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FLUCTUATIONS IN U.S. VOTING BEHAVIOR: EVIDENCE FROM PRESIDENTIAL ELECTIONS

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Abstract

The relationship between economic conditions and voting behavior is evaluated in the context of U.S. presidential elections, 1916-1984. The approach represents a reapplication of the model employed by Gerald Kramer (1971) in an earlier study of congressional elections. A critique of the Kramer model by George Stigler (1973) is reconsidered in this different context, with application of a Chow test and analysis of the predictive errors in fact providing strong support for Kramer's basic model. The systematic explanatory power that is evidenced opposes Stigler's claim that the framework lacks robustness.

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The proposition that voters are influenced by economic conditions has found the support at least of Richard Nixon, who blames his defeat in the 1960 presidential contest on just such a phenomenon:

> "In October, usually a month of rising employment, the jobless roles increased by 452,000. All the speeches, television broadcasts and precinct work in the world could not counteract that one hard fact."
>
> (Nixon, 1962, pp. 310-311)

However, it is the pioneering study of congressional elections by Gerald Kramer (1971) that provides the first major attempt to actually quantify the extent of economic influences on election outcomes. Kramer's analysis indicates economic fluctuations (over the year before elections) account for approximately half the variance of the congressional vote. Real personal income is found to be the most important here, with changes in unemployment having no independent effect; presumably due to its being dominated by the former more comprehensive prosperity measure. An additional role for the inflation rate, while not found in the original set of results, is nevertheless suggested in revised estimates--obtained by Kramer after correction of an error in the data.[1]

Kramer's study has in fact initiated a most extensive line of empirical literature devoted to refining and extending the insights developed for the analysis of election outcomes.[2] However, notable opposition to Kramer's

approach is voiced by George Stigler (1973), in a critique based on the sensitivity of the results to the particular definition of variables and sample period chosen -- a critique which continues to be more often referenced than questioned.[3]

1. Set-up of the Model

The purpose of this paper is to reconsider the Kramer specification contested by Stigler with reference to U.S. presidential elections over the period 1916-1984.[4] Here, the Democratic share of the popular vote in presidential elections is taken as the dependent variable, with independent variables being chosen to capture the effects both of economic performance[5] and the possible institutional advantage of incumbency. These factors, together with random influences, are then seen as resulting in fluctuations in the party's voting share about the 'normal' long run average vote that would otherwise be received -- a base vote (V) that is essentially a measure of the underlying partisanship of the electorate.

We have

$$VOTE_t = V + \alpha.PI + \beta(I.\Delta t) + u_t \qquad (1)$$

where VOTE is the Democratic percentage of the two party vote,

PI denotes the presidential incumbency dummy, equal to +1 if there is a Democrat himself standing for re-election, -1 if there is a Republican, and 0 if else (i.e., no incumbent standing),

I is an incumbency variable, equal to one for a Democratic administration, and minus one for a Republican one,

Δt is the proportionate change in some economic performance measure,

α, β, V are parameters of the model,

u_t is an error term.

2. The Choice of Economic Variables

Initial estimation of the model is carried out for a basic data set of economic variables comprising the growth rate of real GNP (G), the change in the unemployment rate (U), and the growth rate of the GNP deflator, or inflation rate (P). Further allowance is made for an effect of U.S. involvement in wars, of changes in the average marginal tax rate (T), and of labor unrest as measured by the incidence of strikes (S). The influence of wars is proxied by the change in the ratio of the armed forces to the total population (AF), as well as by a dummy variable (WAR). With the exception of WAR -- which is set equal to one if there is a war during the period of incumbency and zero else -- each variable is defined over one- and two-year periods prior to presidential elections. For the GNP variables, G1 and G2 denote the respective growth rates of real GNP over these one and two year periods. Analogous definitions apply to the unemployment (U1 and U2), inflation (P1 and P2), armed forces (AF1 and AF2), tax (T1 and T2), and strike (S1 and S2) variables. Finally, in order to allow for an influence of very short run economic fluctuations, the annualized growth rate of real GNP and of the GNP deflator in the second

and third quarters of the election year are added to the variable set -- labeled as G4 and P4 below.[6] Each variable in turn is then included with the constant and incumbency terms in a succession of OLS regressions. Here a significant role is found for each of the GNP and unemployment terms, but none of the other variables is significant in the results presented in Table 1.[7] The best fit is in fact that obtained using the G1 variable, where the $\bar{R}^2$ is 0.62. Accordingly the initial selection has G1 as the economic variable with the greatest individual explanatory power.

However, in order to test for joint significance of more than one economic variable, a second set of results is obtained. In this case, the procedure is once again to search over the full range of economic variables -- this time successively adding each to the specification that already includes G1. The results in Table 2 show that the inflation rate over the two year period before each election (P2) is the only variable that is statistically significant when included with G1. Meanwhile, G1 remains highly significant in that regression -- thereby helping to confirm the initial selection of this variable. For specifications with and without the statistically insignificant incumbency term we have respectively

$$\underset{}{\text{VOTE}} = \underset{(0.011)}{0.477} + \underset{(0.014)}{0.020\ \text{PI}} + \underset{(0.002)}{0.011\ \text{I.G1}} - \underset{(0.002)}{0.005\ \text{I.P2}} \qquad (2a)$$

$$\bar{R}^2 = 0.73 \qquad \text{DW} = 2.32$$

and

$$\underset{}{\text{VOTE}} = \underset{(0.011)}{0.473} + \underset{(0.002)}{0.012\ \text{I.G1}} - \underset{(0.002)}{0.004\ \text{I.P2}} \qquad (2b)$$

$$\bar{R}^2 = 0.71 \qquad \text{DW} = 1.95$$

(Standard errors are in parentheses)

It may be noted that the redundancy of further income or unemployment variables is explained by the high degree of multicollinearity between these terms. Indeed, Arthur Okun (1973) stresses that over the period 1948-71 the correlation between annual changes in real GNP and annual changes in the unemployment rate is very close to -0.9 -- ensuring that, when both an unemployment and a real income variable are used, unstable coefficients are to be expected. The insignificance of the incumbency term itself concurs with Kramer's own findings for the congressional case. However, given its presence in the reported Kramer equations, it is retained here also for purposes of comparison.[8] The expected simularity in performance to that of the specification with GNP growth and inflation alone (equation (2b)) is in fact seen to ensue.

3. Analysis with the Income and Inflation Variables

The performance of the model as applied to presidential elections is addressed through the following examination of its forecasting and predictive qualities. First, a Chow test is undertaken in order to test for stability over the sample.[9] The technique employed is to successively exclude three observations from the sample, with the test --based on the relative size of the residual errors -- addressing the null hypothesis that the successive groups of three observations belong to the same structure as the observations in the remainder of the sample.[10] By testing sequentially over the full sample, no prior restriction is placed on the period most likely to feature instability. With e'e denoting the residual sum of

squares over the full 1916-1984 period, and $e_1'e_1$ the residual sum of squares over the restricted period, the test statistic is defined -- for each set of three excluded observations -- as

$$\frac{(e'e - e_1'e_1)/f}{e_1'e_1/(T - k)} \sim F_{f,T-k} \qquad (3)$$

where

f refers to the number of observations excluded,

T is the number of observations in the fitted period,

k is the number of explanatory variables.

The full set of test statistics calculated for equations (2a) and (2b) are reported in Table 3 and confirm the stability of the model. In particular, there is no evidence of a significant difference between the coefficients for any sub-period and those of the rest of the sample.

The second method of analysis is then to compare the Democratic vote share predicted by our two equations to the actual (historical) values. The results appear in Table 4.

The overall performance of the model can, however, first be summarized by appeal to the RMSPE (Root Mean Squared Percentage Error) criterion; respective values of which are 7.32% and 7.79% for equations (2a) and (2b). Atesoglu and Congleton (1982), in noting "relatively good" post-sample predictive ability of the original Kramer equations, obtain out-of-sample values for the RMSPE that vary from 4.90% to 30.37% depending on the specific time period and equation considered. While the extended post-sample predictions considered by Atesoglu and Congleton are distinct

from the election-by-election predictions considered here, this does nevertheless suggest that the present results for presidential elections may be considered as having acceptable predictive power.

This viewpoint is supported in examination of the results for the individual elections, with the errors themselves all within two estimated standard errors of zero. Although the winner fails to be correctly identified in three cases under equation (2a) and four under equation (2b), in each of the elections in question -- 1952, 1960, 1968 and 1976 -- the victor obtained less than 52.5% of the two party vote. Indeed, the 1960 and 1968 elections were won with less than 50.5% of the vote, and the failure to forecast the outcome of these particularly close elections may be set against the relatively small size of the residual errors throughout the full sample. In the most recent case of 1984, for example, there is an error of only -.005 for equation (2a) and a zero error for equation (2b).

4. Conclusion

The consistently small predictive errors associated with the model in fact provide strong evidence that Kramer's approach possesses systematic explanatory power. When combined with the favorable outcome of the Chow test that was applied, the results do indeed suggest a strong link between economic conditions and electoral outcomes. This appears to be the case with or without the presidential incumbency dummy, despite the limited reduction in the predictive error provided by its inclusion. While the relative simplicity of the specifications adopted here is not intended to imply the non-existence of more complex factors influencing voters, this

very parsimony suffices to flatly contradict Stigler's assertion that "voters disregard average income experience in deciding between parties" (Stigler, 1973, p. 166).

Footnotes

1. See the Bobbs-Merrill reprint (PS-498).
2. A representative bibliographical listing may be found in Ragsdale (1983).
3. Although see the comments by Okun (1973).
4. Kramer's own examination of such elections had been limited to the instance where the coefficient estimates were constrained to be the same as in the congressional case. Lepper (1974) found this constraint to be rejected by the data.
5. With an improvement in economic conditions adding to the voting share where it takes place under a Democratic administration, and detracting from it where it ensues under a Republican one. (Effect achieved through multiplication by the incumbency variable, I, in the specification.)
6. Although, since the quarterly series are available only from 1948, for earlier years the data for the growth rate over the full one year period continues to be used -- following Fair (1978).
7. The regressions with T1 and T2 are limited to a sample of 1916-1980 due to data unavailability for the succeeding period. All other regressions are over the full 1916-1984 sample.
8. The incumbency dummy employed here differs slightly from that used by Kramer, which is defined as (1,-1) regardless of whether the incumbent president is personally standing for re-election. However, for the presidential election case, the personal incumbency dummy defined above provides the greater contribution to the goodness of fit.

9. The Chow test is discussed in Johnston (1984, p. 220).

10. Although three elections amount to only a small set of excluded observations, this number is not exceeded due to the fact that it already comprises 20% of the remaining sample.

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TABLE 1

INDIVIDUAL RESULTS FOR EACH ECONOMIC VARIABLE

Dependent variable VOTE
Sample period 1916-1984

Regression with:	Constant	Incumbency Dummy	Economic Variable	$\bar{R}^2$	DW
G1	0.467	0.007	0.010	0.62	1.91
	(0.012)	(0.016)	(0.002)		
G2	0.472	0.006	0.009	0.51	2.49
	(0.014)	(0.019)	(0.003)		
G4	0.468	0.013	0.009	0.60	1.89
	(0.012)	(0.016)	(0.002)		
P1	0.490	0.047	-0.001	0.14	2.06
	(0.019)	(0.022)	(0.003)		
P2	0.493	0.052	-0.003	0.17	2.07
	(0.018)	(0.023)	(0.003)		
P4	0.484	0.040	0.001	0.14	1.94
	(0.018)	(0.021)	(0.003)		
U1	0.472	0.040	-0.019	0.58	1.96
	(0.013)	(0.014)	(0.005)		
U2	0.469	0.043	-0.011	0.51	2.40
	(0.014)	(0.015)	(0.003)		
AF1	0.485	0.040	0.023	0.18	2.00
	(0.017)	(0.020)	(0.025)		
AF2	0.485	0.041	0.006	0.16	2.01
	(0.017)	(0.020)	(0.009)		
S1	0.487	0.043	-0.001	0.13	2.01
	(0.018)	(0.021)	(0.012)		
S2	0.488	0.044	-0.003	0.14	2.07
	(0.018)	(0.020)	(0.009)		
T1	0.489	0.041	-0.003	0.08	1.96
	(0.018)	(0.022)	(0.009)		
T2	0.489	0.040	-0.001	0.08	1.97
	(0.018)	(0.022)	(0.007)		
WAR	0.487	0.050	-0.023	0.16	2.06
	(0.017)	(0.022)	(0.030)		

(standard errors are in parentheses)

TABLE 2

RESULTS FOR REAL GNP GROWTH IN YEAR OF THE ELECTION (G1)
TOGETHER WITH A SECOND ECONOMIC VARIABLE

Dependent variable VOTE
Sample period 1916-1984

	Constant	Incumbency Variable	G1	Second Economic Variable	$\bar{R}^2$	DW
Regression with:						
G2	0.467 (0.013)	0.006 (0.017)	0.009 (0.004)	0.001 (0.005)	0.60	1.96
G4	0.467 (0.013)	0.007 (0.016)	0.008 (0.008)	0.001 (0.008)	0.60	1.89
P1	0.475 (0.012)	0.015 (0.015)	0.011 (0.002)	-0.004 (0.002)	0.69	2.20
P2	0.477 (0.011)	0.020 (0.014)	0.011 (0.002)	-0.005 (0.002)	0.73	2.32
P4	0.470 (0.012)	0.008 (0.015)	0.011 (0.002)	-0.003 (0.002)	0.65	2.22
U1	0.467 (0.013)	0.014 (0.023)	0.007 (0.005)	-0.005 (0.011)	0.60	1.88
U2	0.466 (0.013)	0.011 (0.021)	0.008 (0.004)	-0.002 (0.005)	0.60	1.96
AF1	0.467 (0.012)	0.006 (0.016)	0.009 (0.002)	0.008 (0.018)	0.60	1.98
AF2	0.467 (0.013)	0.007 (0.016)	0.010 (0.002)	0.001 (0.006)	0.60	1.94
S1	0.469 (0.013)	0.008 (0.016)	0.010 (0.002)	-0.005 (0.008)	0.61	2.06
S2	0.469 (0.013)	0.008 (0.016)	0.010 (0.002)	-0.003 (0.006)	0.60	1.98
T1	0.465 (0.013)	0.009 (0.016)	0.010 (0.002)	-0.007 (0.006)	0.61	1.69
T2	0.466 (0.013)	0.007 (0.016)	0.011 (0.002)	-0.007 (0.005)	0.62	1.80
WAR	0.467 (0.011)	0.015 (0.015)	0.010 (0.002)	-0.035 (0.019)	0.68	2.11

(standard errors are in parentheses)

TABLE 3

RESULTS OF A CHOW TEST FOR
STABILITY OVER THE SAMPLE PERIOD

Observations Excluded	Chow Test Statistics	
	Equation (2a)	Equation(2b)
1916 - 1924	0.10	0.14
1920 - 1928	0.77	0.75
1924 - 1932	3.17	0.75
1928 - 1936	2.94	0.58
1932 - 1940	1.49	0.03
1936 - 1944	0.35	0.02
1940 - 1948	0.44	0.45
1944 - 1952	0.86	1.03
1948 - 1956	1.10	1.51
1952 - 1960	1.07	1.41
1956 - 1964	2.33	3.30
1960 - 1968	2.10	2.95
1964 - 1972	1.91	2.65
1968 - 1976	1.87	1.65
1972 - 1980	1.84	1.64
1976 - 1984	1.93	1.50

Critical values: $F^3_{12} = 3.49$ $F^3_{13} = 3.41$

(0.05 level of significance)

TABLE 4

ACTUAL AND PREDICTED DEMOCRATIC SHARE OF THE
TWO-PARTY VOTE IN PRESIDENTIAL ELECTIONS, 1916-1984

Election Year	t	Party in Power Before Election	Vote	Equation (2a)		Equation (2b)		G1	P2
				Prediction	Error	Prediction	Error		
1916	1	D (Wilson)*	.517	.541	.024	.534	.017	7.9	8.5
1920	2	D (Wilson)	.361	.354	-.007	.361	.000	-4.4	14.9
1924	3	R (Harding-Coolidge)*	.457	.465	.008	.480	.023	-0.2	1.1
1928	4	R (Coolidge)	.412	.469	.057	.465	.053	0.6	-0.2
1932	5	R (Hoover)*	.591	.561	-.030	.600	.009	-13.8	-9.6
1936	6	D (Roosevelt)*	.625	.641	.016	.632	.007	13.7	1.3
1940	7	D (Roosevelt)*	.550	.577	.027	.561	.011	7.6	0.7
1944	8	D (Roosevelt)*	.538	.556	.018	.543	.005	7.1	3.9
1948	9	D (Roosevelt-Truman)*	.524	.490	-.034	.481	-.043	4.1	10.4
1952	10	D (Truman)	.446	.497	.051	.501	.055	3.7	4.1
1956	11	R (Eisenhower)*	.422	.447	.025	.459	.037	2.1	2.7
1960	12	R (Eisenhower)	.501	.464	-.037	.456	-.045	2.1	2.0
1964	13	D (Kennedy-Johnson)*	.613	.548	-.065	.531	-.082	5.3	1.5
1968	14	D (Johnson)	.496	.509	.013	.513	.017	4.6	3.8
1972	15	R (Nixon)*	.382	.418	.036	.423	.041	5.7	4.7
1976	16	R (Nixon-Ford)*	.511	.438	-.073	.441	-.070	5.2	7.6
1980	17	D (Carter)*	.447	.447	.000	.432	-.015	-0.3	9.3
1984	18	R (Reagan)*	.408	.403	-.005	.408	.000	6.8	4.1

* denotes an incumbent president himself standing for re-election.

G1 is the growth rate of real GNP in the year of election t, and
P2 is the growth rate of the GNP deflator over the two years before election t.

Sources of Data

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