.

Consider a presidential election held at time t. (In what follows, t should be considered as being equal to 1 on election day in 1892, to 2 on election day in 1896, and so on. An election held at time t will sometimes be referred to as election t.) Let

E_{it}^{D} = voter i's expected future economic welfare if the Democratic presidential candidate is elected at time t,

E_{it}^{R} = voter i's expected future economic welfare if the Republican presidential candidate is elected at time t .

These expectations should be considered as being made at time t . Let V_{it} be a variable that is equal to one if voter i votes for the Democratic candidate at time t and to zero if voter i votes for the Republican candidate at time t . The first main postulate of the model is that:

$$V_{it} = \begin{cases} 1 & \text{if } E_{it}^{D} - E_{it}^{R} \geq \gamma_i + \mu_t \\ 0 & \text{otherwise .} \end{cases} \tag{1}$$

Equation (1) states that voter i votes for the Democratic candidate if the difference between her or his expected future economic welfare under the Democratic and Republican candidates is greater than or equal to some number $\gamma_i + \mu_t$; otherwise the voter votes for the Republican candidate. The numbers γ_i and μ_t can be either positive or negative. γ_i is specific to voter i , and μ_t is specific to election t . In other words, γ_i is the same for voter i across all of the elections that he or she votes in, and μ_t is the same for election t across all of the voters who vote in the election.

The second main postulate of the model concerns the determinants of E_{it}^{D} and E_{it}^{R} . Let

td1 = last election from t back that the Democratic party was in power,

td2 = second-to-last election from t back that the Democratic party was in power,

tr1 = last election from t back that the Republican party was in power,

tr2 = second-to-last election from t back that the Republican party was in power,

M_j = some measure of economic performance of the party in power during the four years prior to election j .

If the Democratic party were in power at time t, then $td1$ is equal to t; otherwise $tr1$ is equal to t. The second postulate is that

$$(2) \qquad E_{it}^{D} = \xi_i^{D} + v_t^{D} + \beta_1 \frac{M_{td1}}{(1+\rho)^{t-td1}} + \beta_2 \frac{M_{td2}}{(1+\rho)^{t-td2}}, \quad \beta_1 > 0, \quad \beta_2 > 0,$$

$$(3) \qquad E_{it}^{R} = \xi_t^{R} + v_t^{R} + \beta_3 \frac{M_{tr1}}{(1+\rho)^{t-tr1}} + \beta_4 \frac{M_{tr2}}{(1+\rho)^{t-tr2}}, \quad \beta_3 > 0, \quad \beta_4 > 0,$$

where β_1, β_2, β_3, and β_4 are unknown coefficients and ρ is an unknown discount rate. Equation (2) states that E_{it}^{D} is a function of how well the Democratic party performed economically during the prior two times that it was in power. The performance measure is discounted from time t back to rate ρ. Equation (3) is a similar equation for E_{it}^{R}. ξ_i^{D} and ξ_i^{R} are specific to voter i, and v_t^{D} and v_t^{R} are specific to election t. It should be noted that the β coefficients and ρ have neither i nor t subscripts and so are assumed to be constant across both voters and elections. Similarly, the measure terms have no i subscripts and so are assumed to be the same across voters.

It will be convenient to let

$$(4) \qquad \psi_i = \gamma_i - \xi_i^{D} + \xi_i^{R},$$

$$(5) \qquad \eta_t = -\mu_t + v_t^{D} - v_t^{R},$$

$$(6) \qquad q_t = \beta_1 \frac{M_{td1}}{(1+\rho)^{t-td1}} + \beta_2 \frac{M_{td2}}{(1+\rho)^{t-td2}} - \beta_3 \frac{M_{tr1}}{(1+\rho)^{t-tr1}} - \beta_4 \frac{M_{tr2}}{(1+\rho)^{t-tr2}}.$$

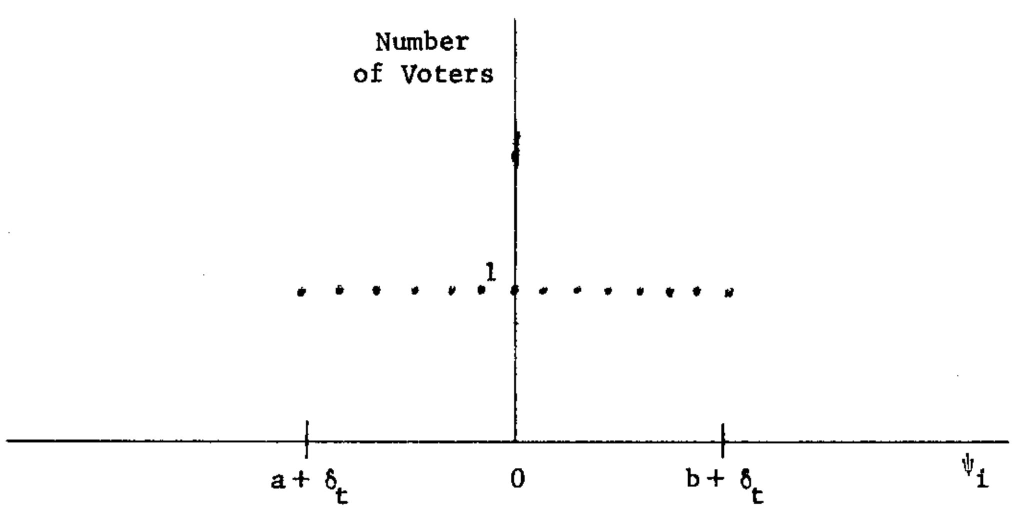
Using these definitions and equations (2) and (3), equation (1) can then be written:

$$(1)' \qquad V_{it} = \begin{cases} 1 & \text{if } q_t + \eta_t \geq \psi_i \\ 0 & \text{otherwise.} \end{cases}$$

The following two assumptions about the aggregation question will now be made. The first is that ψ_i in (4) is evenly distributed across voters in each election between some numbers $a+\delta_t$ and $b+\delta_t$, as depicted in Figure 1, where $a < 0$ and $b > 0$. δ_t is specific to election t, but a and b are constant across all elections. Since the same set of voters does not vote in each election, this assumption is somewhat stronger than the assumption that ψ_i is merely evenly distributed between $a+\delta_t$ and $b+\delta_t$ across the same set of voters in each election. If, for example, there are more voters in one election than in another, then the points between $a+\delta_t$ and $b+\delta_t$ are more tightly packed, but a and b do not change. The second assumption is much less important

FIGURE 1

Assumption about the Distribution of ψ_i



The number of points between $a+\delta_t$ and $b+\delta_t$ is equal to the number of voters who vote in the election. The points are evenly distributed between $a+\delta_t$ and $b+\delta_t$.

than the first. It is that there are an infinite number of voters in each election. The number of voters in any one election is large enough that little is lost by making this assumption. Using these two assumptions, ψ can then be taken to be 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, denoted as $f_t(\psi)$, is:

$$(7) \qquad f_t(\psi) = \begin{cases} \frac{1}{b-a} & \text{for } a+\delta_t < \psi < b+\delta_t \\ 0 & \text{otherwise,} \end{cases}$$

and the cumulative distribution function for ψ, denoted as $F_t(\psi)$, is:

$$(8) \qquad F_t(\psi) = \begin{cases} 0 & \text{for } \psi < a+\delta_t \\ \frac{\psi - a - \delta_t}{b - a} & \text{for } a+\delta_t \leq \psi \leq b+\delta_t \\ 1 & \text{for } \psi > b+\delta_t \,. \end{cases}$$

The density and distribution functions are different for each election because of δ_t.

Let V_t denote the percentage of the two-party vote that goes to the Democratic candidate in election t. From the above assumptions, V_t is equal to the probability that ψ is less than or equal to $q_t + \eta_t$. If, for example, $q_t + \eta_t$ is halfway between $a+\delta_t$ and $b+\delta_t$, then half of the voters will vote for the Democratic candidate. The probability that ψ is less than or equal to $q_t + \eta_t$ is merely $F_t(q_t + \eta_t)$, so that from (8):

$$(9) \qquad V_t = -\frac{a}{b-a} + \frac{q_t}{b-a} + \frac{\eta_t - \delta_t}{b-a} \,.$$

It will be convenient to rewrite equation (9) as

$$(9)' \qquad V_t = \alpha_0 + \alpha_1 q_t + \epsilon_t \ ,$$

where $\alpha_0 = -a/(b-a)$, $\alpha_1 = 1/(b-a)$, and $\epsilon_t = (\eta_t - \delta_t)/(b-a)$. Finally, combining equations (6) and (9)' yields:

$$(10) \qquad V_t = \alpha_0 + \alpha_1\beta_1\frac{M_{td1}}{(1+\rho)^{t-td1}} + \alpha_1\beta_2\frac{M_{td2}}{(1+\rho)^{t-td2}} - \alpha_1\beta_3\frac{M_{tr1}}{(1+\rho)^{t-tr1}} - \alpha_1\beta_4\frac{M_{tr2}}{(1+\rho)^{t-tr2}} + \epsilon_t \ .$$

Given a measure of economic performance and a value of the discount rate ρ and treating ϵ_t as an error term, equation (10) is a linear equation in four variables and a constant. A linear regression of this equation will yield estimates of α_0 , $\alpha_1\beta_1$, $\alpha_1\beta_2$, $\alpha_1\beta_3$, and $\alpha_1\beta_4$. It is not possible to estimate α_1 and the β coefficients separately, but this is of no real concern here.

The election-specific term ϵ_t in equation (10) is a function of μ_t in (1), v_t^D in (2), v_t^R in (3), and δ_t in (8). It is meant to pick up the effects on voting behavior that are not captured in the measure terms in equation (10), effects such as the personalities of the candidates. A necessary condition for the coefficient estimates of equation (10) to be consistent is that ϵ_t be uncorrelated with the measure terms in the equation, and this does not seem to be a particularly unreasonable assumption to make in the present context.

The voter-specific term ψ_i is a function of γ_i in (1), δ_i^D in (2), and δ_i^R in (3). If in the above analysis ψ was assumed to be, say, normally distributed rather than uniformly distributed, then V_t in equation (9) would no longer be a linear function of q_t . The normal cumulative distribution function is not linear in ψ . V_t does, however, only vary between about 0.35 and 0.65, and so it may be that even if ψ were normally distributed, V_t would be approximately linear in q_t over most of its relevant range. The assumption that ψ is uniformly distributed may thus not be as restrictive as one might otherwise expect.

A special case of equation (10), which will be referred to here as Kramer's model,[2] is where $\beta_1 = \beta_3$, $\beta_2 = \beta_4 = 0$, $\rho = \infty$,[3] and M_j equals the growth rate of real income in the year of election t (denoted, say, as g_t). In this case, equation (10) can be written:

$$V_t = \alpha_0 + \alpha_1\beta_1 I_t g_t + \epsilon_t \ , \tag{10'}$$

where I_t equals 1 if the Democrats were in power at time t $(tdl = t)$ and -1 if the Republicans were in power at time t $(trl = t)$. This special case is myopic in two senses. First, a value of ρ of ∞ means that voters look only at the immediate past four-year performance of the party in power in forming expectations of their future economic welfare. Second, the use of g_t as the measure of performance means that voters measure performance only by the events that take place in the fourth year of the four-year period prior to the election. It seems safe to say that

[2]Equation (10)' is not the exact equation that Kramer estimated in his empirical work. He included a dummy incumbency variable in all of his regressions; he included a linear time trend in some of his regressions; he attempted to estimate a "coattails" effect on the congressional vote; he included more than one economic variable at a time in some of his regressions (such as both g_t and the inflation rate in the year of the election); and, as mentioned in the Introduction, he constrained the coefficient estimates in the congressional and presidential equations to be the same. Equation (10)' does, however, capture the essence of Kramer's model, and so for simplicity it will be referred to as Kramer's model in the following discussion.

[3]For present purposes, $(1+\infty)^0$ is defined to be 1. When $\rho = \infty$, the second and fourth variables in equation (10) drop out, so that the restriction that $\beta_2 = \beta_4 = 0$ is redundant in this case.

most economic theory is based on the assumption that people are not this myopic, and so neither of these propositions is very appealing from the point of view of economic theory.

Before concluding this section, it should be noted that there is nothing in the model presented here that indicates that one ought to constrain the coefficient estimates in an equation explaining the presidential vote to be the same as those in an equation explaining the congressional vote. The model was presented above with reference to presidential elections, but it could be modified to deal with congressional elections. If this were done, then E_{it}^{D} , for example, would be voter i's expected future economic welfare if the Democratic congressional candidate in the voter's district is elected at time t , and E_{it}^{R} would be similarly defined for the Republican congressional candidate. Equations similar to (2) and (3) could then be postulated for E_{it}^{D} and E_{it}^{R} . There is no reason, however, to expect that the β coefficients that pertain to equations (2) and (3) are the same for both presidential and congressional candidates. There is likewise no reason to expect that all of the other parameters that are involved in the derivation of equation (10) are the same for both presidential and congressional candidates. Consequently, the conclusion here is that one ought <u>not</u> to constrain the coefficient estimates in presidential and congressional equations to be the same.

III. <u>The Data</u>

For the estimation of equation (10), annual data on three economic variables were collected for the 1889-1972 period. The three variables are the unemployment rate (U) , real GNP per capita (G) , and the GNP deflator (P) . Annual data were also collected on the level of the armed forces (AF) and on the total population (POP). The ratio AF/POP was used in some of the estimation work as a measure of the U.S. involvement in wars. Data on V, the Democratic percentage of the two-party vote, were collected for the 21 presidential elections between 1892 and 1972. For the election of 1912, V was taken to be the ratio of Wilson's votes to the sum of the votes for Wilson, Taft, and T. Roosevelt. Wilson, a Democrat, won this election even though V is less than 0.5. For the election of 1924, V was taken to be the ratio of Davis and LaFollette's votes to the sum of the votes for Davis, LaFollette, and Coolidge. All of the data that were used in this study are presented in the Appendix.

Before considering the results of estimating equation (10), it will be useful to examine the data in Table 1. Data on three possible measures of economic performance are presented in Table 1. The first, g_t, has already been defined. The second, $\bar{U}_t$, is the average unemployment rate in the three years prior to election t. $\bar{U}_t$ can be considered to be a measure of how well a party did with respect to employment. The first year of the four-year period between elections is not counted on the grounds that voters may allow a new party in power a one-year grace period before judging the party's performance. The third measure, $\%\Delta P_t$, is a similar measure for inflation, it being the growth rate of the GNP deflator (at an annual rate) in the three years prior to election t. The average value of AF/POP in the three years prior to election t, denoted as $(\overline{AF/POP})_t$, is also presented in Table 1.

If one concentrates only on the performance of the party in power before each election (assuming in effect a value of ρ of ∞) and compares, say, g_t and $\bar{U}_t$ in Table 1, g_t does appear to explain V_t better than does $\bar{U}_t$. There are, for example, at least five cases where a party did well regarding g_t and poorly regarding $\bar{U}_t$ and yet won the election. The two most extreme cases are the periods prior to the elections

TABLE 1

Some Interesting Data

Election Year	t	Party in Power Before Election	V_t	Possible Measures of Economic Performance g_t	$\overline{U}_t$	$\overline{\%\Delta P}_t$	Possible Measure of U.S. Involvement in Wars $\overline{(AF/POP)}_t$
1892	1	R (Harrison)	0.517	7.5	4.1	-2.5	.0006
1896	2	D (Cleveland)	0.478	-3.9	15.5	-3.4	.0006
1900	3	R (McKinley)	0.468	0.9	8.0	3.6	.0021
1904	4	R (McKinley-T. Roosevelt)	0.400	-3.2	4.3	2.0	.0013
1908	5	R (T. Roosevelt)	0.455	-10.0	4.2	2.0	.0013
1912	6	R (Taft)	0.453	4.1	5.7	2.0	.0015
1916	7	D (Wilson)	0.517	6.4	7.2	5.5	.0017
1920	8	D (Wilson)	0.361	-6.1	2.7	10.9	.0155
1924	9	R (Harding-Coolidge)	0.457	-2.2	4.7	-1.4	.0024
1928	10	R (Coolidge)	0.412	-0.6	3.1	-0.4	.0022
1932	11	R (Hoover)	0.591	-15.4	16.1	-7.4	.0021
1936	12	D (Roosevelt)	0.625	13.1	19.6	2.8	.0022
1940	13	D (Roosevelt)	0.550	7.6	16.9	-0.5	.0032
1944	14	D (Roosevelt)	0.538	5.9	2.6	7.2	.0593
1948	15	D (Roosevelt-Truman)	0.524	2.7	3.9	10.1	.0151
1952	16	D (Truman)	0.446	1.3	3.9	3.4	.0180
1956	17	R (Eisenhower)	0.422	0.1	4.7	2.1	.0187
1960	18	R (Eisenhower)	0.501	0.4	5.9	1.9	.0145
1964	19	D (Kennedy-Johnson)	0.613	4.0	5.5	1.3	.0146
1968	20	D (Johnson)	0.496	3.6	3.7	3.3	.0169
1972	21	R (Nixon)	0.382	5.2	5.5	4.5	.0136

Notes: V_t = Democratic share of the two-party vote in election t.

g_t = growth rate of real per capita GNP in the year of election t.

$\overline{U}_t$ = average unemployment rate in the three years prior to election t.

$\overline{\%\Delta P}_t$ = growth rate of the GNP deflator (at an annual rate) in the three years prior to election t.

$\overline{(AF/POP)}_t$ = average value of AF/POP in the three years prior to election t.

of 1936 and 1940, where Roosevelt did quite poorly regarding $\bar{U}_t$ and quite well regarding g_t. In both cases Roosevelt won the elections by large amounts. The other three cases are the periods prior to the elections of 1916, 1944, and 1972, where the incumbents (Wilson, Roosevelt, and Nixon) all won the elections, with Nixon in particular winning by a large amount. Although there are cases in Table 1 where a party did well regarding $\bar{U}_t$ and poorly regarding g_t and won the election, it is fairly obvious from a causal clance at the data in the table that V_t appears to be better explained by g_t than by $\bar{U}_t$ or by various combinations of $\bar{U}_t$ and $\overline{\%\Delta P}_t$. This is, however, only a causal impression, and it is implicitly based on a value of ρ of ∞. The main purpose of the estimation work in the next section is to see if estimating equation (10) under alternative assumptions about ρ and about the measures of economic performance leads to better results than, say, merely estimating equation (10)'.

IV. The Results

A fairly systematic procedure was followed for estimating equation (10). First, values of ρ of 0.0, 0.5, 1.0, and ∞ were tried for each measure that was considered. Second, the following variables were tried as possible measures of economic performance (G denotes real per capita GNP , U denotes the unemployment rate, and P denotes the GNP deflator): the growth rate of G in the year of the election, the growth rate of G in the two-year period before the election, the growth rate of G in the three-year period before the election, the growth rate of G over the entire four-year period, the same four variables for the growth rate of P , the same four variables for the change in U ,[4] the value of U in the year of the election, the average value of U in the two-year period before the election, the average value of U in the three-year period before the election, and the average value of U over the entire four-year period.

Another variable that was considered is the ratio of the armed forces (AF) to the total population (POP) , which was taken as a proxy for the U.S. involvement in wars. If a voter's expected future welfare depends on her or his expectation of future U.S. involvement in wars and if this expectation is formed for each party on the basis of the party's past involvements, then AF/POP should be a good measure to use in equation (10). Eight different combinations of AF/POP were tried: the value of AF/POP in the year of the election, the average value of AF/POP in the two-year period before the election, the average value of AF/POP in the three-year period before the election, the average value of AF/POP over the entire four-year period, the change in AF/POP in the year of the election, the change in AF/POP in the two-year period before the election, the change in AF/POP in the three-year period before the election, and the change in AF/POP over the entire four-year period.

Most of the estimation work was carried out under the assumption that $\beta_2 = \beta_4 = 0$. In order to be able to estimate $\alpha_1\beta_2$ and $\alpha_1\beta_4$ in equation (10), the sample period had to begin in 1916, which meant that the number of observations was fairly small relative to the number

[4]The change in U over the entire four-year period, for example, is defined to be the difference between U in the year of the election and U in the year of the previous election.

of coefficients estimated. In none of the initial regressions that were run were significant estimates of $\alpha_1\beta_2$ and $\alpha_1\beta_4$ obtained for any of the measures, and so it was decided fairly early to assume that $\beta_2 = \beta_4 = 0$. Most of the estimation work was also carried out under the assumption that $\beta_1 = \beta_3$. In most of the initial regressions that were run the hypothesis that $\beta_1 = \beta_3$ was accepted at the 95 percent confidence level (under the assumption that ϵ_t in equation (10) is normally distributed), and so it was also decided fairly early to assume that $\beta_1 = \beta_3$.

For much of the work more than one variable was tried at a time; in other words, M_j was assumed to be a function of more than just one variable. Assume, for example, that M_j is a linear function of two variables, X_j and Z_j:

$$(11) \qquad M_j = \psi_0 + \psi_1 X_j + \psi_2 Z_j .$$

Assuming $\beta_2 = \beta_4 = 0$ and $\beta_1 = \beta_3$ and substituting (11) into (10) yields:[5]

$$(12) \qquad V_t = \alpha_0 + \alpha_1\beta_1\psi_0\left[\frac{1}{(1+\rho)^{t-td1}} - \frac{1}{(1+\rho)^{t-tr1}}\right] + \alpha_1\beta_1\psi_1\left[\frac{X_{td1}}{(1+\rho)^{t-td1}} - \frac{X_{tr1}}{(1+\rho)^{t-tr1}}\right] + \alpha_1\beta_1\psi_2\left[\frac{Z_{td1}}{(1+\rho)^{t-td1}} - \frac{Z_{tr1}}{(1+\rho)^{t-tr1}}\right] + \epsilon_t .$$

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[5]If (11) is substituted into (10) without assuming that $\beta_2 = \beta_4 = 0$ and $\beta_1 = \beta_3$, an equation results in which not all of the coefficients are identified. The coefficients do become identified, however, (except for α_1) if, say, it is assumed that $\psi_0 = 0$, $\psi_1 = 1$, and $\psi_2 = 0$. This latter assumption was made in the initial estimation work before the decision was made to assume that $\beta_2 = \beta_4 = 0$ and $\beta_1 = \beta_3$. In other words, in the initial estimation work only one variable was tried at a time as a possible measure of economic performance.

Although it is not possible in equation (12) to estimate $\alpha_1\beta_1$ and the ψ coefficients separately, it is possible for values of ρ other than zero to estimate α_0, $\alpha_1\beta_1\psi_0$, $\alpha_1\beta_1\psi_1$, and $\alpha_1\beta_1\psi_2$. For a value of ρ of zero, the first term in brackets is always zero, thus making the estimation of $\alpha_1\beta_1\psi_0$ impossible. It should also be noted that for a value of ρ of infinity, the first term in brackets in equation (12) is equal to one if the Democrats are in power and to minus one if the Republicans are in power. It is thus possible in this case to interpret the term as being a dummy variable that will pick up any pure incumbency effects.

The systematic part, or second phase, of the estimation work consisted of estimating equation (12), both with and without the first term in brackets being included, for the four values of ρ and the various variables mentioned above. Sometimes only one variable was used at a time as a possible measure of economic performance; sometimes two; and sometimes three. Two other variables were also included in some of the regressions. One is the simple time trend, t, and the other is a dummy variable, denoted as $DPER_t$, that takes on a value of one if there is a Democratic incumbent and he[6] is running himself for election, of minus one if there is a Republican incumbent and he is running himself for election, and of zero otherwise. The time trend was added to see if there is a trend in V_t not captured by the other variables in the equation, and $DPER_t$ was added to see if there is a pure incumbency advantage to the president himself running for election. Adding a time trend to the equation is also equivalent to detrending all of the variables in the equation, and this may

[6]For the sample period considered in this study all of the presidents have been men, and so I have chosen to use the masculine pronouns for purposes of the present discussion.

be important to do for a variable like AF/POP , which has a positive trend over the sample period. In terms of the model in Section II, both t and $DPER_t$ (multiplied by their appropriate coefficients) should be considered as being systematic parts of ϵ_t that are taken out of ϵ_t and included directly in the equation.

Finally, experiments were performed in the second phase of the estimation work that were designed to try to pick up possible asymmetrical effects. If, for example, g_j is the basic measure of economic performance, it may still be that voters treat, say, positive values of g_j differently than they treat negative values. If a voter is employed, an expanding economy may have only a small positive effect on her or his expected future welfare. A contracting economy, on the other hand, may have a large negative effect on expected future welfare if the voter fears becoming unemployed. The situation is reversed for an unemployed voter, but since there have always been many more employed than unemployed voters, one may observe asymmetrical effects in the aggregate. It is easy to test for possible asymmetrical effects. If, for example, g_j is the basic measure of economic performance used, then one can construct a second variable, denoted, say, as g_j^+ , that is equal to $g_j - \bar{g}$ if g_j is greater than $\bar{g}$ and to zero otherwise. Including both g_j and g_j^+ in the equation (in equation (11) first and then substituting into equation (12)) provides a test of whether the coefficient of g_j is different for values of g_j above and below $\bar{g}$. If the coefficient is different, then the coefficient estimate of g_j^+ should be significantly different from zero. Variables like g_j^+ for various measures of performance and various values of $\bar{g}$ were included in some of the regressions to test for asymmetrical efforts.

All of the above experiments were carried out for two sample periods: 1896-1972 (20 observations) and 1916-1972 (15 observations). The second sample period is the one that was used in the first phase of the estimation work before it was assumed that $\beta_2 = \beta_4 = 0$. Two sample periods were used in the second phase of the estimation work to provide some indication of the sensitivity of the results to the choice of the sample period. The first sample period began in 1896 rather than in 1892 because of data limitations. If the sample period had begun in 1892, data on the economic variables before 1889 would have been needed for all of the regressions for which ρ was not taken to be ∞.

Space limitations prevent very many of the equation estimates from being presented, but the results are actually quite easy to summarize. The basic results are as follows:

1. The growth rate of real per capita GNP in the year of the election, g_t, was definitely the best measure of economic performance in terms of explaining V_t. None of the other measures that were tried explained more of the variance of V_t than did g_t or were significant[7] when included together with g_t in the equation. (g_t remained significant when other measures were included together with it in the equation.)
2. For g_t, a value of ρ of ∞ gave the best results. This was generally true of the other measures as well, although in some cases values of 0.5 and 1.0 gave better results than did the value of ∞.

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[7] A variable is said to be "significant" here if its coefficient estimate is significantly different from zero at the 95 percent confidence level under the standard assumptions of the classical linear regression model.

3. None of the variables that were added to test for asymmetrical effects were significant. For g_t , for example, values of $\bar{g}$ of -2.0, -1.0, 0.0, 1.0, 2.0, 3.0 and 4.0 were tried, and none of the g_t^+ variables associated with these values were close to being significant.
4. The time trend was generally significant for the 1916-1972 sample period and generally insignificant for the 1896-1972 sample period. The coefficient estimates of the time trend were generally positive.
5. The various combinations of AF/POP mentioned above were never close to being significant, even with the time trend included in the equations.
6. The dummy variable $DPER_t$ and the first term in brackets in equation (12) are fairly collinear, especially for a value of ρ of ∞ , and the two variables were not significant when included together in the equations. When included separately, both variables were generally significant. $DPER_t$ did, however, tend to dominate the term in brackets in the sense of having a higher t statistic associated with it when the variables were included together in the equations.
7. Just for fun, the lagged dependent variable, V_{t-1} , was added to some of the regressions, as a test for possible lagged effects, and it was never close to being significant.
8. Except for the result mentioned in point 4, all of the above results were true of both sample periods.

Some of the equation estimates are presented in Table 2. Eleven regressions are presented in the table. Regressions 1, 2, 3, 4, and 9 are for the 1896-1972 sample period; regressions 5, 6, 7, 8, and 10 are for the 1916-1972 sample period; and regression 11 is for the sample period that includes only the last five elections, 1956-1972. Regressions 4 and 8

TABLE 2

Some Equation Estimates

Basic Equation Estimated: $V_t = a_0 + a_1 DPER_t + a_2 t + a_3 \frac{M_{tdl}}{(1+\rho)^{t-tdl}} + a_4 \frac{M_{trl}}{(1+\rho)^{t-trl}} + e_t$

	Regression Number										
	1	2	3	4	5	6	7	8	9	10	11
Sample Period	1896-1972	1896-1972	1896-1972	1896-1972	1916-1972	1916-1972	1916-1972	1916-1972	1896-1972	1916-1972	1956-1972
Measure Used	g_t	g_t	g_t	Δu_t	g_t	g_t	g_t	Δu_t	g_t	g_t	g_t
ρ	∞	∞	0.5	∞	∞	∞	0.5	∞	∞	∞	∞
$\hat{a}_0$	.448 (17.85)	.450 (17.70)	.469 (18.01)	.455 (16.11)	.383 (13.75)	.375 (12.82)	.437 (10.31)	.375 (10.34)	.459 (35.19)	.455 (35.02)	.476 (18.30)
$\hat{a}_1$	.0309 (2.16)	.0230 (1.36)	.0262 (1.61)	.0458 (2.98)	.0321 (3.26)	.0409 (3.01)	.0219 (1.28)	.0613 (5.11)	0	0	0
$\hat{a}_2$	.00151 (0.81)	.00100 (0.51)	.00004 (0.02)	.00155 (0.73)	.00492 (2.73)	.00565 (2.87)	.00159 (0.56)	.00597 (2.54)	0	0	0
$\hat{a}_3$	.00765 (3.86)	.01005 (2.98)	.00545 (3.24)	-.0133 (2.79)	.01154 (8.02)	.00977 (4.13)	.00743 (4.23)	-.0247 (5.98)	.00923 (4.46)	.01197 (6.08)	.01948 (2.53)
$\hat{a}_4$	a	-.00628 (2.48)	a	a	a	-.01299 (6.17)	a	a	a	a	a
SE	.0469	.0473	.0507	.0535	.0292	.0293	.0471	.0370	.0524	.0431	.0578
R^2	.661	.678	.605	.560	.899	.907	.737	.838	.525	.740	.681
DW	1.95	1.88	1.90	1.99	2.02	2.16	1.93	1.98	1.39	1.33	2.36

TABLE 2 (continued)

Predicted Values of V_t

Sample Period	Actual Values of V_t	Regression Number 1	2	3	4	5	6	7	8	9	10	11
1896	.478	.421	.414	.420	.449					.423		
1900	.468	.415	.425	.424	.394					.451		
1904	.400	.447	.451	.451	.436					.488		
1908	.455	.531	.518	.517	.533					.551		
1912	.453	.394	.407	.416	.391					.421		
1916	.517	.538	.544	.515	.558	.524	.518	.497	.562	.518	.531	
1920	.361	.413	.397	.426	.417	.352	.361	.390	.329	.402	.382	
1924	.457	.447	.450	.432	.458	.420	.413	.415	.431	.479	.481	
1928	.412	.467	.464	.458	.483	.440	.440	.437	.457	.465	.463	
1932	.591	.551	.535	.517	.530	.583	.597	.533	.569	.601	.639	
1936	.625	.597	.617	.623	.563	.626	.612	.652	.587	.580	.612	
1940	.550	.556	.563	.574	.556	.568	.564	.587	.578	.529	.546	
1944	.538	.545	.547	.553	.532	.553	.553	.559	.537	.514	.526	
1948	.524	.522	.515	.527	.526	.520	.527	.525	.528	.484	.487	
1952	.446	.482	.479	.487	.484	.477	.478	.487	.478	.471	.470	
1956	.422	.442	.444	.447	.432	.434	.430	.448	.407	.458	.454	.474
1960	.501	.472	.466	.470	.483	.467	.472	.467	.482	.455	.450	.468
1964	.613	.538	.532	.516	.537	.555	.562	.517	.562	.496	.503	.553
1968	.496	.505	.507	.488	.489	.524	.524	.494	.499	.492	.498	.546
1972	.382	.408	.415	.428	.438	.394	.385	.427	.431	.410	.392	.373

Notes: t-statistics in absolute value are in parentheses.

g_t = growth rate of real per capita GNP in the year of the election.

Δu_t = change in the unemployment rate in the year of the election.

0 = coefficient estimate constrained to be zero.

a = $\hat{a}_4$ constrained to be equal to $-\hat{a}_3$.

SE = estimate of the standard error of the regression.

DW = Durbin-Watson statistic.

All of the equations were estimated by ordinary least squares.

use the change in the unemployment rate in the year of the election, Δu_t, as the measure of economic performance; the other regressions are g_t as the measure of performance. Regressions 3 and 7 use a value of ρ of 0.5; the other regressions use a value of ρ of ∞. Regressions 2 and 6 are not based on the constraint that $\beta_1 = \beta_3$, and regressions 9, 10, and 11 exclude $DPER_t$ and t as explanatory variables. Predicted values of V_t for all of the regressions are also presented in Table 2.

The results in Table 2 are fairly self explanatory. They show that the use of g_t as the measure of performance gives somewhat better results than the use of Δu_t, that the use of a value of ∞ for ρ gives somewhat better results than the use of a value of 0.5, and that the constraint that $\beta_1 = \beta_3$ is clearly not binding. Δu_t was the next best measure of performance after g_t (although it was not significant when included together with g_t in the equation), and the inclusion of regressions 4 and 8 in the table is designed to show how much explanatory power is lost in going from g_t to the next measure of performance. The inclusion of regressions 3 and 7 in the table is designed to show how much explanatory power is lost in going from $\rho = \infty$ to $\rho = 0.5$.

Consider now regressions 1 and 5, the two best fitting regressions for the two sample periods. The coefficient estimate of $DPER_t$ is about .03 for the two regressions, which means that an incumbent running himself has an initial advantage of about 3 percentage points. The coefficient estimate of t is about three times larger for the second sample period than for the first, and associated with this difference is a fairly large difference in the estimates of the constant terms. The results in this respect are thus somewhat sensitive to the choice of the sample period.[8]

The coefficient estimate of g_t, $\hat{a}_3$, is less sensitive to the choice of the sample period. It is larger for the second sample period than for the first, but in both cases the estimate is clearly significant. The sensitivity of $\hat{a}_3$ to the choice of the sample period can also be examined by comparing regressions 9, 10, and 11, where the estimate is .00923 for the first period, .01197 for the second period, and .01948 for the period that consists only of the last five elections.

The estimate of the standard error is .0469 for regression 1 and .0292 for regression 5. Regression 5 is in fact a remarkable regression in terms of goodness of fit. 89.9 percent of the variance of V_t is explained by the regression, and the only elections in which the winner is not predicted correctly are the elections of 1960 and 1968, both of which are very close.

Since Kramer also found the rate of inflation in the year of the election to be important in explaining the congressional vote, it is of interest here to present the results of adding this variable to regressions 1 and 5. Let p_t denote the rate of growth of the GNP deflator in the year of the election. When p_t was included in the appropriate way in regression 1 (assuming $\rho = \infty$ and $\beta_1 = \beta_3$) as an additional measure of performance, its coefficient estimate was -.00237, with a t-statistic of -1.07. The other estimates were (t-statistics in absolute value in parentheses): $\hat{a}_0 = .452$ (17.82), $\hat{a}_1 = .0359$ (2.39), $\hat{a}_2 = .00137$ (0.73),

[8] With respect to regressions 1 and 5, the Chow test rejected at the 95 percent confidence level the hypothesis that the coefficients in the equations are the same before and after 1916. There may thus have been a structural shift in the equation around 1916, especially with respect to the coefficient of the time trend and the constant term. It should be noted, however, as mentioned in point 8 above, that the main conclusions of this study are not sensitive to the choice of one or the other of the sample periods.

$\hat{a}_3$ = .00806 (4.01) , SE = .0467 , R^2 = .685 , DW = 2.08 . When p_t was included in regression 5, its coefficient estimate was .00035, with a t-statistic of 0.18. The other estimates were: $\hat{a}_0$ = .379 (9.86) , $\hat{a}_1$ = .0317 (3.03) , $\hat{a}_2$ = .00517 (2.22) , $\hat{a}_3$ = .01154 (7.66) , SE = .0306 , R^2 = .900 , DW = 2.01 . It is clear from these results that p_t is not significant and has little effect on the coefficient estimates of the other variables in the equation. This conclusion was also reached, of course, for the other combinations of the GNP deflator mentioned above. The results obtained in this study rather clearly indicate that the rate of inflation does not have an independent effect on the presidential vote.

For regressions like 1 and 5 it is possible to calculate the value of g_t that the party in power has to achieve to have the predicted value of V_t be, say, two standard errors away from 0.5 (above 0.5 for the Democrats and below 0.5 for the Republicans). If, for example, the president himself is not running for election, then this value for the Democrats is $(.5 + 2 \cdot SE - \hat{a}_0 - \hat{a}_2 t)/\hat{a}_3$ and for the Republicans is $(.5 - 2 \cdot SE - \hat{a}_0 - \hat{a}_2 t)/\hat{a}_4$. These values are, of course, a function of t , unless t is excluded from the regression, as in the case of regressions 9, 10, and 11. A sample of these values is as follows.

Values of g_t necessary to have the predicted value of V_t be two standard errors away from 0.5 (assuming that the president himself is not running):

	t = 11 (1932)		t = 21 (1972)	
	D	R	D	R
Regression 1	16.9	7.6	14.9	9.6
Regression 5	10.5	-0.4	6.2	3.9
Regression 9	15.8	6.9	15.8	6.9
Regression 10	11.0	3.4	11.0	3.4
Regression 11	7.2	4.7	7.2	4.7

An important characteristic of these figures is that in each case the necessary value of g_t is smaller for the Republicans than for the Democrats. For regressions 1 and 5 this is, of course, less true for $t = 21$ than it is for $t = 11$ because of the positive coefficient estimate of the time trend in the regressions.

It is easy to see from Table 1 why the data indicate that the necessary value of g_t is smaller for the Republicans. The elections between 1916 and 1972 that the Republicans lost when they were in power are the elections of 1932 (Hoover, $g_t = -15.4$) and 1960 (Nixon, $g_t = 0.4$). Nixon lost the election of 1960 by a very small amount. The Democrats when they were in power lost the elections of 1920 (Cox, $g_t = -6.1$), 1952 (Stevenson, $g_t = 1.3$), and 1968 (Humphrey, $g_t = 3.6$). The data thus indicate that it is easier for the Democrats to lose with a moderate value of g_t than it is for the Republicans, and the regressions are in part picking up this fact. The elections of 1936 and 1972 also help to explain this result. Roosevelt in 1936 got 62.5 percent of the vote with a g_t of 13.1, whereas Nixon in 1972 got 61.8 percent of the vote with a g_t of 5.2. The landslide Republican vote thus corresponded to a much smaller value of g_t than did the landslide Democratic vote.

The Republican bias that appears inherent in the data means in terms of the theoretical model in Section II that $|a| < b$. (Remember that $a < 0$ and $b > 0$.) The condition that $|a| < b$ means that more than half of the voters have values of ψ_i that are below zero. From equation (4), $\psi_i = \gamma_i - \xi_i^D + \xi_i^R$, where γ_i appears in equation (1) and ξ_i^D and ξ_i^R appear in equations (2) and (3), respectively. If for exactly half of the voters ξ_i^D is greater than ξ_i^R , then the condition that $|a| < b$ means that more than half of the voters have values of γ_i that are below zero. This is a world in which voters have an average, other things being equal, the same expectations about Democrats and Republicans, but on average just prefer a Republican president to a Democratic president. If, on the other hand, exactly half of the voters have values of γ_i that are below zero, then the condition that $|a| < b$ means that for more than half of the voters ξ_i^D is greater than ξ_i^R . This is a world in which voters on average are indifferent between a Republican and Democratic president, but have on average, other things being equal, higher expectations about Democrats than Republicans. It is not possible from the present results to distinguish between these two worlds, or other possible worlds in between. All that can be said here is that the Republican bias in the data must be due to either an inherent Republican bias in the system or to voters on average having, other things being equal, greater expectations about the Democrats.

Although a time trend has been included in, say, regressions 1 and 5 in Table 2, the continuation of this trend should not necessarily be assumed in any extrapolations beyond the sample period. The fact that there may have been a trend in the relationship between V_t and the explanatory variables in the equations during the sample period does not necessarily mean that there will continue to be one in the future. Clearly, any long run extrapolation of the equations under the assumption that the trend will continue will lead to absurd results.

Finally, although regression 5 is a remarkable fitting equation, it does have properties regarding the size of the Republican bias that do not appear very reasonable. As presented above, the regression implies for $t = 11$ that the value of g_t that is necessary to have the predicted value of V_t be two standard errors away from 0.5 for the Republicans is only -0.4 percent. This is in contrast to the value of 7.6 percent for regression 1. The reason for this large difference is, of course, the large difference in the estimates of the coefficient of the time trend and the constant term in the two equations. Although, as mentioned in footnote 8, the Chow test rejected the hypothesis that the coefficients in the equation are the same before and after 1916, it is not clear that one should place too much confidence on the estimate of the size of the Republican bias that is implicit in regression 5.

V. Conclusion

The caveats that pertain to a study of the present kind need hardly be emphasized. The main conclusions of this study, which are presented in the last two paragraphs of the Introduction, are based on only 20 observations that span a period of 80 years. The overall results do rather strongly indicate, however, that the growth rate of per capita income in the year of the election has an important effect on the presidential vote. The results also rather strongly indicate that there exists a Republican bias in the system, but the estimated size of this bias is sensitive to the sample period used. It should also be noted that the estimated standard error for, say regression 5 in Table 2 is large enough (2.92 percentage points) to allow non economic events to play an important role in presidential elections even if one knew for certain that the equations were correctly specified and estimated.

One final note about the results in this paper. If g_t is the correct measure of economic performance used by voters, then the optimal policy of an administration that is solely interested in maximizing the probability of its party winning the next presidential election is simply to maximize the growth rate of real per capita GNP in the year of the election, assuming that the process of maximizing g_t does not affect in a negative way any of the non economic variables that influence the presidential vote. Given a macroeconometric model, maximizing g_t is a straightforward optimal control problem. It is now possible to solve optimal control problems for most models, and I have computed, using a new model [1] that I have recently developed, the optimal economic policy of an administration that is solely interested in maximizing g_t. This policy is for the administration at the beginning of its four-year period in office to start bringing the economy to a recession, then to have the economy reach a trough sometime during the first three quarters of the year preceding the election year, and then finally to stimulate the economy strongly from the trough to the time of the election. The optimal control result indicates that if an administration were completely unconstrained by the Congress and the Federal Reserve, it could achieve about a 20 percent growth rate of real GNP in the year of the election. These experiments are described in Section III of the paper mentioned in footnote **.

APPENDIX

The data that were used in this study are presented in Table A. The data on G , U , and P were taken from [6]. For U , the Lebergott series was used between 1890 and 1928 and the BLS series was used from 1929 on (pp. 212-213). For G , the Kendrick series between 1889 and 1908 was spliced to the BEA series from 1909 on (pp. 182-183). The Kendrick series was multiplied by 1.02542 to splice it to the BEA series. For P , the Kendrick series between 1889 and 1928 was spliced to the BEA series from 1929 on (pp. 222-223). The splicing multiple in this case was 1.03055. The data in [6] were updated through 1972 for purposes here. The data on AF between 1890 and 1960 were taken from [3], Tables A-3 and A-15, and between 1961 and 1972 from various issues of Economic Indicators. The data on POP between 1889 and 1959 were taken from [6] (pp. 200-201), between 1960 and 1969 from [7], Table 2, and between 1970 and 1972 from the July 1975 issue of Economic Indicators. The series on V was computed from the data in [8] (p. 364) and [9] (p. 682).

TABLE A

The Data

G = real per capita GNP (1958 dollars)
U = civilian unemployment rate
P = GNP deflator (1958 = 100.0)
AF = level of the armed forces in thousands
POP = level of the population, including armed forces abroad, in thousands
V = Democratic share of the two-party vote

Year	G	U	P	AF	POP	V
1889	825	N.A.	25.9	N.A.	61775	
1890	869	4.0	25.4	39	63056	
1891	889	5.4	24.9	38	64361	
1892	956	3.0	24.0	39	65666	0.517
1893	891	11.7	24.5	39	66970	
1894	850	18.4	23.0	42	68275	
1895	933	13.7	22.7	42	69580	
1896	897	14.4	22.1	42	70885	0.478
1897	965	14.5	22.2	44	72189	
1898	968	12.4	22.9	236	73494	
1899	1039	6.5	23.6	100	74799	
1900	1048	5.0	24.7	124	76094	0.468
1901	1147	4.0	24.5	115	77585	
1902	1135	3.7	25.4	108	79160	
1903	1170	3.9	25.7	106	80632	
1904	1133	5.4	26.0	107	82165	0.400
1905	1194	4.3	26.5	109	83820	
1906	1307	1.7	27.2	109	85437	
1907	1303	2.8	28.3	112	87000	
1908	1172	8.0	28.1	123	88709	0.455
1909	1291	5.1	29.1	134	90492	
1910	1300	5.9	29.9	141	92407	
1911	1312	6.7	29.7	145	93868	
1912	1366	4.6	30.9	149	95331	0.453
1913	1351	4.3	31.1	157	97227	
1914	1267	7.9	31.4	163	99118	
1915	1238	8.5	32.5	174	100549	
1916	1317	5.1	36.5	181	101966	0.517
1917	1309	4.6	45.0	719	103266	
1918	1471	1.4	52.6	2904	103203	
1919	1401	1.4	53.8	1543	104512	
1920	1315	5.2	61.3	380	106466	0.361

Notes: N.A. = not available.

TABLE A (continued)

	G	U	P	AF	POP	V
1921	1177	11.7	52.2	362	108541	
1922	1345	6.7	49.5	276	110055	
1923	1482	2.4	50.7	255	111950	
1924	1450	5.0	50.1	267	114113	0.457
1925	1549	3.2	51.0	262	115832	
1926	1618	1.8	51.2	256	117399	
1927	1594	3.3	50.0	259	119038	
1928	1584	4.2	50.4	262	120501	0.412
1929	1671	3.2	50.6	260	121770	
1930	1490	8.7	49.3	260	123188	
1931	1364	15.9	44.8	260	124149	
1932	1154	23.6	40.2	250	124949	0.591
1933	1126	24.9	39.3	250	125690	
1934	1220	21.7	42.2	260	126485	
1935	1331	20.1	42.6	270	127362	
1936	1506	16.9	42.7	300	128181	0.625
1937	1576	14.3	44.5	320	128961	
1938	1484	19.0	43.9	340	129969	
1939	1598	17.2	43.2	370	131028	
1940	1720	14.6	43.9	540	132122	0.550
1941	1977	9.9	47.2	1620	133402	
1942	2208	4.7	53.0	3970	134860	
1943	2465	1.9	56.8	9020	136739	
1944	2611	1.2	58.2	11410	138397	0.538
1945	2538	1.9	59.7	11430	139928	
1946	2211	3.9	66.7	3450	141389	
1947	2150	3.9	74.6	1590	144126	
1948	2208	3.8	79.6	1456	146631	0.524
1949	2172	5.9	79.1	1616	149188	
1950	2342	5.3	80.2	1650	151684	
1951	2485	3.3	85.6	3097	154287	
1952	2517	3.0	87.5	3594	156954	0.446
1953	2587	2.9	88.3	3547	159565	
1954	2506	5.5	89.6	3350	162391	
1955	2650	4.4	90.9	3048	165275	
1956	2652	4.1	94.0	2857	168221	0.422
1957	2642	4.3	97.5	2797	171274	
1958	2569	6.8	100.0	2637	174141	
1959	2688	5.5	101.6	2552	177073	
1960	2699	5.5	103.3	2514	180671	0.501
1961	2706	6.7	104.6	2572	183691	
1962	2840	5.5	105.8	2828	186538	
1963	2912	5.7	107.2	2738	189242	
1964	3028	5.2	108.8	2739	191889	0.613
1965	3180	4.5	110.9	2723	194303	
1966	3348	3.8	113.94	3123	196560	
1967	3398	3.8	117.59	3446	198712	
1968	3521	3.6	122.30	3535	200706	0.496
1969	3580	3.5	128.20	3506	202677	
1970	3526	4.9	135.24	3188	204878	
1971	3605	5.9	141.35	2816	207053	
1972	3795	5.6	146.12	2449	208846	0.382

REFERENCES

[1] Fair, Ray C. A Model of Macroeconomic Activity. Volume II: The Empirical Model (Cambridge: Ballinger Publishing Co., 1976).

[2] Kramer, Gerald H. "Short-Term Fluctuations in U.S. Voting Behavior, 1896-1964," The American Political Science Review, LXV (March 1971), 131-143.

[3] Lebergott, Stanley. Manpower in Economic Growth: The American Record Since 1800 (New York: McGraw-Hill Book Co., 1964).

[4] Stigler, George J. "General Economic Conditions and National Elections," The American Economic Review, LXIII (May 1973), 160-167.

[5] Tufte, Edward R. "Determinants of the Outcomes of Midterm Congressional Elections," The American Political Science Review, LXIX (September 1975), 812-826.

[6] U.S. Bureau of Economic Analysis. Long Term Economic Growth 1869-1970 (Washington, D.C., 1973).

[7] U.S. Bureau of the Census. Population Estimates and Projections, Current Population Reports, Series P-25, No. 521, May 1974.

[8] ________. Statistical Abstract of the United States: 1973, 94th edition (Washington, D.C., 1973).

[9] ________. Historical Statistics of the United States, Colonial Times to 1957 (Washington, D.C., 1960).