The Effect of Aggregate Economic Variables on Congressional Elections

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by

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The Effect of Aggregate Economic Variables on Congressional Elections*

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Public officials, many academic experts, and the press consider aggregate economic conditions to be important determinants of election outcomes. Low unemployment and a low rate of inflation are sometimes said to favor incumbents, and high rates of inflation and unemployment to favor challengers. Others suggest that high or rising unemployment favors the Democrats while high or rising inflation favors the Republicans. Attempts to test these propositions, in one or another form, can be found in social science journals for the past forty years.1

The importance placed on aggregate economic variables by politicians and their advisers is well known. The chances of victory for Richard Nixon in 1972 are said to have increased greatly following the wage and price freeze and effective devaluation of the dollar in August 1971. At least one former chairman of the Council of Economic Advisers accepts the view that aggregate economic performance has an important influence on voting decisions.2 There seems little reason to doubt that policy makers attempt to achieve particular levels or ranges for economic aggregates to win votes, even if the post-election consequences are unfavorable. Less certain is the effectiveness of these measures in congressional elections.

Several problems prevent acceptance of the argument and the evidence. Prior to Kramer's study, much of the work was done within a loose and rather ad hoc framework that leaves doubt about the proposition tested.3 Kramer places his study within the context of a model of rational behavior, but as Stigler has shown, the evidence he presents depends very much on the choice of time periods.4 Moreover, Kramer's study shows, at most, that rising real income benefits incumbents. "With real income held constant, changes in unemployment or in the rate of inflation have no significant independent effects."5 A careful study of British opinion polls shows significant but variable influence of inflation and unemployment on voters' opinions of the popularity of the parties.6 Less clear is whether parties are able to translate sentiment into votes.

There are two main problems with the argument that the choices made by rational voters are significantly influenced by the current position of aggregate economic variables. One is that a voter's opportunity set includes more than a choice between rival candidates. He can—and many voters do—choose not to vote. Even casual examination of voting statistics suggests that changes in the participation rate of eligible voters often is larger than changes in the share of votes received by the major parties. Is it less rational for a voter to abstain than to shift party loyalty? Two, any set of economic policies gives rise to expectations about future consequences. Recent experience reminds us that government economic policies have such long-term consequences. Do voters ignore the prospect that the policies that increase employment just before the election may increase inflation after the election? Are voters aware that action to reduce inflation before the election may reduce employment after the election? Do opposition candidates fail to make this point?

* We are indebted to Jay Kadane and Timothy McGuire for helpful comments, to Gerald Kramer for finding errors in our data, and to the National Science Foundation for financial support. An earlier version was presented at the 1973 meeting of the American Political Science Association.


2 Arthur M. Okun, “Comments on Stigler's Paper,” American Economic Review, 63 (May 1973), 172-177. In fact, our interest in the subject started in 1970 after a discussion one of us had with Herbert Stein, then a member of the Council of Economic Advisers. Stein argued that the outcome of the 1972 election would depend on the ability of the administration to lower inflation and aggregate unemployment to a specific range. A different view is expressed by former Chairman Paul W. McCracken in “The Practice of Political Economy,” American Economic Review, 63 (May, 1973), 168-171.


4 Stigler.


This paper combines two approaches. One is the framework provided by rational decision making; the other is the classification of voters according to degree of partisanship found useful in the work of the Survey Research Center. In the following section, we present a model of voting behavior in which members of the electorate decide whether to vote and for whom to vote. The model permits estimation of (1) the effect of changes in participation rate following the enfranchisement of women, (2) the effect of party realignment in the 1932 election, and (3) the independent effect of presidential elections on congressional elections. A discussion of the results and a conclusion complete the paper.

A Model of Voting

Discussions of voting often emphasize the motivations that lead people to vote, to abstain, or to vote for the candidate of a particular party. Attitudinal and other psychological variables receive main emphasis, but family and group pressures are also considered important. Campbell and Flanigan offer excellent discussions of these relationships. An implication of their work is that it is helpful to classify voters as strong or weak partisans or as independents.

Recent studies of political behavior have attempted to use the notion of rational decision making as an organizing device. Applied to voting decisions, rational decision making is said to induce voting whenever expected utility is positive. Riker and Ordeshook summarized this position in a decision rule which can be written:

\[ R = PB - C + D. \]


*See Riker and Ordeshook.*

\[ R \] is the expected utility of voting minus the expected utility of abstaining; \( PB \) is the difference in utility resulting from the victory of a particular candidate multiplied by the probability that the individual, by voting, causes a benefit. \( B, C \) is the cost of voting—the loss of utility from using resources to vote. \( D \) includes other factors affecting utility, including the attitudinal and psychological variables emphasized by Lazarsfeld and Campbell, and the citizen's sense of duty.

In this section, we consider the voter's decision as a two-step process, a decision to vote and a decision about the preferred candidate or party. The two decisions have common elements as well as differences, and they may be taken simultaneously or separately. We assume that both decisions depend on the costs and expected benefits summarized in equation (1) above.

The Decision to Vote. A citizen votes if the benefits exceed the costs. The principal cost of voting is a cost of acquiring information about parties, candidates and issues. The cost varies with the voter's commitment to a party or candidate. A strict partisan votes for the party candidates, votes regularly and gains utility from participation, from the affirmation of partisanship, and in some cases from a job or contract. Neither issues nor other factors affect a partisan voter's decision to vote or his choice of party. Perceived benefits—particularly \( B \) in equation (1)—dominate other factors, so benefits always exceed costs for members of this group. Included here are party officials, their friends and relatives, and any groups that tradition places firmly in one of the two major parties.

We assume that the fraction of the electorate that is "strict partisan" changes very little from one election to the next. Only major changes in cost or perceived benefits change the participation rate or party allegiance. The literature discusses two types of major changes during the years 1896 to 1970 included in our study.

One is the extension of suffrage to women in 1920. Prior to 1920, the calculation of net benefits is meaningless for women; after 1920, the same or similar factors affect women and men, although not always in the same way.

A second type of major change is a "realign-
Voter participation in congressional elections increases in years of presidential elections but is never as high as the participation rate in the presidential election itself. A citizen's "sense of duty" may be greater when a president is elected. Also, the incremental cost of voting for a congressman is much lower once the voter decides to vote for president. The cost of forming an opinion about the merits of presidential candidates, however, is much lower than the cost of acquiring information about congressional candidates. The press, radio, television, the political parties and other groups are so much more active in the years of presidential elections that it is difficult to avoid exposure to information or partisan statements.

A second effect of presidential elections on voting for Congress is the effect of incumbency. Congressmen who are members of the President's party are more likely to support the President on partisan issues than members of the opposition. Presidential incumbency provides information about policies of congressional candidates, lowers the cost of voting and changes the expected net benefit of voting for Congress.

We use $N_t$ to denote the percentage of voters induced to vote by the reduction in cost or increase in perceived benefits resulting from presidential elections and incumbency.

$$N_{1t} = V_t PR_t + \Delta V_t RI_t PR_t + \varepsilon_{1t},$$

where

$$PR_t = 1 \text{ if } t \text{ is a presidential election year,}$$

$$RI_t = 1 \text{ if the incumbent is a Republican,}$$

and both are zero otherwise. An error term is included to allow for the effect of random factors affecting the proportion of the electorate in $N_t$. None of the voters we have discussed is affected by aggregate economic variables or other specific issues. Some voters may be induced to vote because (1) they perceive a difference between candidates or parties on a particular issue, (2) they wish to protest against a particular policy or outcome, or (3) they wish to reward a party or candidate for a policy or outcome and encourage continuance. In each of these cases, the net benefit of voting and the probability of obtaining the benefit, $PB_t$, increase during the elections in which the issue arises.

The particular issue that concerns us is the effect of aggregate economic policies. To study the effect of these policies on an individual voter or a group, we have to distinguish between real and nominal income and to hold constant changes in real income. Nominal income is the value of income at current prices; changes in nominal income include all changes in prices. Measures of real income attempt to separate price changes from the quantity of goods and services received and to measure only the latter. Much of the reported unemployment in the United States is of short duration and arises because individuals voluntarily quit their jobs. It seems reasonable to expect voters to distinguish also between the prospect of being "laid off" as a result of government policies and changes in quit rates resulting from changes in the age composition of the population or other similar variables. It is reasonable also to expect voters to distinguish between "high" or "low" unemployment and rising or falling unemployment. Rising unemployment is likely to be accompanied by falling real income and reduced hours of work; high unemployment has no similar consequence for the bulk of the labor force or for voters. Quite apart from his social view, a voter is expected to be affected differently by the prospect of his own "lay-off" than by the unemployment of other members of the labor force.

Qualifications must also be made about the effects of inflation. Rational voters are concerned with their real income and real wealth, so their response to inflation depends on whether their incomes and purchasing power rise or fall with the price level. Inflation transfers wealth from
creditors to debtors, and deflation induces the opposite flow. Within the private sector of the economy, private debtors gain what private creditors lose; there is redistribution but no net gain or loss. The principal net debtor in the U.S. is the U.S. government and its agencies, so the net effect of unanticipated inflation on the distribution of wealth is a transfer from the public to the government. Unanticipated inflation is a tax on creditors, in this case citizens or voters who are the government's creditors, for the benefit of debtors, including the government. The effect on voters should be similar to the effect of a tax with similar consequences for the distribution of income.14

To summarize, finding the effect of inflation, deflation or unemployment on voting requires, at a minimum, that we hold real income, or in an expanding economy the growth rate of real income, constant and that we analyze the effects of changes in the rate of inflation and the unemployment rate. Let \( N_t \) denote the proportion of voters for whom the net benefit of voting is a function of aggregate economic performance.

\[
N_{2t} = a_1 p_t + a_2 U_t + a_3 \frac{C}{p} + \epsilon_{2t},
\]

where \( p_t, U_t, \frac{C}{p} \) are percentage changes in consumer prices, the unemployment rate and real compensation per man-hour. The Appendix gives additional description of the variables and their measurement.

There are, finally, other election issues local as well as national. We postulate that such issues are randomly distributed over time, so we include them in the error term of equation (2) as \( \epsilon_t.15 \)

Our hypothesis is that the percentage of eligible voters participating in a congressional election, \( VP_t \), is the sum of the components we have specified. Collecting terms in equation (2) gives the result

\[
VP_t = H_t + N_{1t} + N_{2t} + \epsilon_t
\]

\[
= V_0 + \Delta V_{1t} X_{20} + \Delta V_{2t} X_{32} + V_{1t} P_{1t} + \Delta V_{1t} R_{1t} + P_{1t} R_{1t} + aE_t + \epsilon_t,
\]

where \( aE_t = a_1 p_t + a_2 U_t + a_3 \frac{C}{p} + \epsilon_{2t}, \)

and

\[
\epsilon_t = \sum_{i=1}^{4} \epsilon_{it}.
\]

The Choice of Party Candidate. The framework developed to analyze the decision to vote is applicable, with little change, to the choice of candidates in congressional elections. Denote by \( D_t \) and \( R_t \) the percentage of the total vote for candidates of the Democratic and Republican parties so that

\[
D_t: VP_t = VD_t,\]

and similarly for Republicans and third party voters (\( VT_t \)). Summing, we have

\[
VP_t = VD_t + VR_t + VT_t
\]

In this section, we obtain the share of the vote for the Democratic candidate by distributing each of the components of \( VP \) introduced in the previous section. The Republican share is the exact analogue. The third party vote is treated as a residual.18

The first two components of \( VP \) are strict party regulars, \( H_t \) and participants in presidential (but not congressional) elections, \( N_t \). The Democrats' share of these votes is the fraction \( \alpha D H_t + \beta D N_t \).

 Voters concerned with the performance of the economy, \( N_{1t} \), are permitted not only to respond to aggregate economic variables but to respond in a partisan way. We allow our measures of unemployment or inflation to be given a more or less favorable interpretation depending on the party holding power. Democrats obtain a fraction, \( \gamma D \), of \( N_t \) that varies with incumbency,

\[
(\gamma D + \Delta \gamma D R t) N_t
\]

If voters in \( N_{2t} \) are nonpartisan, \( \Delta \gamma D R_t \) has no systematic effect on the Democrats' share. The fourth set of factors includes local issues and personalities and is assumed to be independent of

14 Our definition differs from Kramer's, "Short-term Fluctuations," p. 136. He treats all minor party votes as votes against the incumbent on grounds that short-term fluctuations in voting express satisfaction and dissatisfaction with the performance of the incumbent. We believe this overstates the extent of change in public attitudes when there are changes in the party holding the presidency by shifting the average third party vote from one major party to the other.
aggregate economic variables and our measures of incumbency.

Combining terms yields an hypothesis for the Democratic vote

\begin{equation}
VD_t = d_0 + \Delta d_0 X20 + \Delta d_2 X32 + \delta_1 PR_t + \Delta \delta_1 PR_t R_t + \delta_2 \hat{P}_t + \Delta \delta_2 \hat{P}_t R_t + \Delta \delta_3 \hat{U}_t R_t + \Delta \delta_4 \hat{U}_t R_t + \delta_5 \hat{C}/P + \epsilon_{it},
\end{equation}

and a similar equation for the Republican vote.

Estimates and Implications

Our model differs from most previous studies of the effect of aggregate economic variables by permitting the voter to abstain. It is a peculiar notion of rational behavior, in the sense of equation (1), that requires a voter to believe that the opposition candidates can manage the economy better than the incumbents. If our hypothesis is correct, a main effect of aggregate economic variables is to change the participation rate.

Table 1 shows least squares estimates of the parameters of $VP$, $VD$ and $VR$ using data for congressional elections from 1896 to 1970. The 1912 election is omitted to avoid the effects of the Roosevelt-Taft split.

Three main implications of our findings deserve emphasis. (1) There is an identifiable, stable, partisan vote. This proposition, useful in analyzing survey data, is supported by our analysis of voting decisions. The magnitudes estimated from the election statistics, however, differ from the results shown in surveys. (2) There is a "coattails" effect. An incumbent president increases his party's vote. A Republican incumbent brings the two parties, on average, near to equality in presidential election years. (3) We find little evidence that incumbent presidents can increase support for candidates of their own party by reducing unemployment or increasing the growth of real income. In the remainder of this section, we discuss our findings in greater detail.

\begin{table}
\begin{center}
\begin{tabular}{lrrr}
 & $VP$ & $VD$ & $VR$
\hline\
Constant & 47.64 & 21.42 & 22.30 \\
 & (23.72)* & (16.97)* & (22.38)* \\
$X20$ & $-16.39$ & $-7.05$ & $-4.51$
 & (6.13)* & (4.08)* & (3.30)* \\
$X32$ & $11.39$ & 8.67 & 1.58 \\
 & (4.60)* & (5.37)* & (1.24) \\
$PR$ & 11.78 & 6.81 & 5.35 \\
 & (5.48)* & (4.93)* & (4.90)* \\
$RIPR$ & 0.76 & $-2.12$ & 2.68 \\
 & (.26) & (1.02) & (1.64) \\
$\hat{p}$ & $-0.23$ & $-0.52$ & $-0.03$
 & (1.11) & (3.05)* & (0.21) \\
$\hat{U}$ & 0.01 & $-0.01$ & 0.01 \\
 & (0.79) & (0.56) & (0.46) \\
$\hat{C}/P$ & 0.11 & $-0.00$ & 0.04 \\
 & (0.34) & (0.18) & (0.19) \\
$RI \hat{p}$ & 0.62 & 0.38 & \\
 & (2.07)* & (1.63) \\
$RI \hat{U}$ & 0.02 & $-0.02$ & \\
 & (0.78) & (0.85) \\
$RI \hat{C}/P$ & $-0.09$ & $-0.07$ & \\
 & (0.19) & (0.21) \\
$R$ & 0.71 & 0.67 & 0.68 \\
 & (0.56) & (0.56) & (0.56) \\
Durbin-Watson & .68 & 1.35 & 1.11 \\
\hline
\end{tabular}
\end{center}
\caption{Parameter Estimates of Voting Participation ($VP$), Democratic ($VD$) and Republican ($VR$) Shares in Congressional Elections ($t$-statistics in parentheses)}
\end{table}

The disturbances in the $VD$ and $VR$ equations are linear combinations of the four components of the error term in $VP$. Use of ordinary least-squares to estimate the coefficients of the $VD$ and $VR$ equations yields unbiased estimates that are not asymptotically efficient as the generalized least-squares estimators of Zellner.

Democrats have a slight advantage in nonpresidential years; 23 per cent of the strict partisans vote for the Democratic candidate, and 19 per cent now vote for the Republican candidate. Less than 1 per cent are third-party partisans.

Presidential elections with a Democratic incumbent add 11.7 per cent on average, and increase the Democrats' vote to 29.8 per cent compared to 24.7 per cent for the Republicans. A Republican incumbent appears to have little additional effect on the overall participation rate, but there is a redistribution of votes from Democrats to Republicans. The average Democrat percentage falls to approximate equality with the Republican percentage.

Our findings show that the Democrats generally have an advantage over the Republicans, but the advantage is less than is suggested by differences in the political identification of the electorate obtained from surveys. Surveys classify approximately 19 per cent of the electorate as "strong Democrats" and no more than 14 per cent as "strong Republicans" in presidential years.18 If we ignore the effect of presidential elections (PR) or incumbency (RIPR) in Table 1, our estimate of the Democrats' share is four percentage points above the survey data, and our estimate of the Republican share is more than five percentage points higher than shown in the surveys. If we include the effect of presidential elections and incumbency, because the survey data are for presidential elections, both Democrats and Republicans can depend on even larger percentages than shown in the surveys. The Republican percentage rises above the sum of "strong" and "weak" Republicans shown by the surveys, but the Democrats percentage (28 per cent to 30 per cent) remains far below the total for "strong" and "weak" Democrats (40 per cent to 45 per cent) shown in the surveys. There appears to be no way to reconcile the survey data with our estimates of partisan voting.

The long-term partisan share is relatively stable. This is shown by the coefficients of variation of $V_0$, $d_i$, and $r_n$, all less than 6 per cent. Partisan behavior now appears to be less intense than in the past, however. Including women in the electorate in 1920 reduced the partisan vote for both parties and increased the variability of our estimates. "Realignment" in 1932 added to the partisan vote and increased variability further.

Our results suggest that "realignment" is an inappropriate term for the shift in voter sentiment in 1932. Although the Democrats gained more than the Republicans and became the dominant party, the gain did not come from dissatisfied Republicans switching parties. All of the Democrats' net gain, as shown by the coefficient of $X32$, is from nonaligned to Democratic and appears as an increase in the participation rate. The partisan Republican vote increased by 1.6 per cent. The increase is not statistically significant but is close to the reduction implied by $VP - VD$.

We, therefore, inclined to accept the estimate as meaningful.

Incumbency. Presidential elections increase the participation rate by about 12 per cent, on average, regardless of the party in power. Republican voters are slightly less affected than Democrats by a Democrat incumbent and their participation rate is less variable. An incumbent Democratic president increases the Democrats chances of controlling the House; an incumbent Republican president leaves the two parties with almost equal shares of the partisan vote for Congress.

The principal effect of a Democratic incumbent is to increase the number of weak partisans who vote. Both the Democratic and Republican vote increases. The Democratic share rises by more than the Republican share, so the absolute difference increases. However, the relative advantage of the Democrats declines. The Republicans benefit, slightly and in a relative way, from the increased participation in presidential elections, even if the incumbent is a Democrat. A Republican incumbent brings out approximately the same percentage of the total vote, but more Republicans and fewer Democrats vote, on the average. The coattails of Republicans appear to be longer; a Republican incumbent increases the Republican share of the vote by more than a Democrat incumbent increases the Democrat share. Several of these effects are not significant, however, at the 5 per cent level.

The Effects of Aggregate Economic Variables. The very small effect of the growth of real compensation is on participation, and not on the share of the vote received by either party. If voter dissatisfaction rises when real income or its growth rate decline, neither party gains or loses any significant percentage of the vote. Our attempts to find an effect of incumbency showed no evidence of a shift from Republicans to Democrats as real compensation changes. The estimated effects are tiny, and they are not significant by the usual test.

Changes in the unemployment percentage have little systematic effect on the participation rate or on party strength. Our results suggest that each party gains or loses from rising or falling unemployment rates when the other holds office, but the effects are small and far from significant. Some voters may believe familiar slogans suggesting that the Democrats are more "concerned"

18 Flanigan, p. 42.
about employment and unemployment. The results suggest, however, that such voters are likely to be partisans, to have strong views about the two parties, and to have made their choice independently of the current unemployment rate or its rate of change.

Similar null results were obtained in several attempts to test for a significant effect of agricultural prices, stock prices, and other economic variables. These variables have no systematic effect on the participation rate or on the share of the vote going to Democrats and Republicans.

The inflation rate is the only exception to our findings that aggregate economic variables have very little effect on the outcome of congressional elections. High rates of inflation lower the participation rate, but the reduction is not significant. An increase in the inflation rate lowers the Democrats' share of the vote. The decline in the Democrats' share is estimated at half the inflation rate, and the effect is statistically significant. The Republicans are unaffected by the inflation rate.

Including the effect of incumbency changes the interpretation. If inflation rises in a presidential year with a Republican incumbent, our estimates suggest that the Democrats' share is unaffected or may rise slightly (0.62-0.52). The Republican share rises, but the change is not significant. Any effect of higher inflation is borne by the Democrats. The only effect of reducing inflation or increasing deflation, with fixed real income, is to increase the Democrats' share of the vote.

One likely, but untested explanation of this asymmetry is that most of the inflation in this century has occurred during the term of Democratic incumbents. The mean rate of inflation during the years used in our study is 2 per cent; during years of Republican presidents, the mean rate is close to zero. Rising inflation during several years of a Republican administration is a recent phenomenon that provides a test of the partisan effect. Our findings for real compensation and unemployment—where substantial differences in mean rates of change are also observed in Democratic and Republican years—suggest that neither party will benefit. Our findings for inflation suggest that the Republicans should have gained in the non-presidential year 1974 from their failure to control inflation. The relatively large loss of seats suggests that the asymmetric effect of inflation in the past may be attributed to the low rate of inflation in Republican years.

There are other plausible explanations. Unanticipated inflation redistributes wealth or income from creditors to debtors. The losses from unanticipated inflation fall most heavily on those who fail to anticipate inflation or fail to shift their position from net creditor to net debtor. We know that the relevant groups include those whose income is fixed by contractual agreements. Landlords, unionized workers, social security recipients are likely to be heavily represented in the group of net creditors at least during the early stages of inflation. A second plausible explanation can be constructed if these groups include many issue oriented voters who are inclined toward the Democrats in non-inflationary years. It is not difficult to construct still other plausible explanations of the asymmetry. Discriminating evidence is lacking.

Election statistics indicate that Republicans dominated the pre-1932 period while the Democrats controlled Congress in most of the years after 1932. This suggests the hypothesis that the economic events from 1929 to 1932 created a lasting change in the voting habits of nonpartisans. We have tested two additional hypotheses. One is that economic events were interpreted differently after 1932; the other is that the interpretation depends on the party of the incumbent President. We find no evidence to support either proposition.

Conclusion

Our results suggest that, with the possible exception of inflation, aggregate economic variables affect neither the participation rate in congressional elections nor the relative strengths of the two major parties. There is very little evidence that an incumbent president can affect the composition of the Congress by measures that have short-term effects on unemployment or real income.

Taken together, the findings support the hypothesis that the principal fluctuations in the percentage of the votes received in congressional elections arise from changes in the participation rate and not from shifts between parties. The percentage of voters participating in presidential years rises markedly. The Democrats gain most when the incumbent is a Democrat; the Republicans gain most when the incumbent is a Republican. Fluctuations in the participation rate have a partisan effect. The Republican share rises to equality with the Democrats share in presidential years if the incumbent is Republican.

The principal changes in the composition of the House during this century appear to reflect four main factors. Two are long-term changes, and two have short-term effects.

From 1896 to 1920, the two parties had about an equal number of partisans. The participation rate fell, and the relative position of the Republicans increased after women were permitted to vote in 1920. From 1920 to 1932, the Republicans had an advantage of three percentage points at the start of the election. The 1932 "realignment" shifted voters from "nonpartisan" to Democratic, but on balance, relatively few voters appear
to have changed party loyalty. The increase in the number of partisan Democrats shifted the balance toward the Democrats. One explanation of the shift is the growth in the number of federal employees in the 1930s and of employment in state and local government in the postwar years.

The advantage obtained from the strict partisan vote can be overcome in any election. Two factors that appear most important are presidential elections and local issues or other random factors.

One principal effect of presidential elections is to increase participation. The distribution of the increase depends on the party of the incumbent president. Our findings suggest that Democrats have a 4 per cent advantage when there is an incumbent Democrat. The Republican share increases relative to the Democrats' in presidential elections, even if the incumbent is a Democrat.

A considerable part of the variance in participation and in party share is left unexplained or, on our interpretation, assigned to local and personal characteristics of the district and candidate. These factors are strong enough to dominate the results and to make our principal finding a null result. Neither our model of rational behavior nor the evidence implies that voters respond to short-term changes in employment or real income by voting for, or against, the party in power.

**APPENDIX**

**List of Symbols, Definitions and Sources of Data**

- **$VP$** Voting turnout: 1920–1970, Statistical Abstract of the U.S., 1971; 1896–1918, computed as the fraction of the number of votes cast for Representative (Historical Statistics of the U.S.) divided by the voting age population. The voting age population, males over 21, for the years 1890, 1900, 1910 and 1920, from Statistical Abstract of the U.S. 1898, 1907, 1918 and 1928 respectively; other years by interpolation.
- **$VD$** Percentage of those eligible to register voting Democratic: 1918–1970 the product of the percentage vote cast for House Democratic candidates (Statistical Abstract of the U.S. 1971) and $VP$; 1896–1920: number of votes cast for Democratic candidates (Historical Statistics of the U.S.) divided by the voting age population estimated as for $VP$.
- **$VR$** Percentage of those eligible to register voting Republican: Same sources as for $VD$

\[
\hat{p} = 1 - \frac{P_{t-1}}{P_t}
\]

with $t-1$ defined as the year prior to the election.

Similarly for $U$ and $C/p$. 

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Note: The content is presented in a natural reading format, with all mathematical and statistical notations accurately transcribed.
Voter Response to Short-Run Economic Conditions: the Asymmetric Effect of Prosperity and Recession*

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Introduction

Economic conditions are presently receiving more attention from politicians, journalists, academicians and citizens than probably any other political issue. In light of the publicity they have received and their profound impact on the living standards of American families, it is hard to believe that these economic conditions do not influence voters' selection of candidates for public office.

Nevertheless this simple proposition, which is accepted as conventional wisdom by many politicians, has been the subject of debate among researchers during the past several years. This debate was touched off by Gerald Kramer's pioneering time-series analysis which appeared in the March, 1971 issue of this Review. Using a multivariate regression model, Kramer derived results which appear to indicate that declining real income reduces the vote for the party of the incumbent President, and rising income increases it. Soon after this, George Stigler published findings which he claimed refuted Kramer's. Most recently, Arcelus and Meltzer purport to demonstrate that economic conditions (with the possible exception of inflation) do not affect the vote. How does one resolve this conflict?

To address this question properly, it is necessary to distinguish between the effect on the vote of economic downturns and that of economic upturns. Considerable evidence suggests that the magnitude of these two effects may be quite different. For example, in an article entitled "The Asymmetry of Liking and Disliking," Nehemiah Jordan cites results from several different experiments which indicate that "a positive attitude or positive affect does not have an effect upon measured behavior oppositely equivalent to the effect of a negative attitude or negative affect." In addition, Angus Campbell et al. in The American Voter, considering the trend of the "party division of the vote," state that "changes in the party balance are induced primarily by negative rather than positive attitudes toward the party controlling the executive branch of federal government. . . . A party already in power is rewarded much less for good times than it is punished for bad times."

We believe that economic conditions play a small role in the determination of voting behavior in times of prosperity. During these times, their impact is dominated by such forces as the underlying balance of party identification and other, more salient political issues. To this extent, our argument supports the views of Arcelus and Meltzer and of Stigler.

But what about years of economic distress? Here the accumulated evidence that economic conditions do have an effect is overwhelming. To interpret this evidence we must distinguish between the effects of long-run and short-run economic conditions. The effect of short-run economic conditions is reflected by greater voter concern over the economy and less favorable evaluation of the administration's performance relative to the economy. This rising chorus of criticism, however, is not uniformly distributed across the electorate. It is most intense among the large group of persons who are directly affected by the economic downturn. Data from The American Voter indicate that during the 1957–58 recession this group contained 4 out of every 10 American voters.

* The authors gratefully acknowledge the helpful suggestions of Henry J. Aaron, Richard E. Caves, John E. Jackson, John F. Kain, and William E. McAlufle. Special thanks are due to Susan E. F. Bloom for her continual assistance throughout the development of the paper.


families and that the effect of the recession on the attitude of members of this group toward the then-current Eisenhower administration varied systematically with their party identification. \(^6\) Basically, the impact on their attitude was greatest for independents and weak party identifiers and least for respondents who strongly identified with either major party. \(^7\) The crucial link between these attitudes and voting decisions is illustrated as the authors go on to show that evaluation of the administration's economic performance affected voters' intentions for the 1958 U.S. congressional election. \(^8\)

To estimate the short-run impact of such economic downturns, it is necessary to measure the long-run underlying "expected" partisan balance, or "normal" vote. \(^9\) Both the measurement of this partisan balance and the analysis of its determinants remain subjects of debate. On the basis of the 1930s' experience, however, it appears that this underlying balance can itself be affected by major, prolonged economic distress, such as that which followed the 1929 crash. For example, The American Voter indicates that the age cohorts entering the electorate in the 1930s, following the crash, produced about 10 per cent more Democratic identifiers than the cohorts entering the electorate in the 1920s. \(^10\)

In the context of the preceding discussion we developed and tested a model which focuses on the response of voters to short-run changes in the economy. To the extent that our model is specified as a multivariate regression, and is estimated from aggregate time series data, our study is similar to those of Kramer, of Stigler, and of Arcelus and Melzer. Our approach differs from theirs, however, in several important ways: (1) We explicitly recognize the asymmetry of the impact on the vote of short-run economic conditions and demonstrate that economic downturns reduce the vote for the party of the incumbent President, while economic upturns yield no corresponding benefits. (2) We estimate the lag structure of the effect of economic downturns and demonstrate that voters react far more strongly to economic conditions the year prior to an election than they do to economic conditions prior to that. (3) We compare the effect of economic conditions on the vote for the party of the incumbent President during Republican administrations with this effect during Democratic administrations and find no significant difference. (4) We examine the range of economic downturns which affect the vote and find it to be fairly broad.

Our paper is organized as follows: An explanation of the model is followed by a discussion of aggregate national time-series estimates, focusing on the asymmetry of the economic impact, its lag structure, and its impact on each party. Next we discuss a series of sensitivity tests of the model. We then draw upon state-level time-series data to provide further support for the model. In light of all this, we discuss several conceptual and methodological problems in the Arcelus and Melzer analysis which we feel invalidate their conclusions.

The Model

The model (Figure 1) postulates that voting behavior is determined by both long- and short-run forces. The structure of the model includes a dependent variable, two independent variables, and a disturbance term.

The dependent variable, voting behavior, is represented by the Republican share of the two-party vote in U.S. House of Representatives elections. Third-party votes are not included since it is unclear whether they represent a vote against the incumbent party or a protest against the two-party system. Fortunately, during the period under study, third-party candidates received a small proportion of the vote, and changing the measure to incorporate these votes does not affect our conclusions. \(^11\)

One independent variable is the long-run influence of party identification. The balance of party identification represents a "normal" or "expected" baseline vote about which short-run forces, such as economic conditions, cause the ob-

\(\text{\* Angus Campbell, Philip E. Converse, Warren E. Miller, and Donald E. Stokes, The American Voter, p. 387.}\)

\(\text{\* Similar evidence is provided by results of Gallup Polls taken during the 1937–38 recession. Approximately 63 per cent of the respondents indicated that they had noticed a "decline in business" in their community during the past two months. Of those who noticed a decline, 58 per cent indicated that they held the current Roosevelt Administration at least partly to blame for it. The variation in response by party, however, was quite striking: only 37 per cent of the Democratic respondents held the administration at least partly to blame, whereas 89 per cent of the Republican respondents did so. George Gallup, The Gallup Poll: Public Opinion 1935–71 (New York: Random House, 1973), p. 78.}\)

\(\text{\* Angus Campbell, Philip E. Converse, Warren E. Miller, and Donald E. Stokes, The American Voter, p. 391.}\)

\(\text{\* Philip E. Converse, "The Concept of a Normal Vote" in Elections and the Political Order, Angus Campbell, Philip E. Converse, Warren E. Miller, and Donald E. Stokes (New York: John Wiley and Sons, 1966), pp. 9–39.}\)

\(\text{\* Angus Campbell, Philip E. Converse, Warren E. Miller, and Donald E. Stokes, The American Voter, Figure 7.1, p. 154.}\)

\(\text{\* In 35 of the 37 elections studied, the major two parties obtained 94 per cent or more of the total vote. Their median percentage during this period was 97 per cent. Details of the effect of including third party votes are discussed later.}\)
served vote to fluctuate. Various measures of party ID have been devised by previous researchers. Arcelus and Meltzer use dummy variables in their regression equations to represent different average party shares of the vote during different periods, a procedure which creates sharp breaks between periods and does not account for changes within periods. Kramer uses a linear time variable in some of his regressions which unfortunately assumes implicitly that party ID has followed a linear trend throughout the past century. In a recent paper, Tufte uses a moving average of results in past off-year House elections. This approach enables him to account for gradual changes in partisanship but the weights used to calculate his moving average are not based on empirical evidence.

Voter registration by party, which has been recorded by several states since the early 1920s seemed to us to be the best available measure of the balance of party ID over time. We used these data to estimate our model based on election results in U.S. House races for three states during the period for which appropriate data are available (1930–70). Registration by party, however, is available only in a limited number of states, for very limited time periods. Since most of our analysis is based on aggregate national time-series, we needed to develop a proxy for registration. This proxy was defined as a weighted moving average of the Republican share of the two-party vote in U.S. House elections. Rather than arbitrarily selecting weights, we estimated them directly from the voting and registration data for the three states used in the state-level analysis. The selection of states and estimation of these weights is explained in detail in Appendix B. Basically, the weights were defined as the coefficients of the regression of voter registration on the Republican share of the two-party vote in U.S. House elections.

We recognize that individuals, regardless of their true attitudes toward each party, may have incentives to register with the locally dominant party. We do not feel, however, that this poses a serious problem for our analysis because (1) we use aggregate statewide data, in which specific local biases are probably largely cancelled out; (2) remaining systematic biases will be picked up in the intercepts of our regressions and thus will not affect our coefficient estimates; and (3) remaining net random biases will be picked up in the disturbance terms of our regressions and thus will not bias our coefficient estimates. For an extensive analysis of registration changes over time, see James Sundquist, Dynamics of the Party System (Washington: Brookings Institution, 1973), pp. 204–233.
gression of the Republican share of the two-party registration on the Republican share of the two-party vote in each of the two preceding elections. The weights were estimated to equal 0.69 and 0.36 for each preceding election respectively. Thus, the registration proxy was defined to equal the sum of 0.69 multiplied by the Republican share of the vote in the preceding election plus 0.36 multiplied by the Republican share of the vote in the election preceding it.

As can be seen, these weights decline rapidly. In fact, estimates presented in Appendix B indicate that only the results of the two immediately preceding elections are required to predict registration.

The other independent variable in the model, economic conditions, is most comprehensively measured by changes in real income. This change in spending power affects citizens' attitudes and thus influences their voting behavior. Figure 1 illustrates that prices, wage rates, hours worked, unemployment rates and other factors all contribute to the determination of real income. Arcelus and Meltzer claim that one of these factors (inflation), may have a direct effect on the vote. This direct effect represents an interesting refinement of the basic model, but since the determinants of income are highly intercorrelated, it is very difficult to distinguish their separate impacts on the vote. Fortunately, it is unnecessary to demonstrate such direct effects to show that overall economic conditions influence the vote.

The model requires an income measure which represents the change in the "average" voter's real spending power prior to each election. Because it was judged to be the best available measure of income as perceived by the voter, the percentage change in real per capita personal income during the year preceding each election was selected for this purpose. This measure includes before-tax income from all sources accruing to private individuals. One might argue that disposable, after-tax income better represents actual spending power. Since, however, the annual percentage change rates for these two variables have a correlation coefficient of 0.97, they contain virtually the same information (based on data available for 1920-70).

Personal income is available by state since 1929 and for the nation since 1919. Since the national analysis extends back to 1896, it was necessary to find an alternative measure for the earlier years. Percentage change in real per capita gross national product was selected. Of the available measures, it correlated most highly \( r = 0.91 \) with the percentage change in personal income for the years in which these two series overlap (1920-1966).

Stigler points out that there is "no naturally correct period" before each election during which income changes are most relevant to the determination of voting behavior. Since personal income and gross national product are reported only on an annual basis back to 1896, the shortest possible time period is a year. Both Kramer and we use the change in real income during the year preceding each election under the plausible implicit assumption that voters react more strongly to more recent events. Stigler, on the other hand, chooses to average the percentage change in income during the two years preceding each election. According to him, his regressions were "surprisingly sensitive to this change of measure." Unfortunately Stigler's procedure may just illustrate that if you average an important variable (income change the year directly preceding each election) with a relatively unimportant one (income change the second year prior to each election), you may dilute the apparent importance of the first variable. Estimates discussed later suggest that this is the case; hence instead of averaging the two annual changes, Stigler should have entered them as separate independent variables and estimated their relative impacts from his data.

The model does not assume that economic conditions are the sole determinants of the vote. Other factors, such as foreign policy and candidate personalities, may play an important role. In the regression equations which follow, these factors are represented by the disturbance terms as sources of "unexplained" variation in the vote. As long as they are not correlated with income changes, their omission does not bias resulting estimates of the impact of economic conditions on the vote.\(^{18}\)

Estimation of the Model from Aggregate National Time-Series

The Effect of Income Changes. The model was specified as the following linear regression.

\[
\text{VOTE} = a + B_1(\Delta\text{INC} \cdot \text{I}) + B_2(\text{ID}) + e,
\]

where

\[
\begin{align*}
\text{VOTE} &= \text{The Republican percentage of the two-party vote.} \\
\Delta\text{INC} &= \text{The percentage change in real per capita income during the year preceding each election.} \\
\text{I} &= \text{An incumbency variable equal to 1 for}
\end{align*}
\]


\(^{17}\) Ibid.

\(^{16}\) For a general discussion of the effect of omitted variables on the estimates of regression coefficients, see Potluri Rao and Roger L. Miller, Applied Econometrics (Belmont, California: Wadsworth, 1971), pp. 60-87.
Republican presidential administrations and —1 for Democratic ones.

ID = The "expected" Republican percentage of the two-party vote due to party identification. For all national analyses, ID is measured by the registration proxy.

\( a, e = \) The intercept and disturbance terms respectively.

This equation states that the Republican share of the vote is a linear additive function of changes in income, \( \Delta \text{INC} \), and party identification, ID. To complete the specification, it is necessary to multiply \( \Delta \text{INC} \) by an incumbency dummy variable, \( I \), to account for the party of the incumbent President at the time of each election. The rationale for this dummy variable is as follows: If income declines during a Republican administration, the Republican share of the congressional vote is expected to fall. If income declines during a Democratic administration, the Democratic share should decline and the Republican share will increase accordingly.\(^{19} \) Thus, the coefficient, \( B \), of the independent variable, \( \Delta \text{INC} \cdot I \), should be positive for elections preceded by economic downturns. For reasons stated previously, however, we would not expect the coefficient to be significantly different from zero for elections preceded by increasing income. Thus the sign, magnitude, and statistical significance of this coefficient provide a basis for testing the model.

Equation 1 was estimated from aggregate national data for all congressional elections from 1896–1970 except 1912, basically the same time period used for previous studies. (The election of 1912 is deleted because of its ambiguous results arising from the large Progressive vote that year.)\(^{20} \) Results are summarized in Table 1. Separate estimates are displayed for (1) elections preceded by declining real income, (2) elections preceded by rising income, and (3) all elections during the period. Each parameter estimate is listed in the table with its corresponding \( t \)-statistic directly beneath it in parentheses.

The most striking feature of these results is the difference between elections preceded by economic downturns and those during times of relative prosperity. For economic downturns, the coefficient of the income variable, \( \Delta \text{INC} \cdot I \), is large, has the expected sign, and is statistically significant at the 0.01 level. On the other hand, during prosperous years, this coefficient is considerably smaller, has the wrong sign, and is not significant at the 0.05 level.\(^{21} \)

These results provide compelling evidence of the fact that economic conditions have a strong asymmetric impact on the congressional vote. Political parties are "punished" by the voters for economic downturns but are not "rewarded" accordingly for prosperity. Apparently, in bad times the economy becomes a salient issue, whereas in good times it diminishes in importance relative to other determinants of voting behavior. It should be noted that all estimates show a significant positive correlation between the vote and party ID, which explains why the overall \( R^2 \) is virtually identical in the two separate estimates of the equation.\(^{22} \)

The model was specified in the form of Equation 1 to provide maximum comparability with Kramer's original results and to provide a better

\[ \text{VOTE} = a + e + B \Delta \text{INC} \cdot I + C \text{ID} + \text{E} \]

\( \text{E} \) is the disturbance term.

Table 1. Regression of the Congressional Vote on Income Change and Party ID

(National, 1896 to 1970, Except 1912)

<table>
<thead>
<tr>
<th>Elections Preceded by</th>
<th>All Elections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Declining Income</td>
<td>Rising Income</td>
</tr>
<tr>
<td>(N=13)</td>
<td>(N=24)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coefficients of Income Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \Delta \text{INC} \cdot I )</td>
</tr>
<tr>
<td>(3.5*)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Party Identification [ID]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.19**</td>
</tr>
<tr>
<td>(3.6)</td>
</tr>
<tr>
<td>0.86**</td>
</tr>
<tr>
<td>(5.2)</td>
</tr>
<tr>
<td>0.61*</td>
</tr>
<tr>
<td>(4.6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intercept</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.12</td>
</tr>
<tr>
<td>(-0.7)</td>
</tr>
<tr>
<td>0.05</td>
</tr>
<tr>
<td>(0.5)</td>
</tr>
<tr>
<td>0.19**</td>
</tr>
<tr>
<td>(2.7)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>( R^2 )</th>
<th>0.60</th>
<th>0.62</th>
<th>0.45</th>
</tr>
</thead>
</table>

| \( DW \) | 1.5  | 2.0  | 1.9  |

\( ** \) Significant at .01 level, two-tail.

\( * \) Significant at .05 level, two-tail.

\( * \) All \( t \)-statistics are in parentheses below parameter estimates.

\( ^{*} \) Because VOTE is defined in terms of the two-party vote, the percentage of the vote lost or gained by Republicans exactly equals the percentage gained or lost by Democrats.

\( ^{22} \) The two major parties received only 80 per cent of the congressional vote.
understanding of the following specification (Equation 2) which is used throughout the remainder of the paper.

Equation 2. Preferred Model Specification

\[ \text{DEV} = a + B(\Delta \text{INC} \cdot I) + \epsilon, \]

where

\[ \text{DEV} = \text{The deviation of the Republican percentage of the two-party vote from its "expected" percentage due to party identification (i.e., VOTE minus ID).} \]
\[ \Delta \text{INC} = \text{The percentage change in real per capita income during the year preceding each election.} \]
\[ I = \text{An incumbency dummy variable equal to 1 for Republican presidential administrations and } -1 \text{ for Democratic ones.} \]
\[ a, \epsilon = \text{The intercept and disturbance terms respectively.} \]

Equation 2 is preferable to the original specification because it focuses more directly on the principal subject of our analysis, the relationship between short-run economic and electoral fluctuations.\(^a\)

This equation states that DEV, the deviation of the vote from its "expected" outcome, is a linear function of the change in income, \(\Delta \text{INC}\), times the incumbency variable, I, discussed previously. Expectations for the income coefficient are the same as those for the income coefficient in Equation 1. For economic downturns, it should be significantly positive, while for upturns it should not be significantly different from zero. Estimates of Equation 2 from the aggregate national time-series are listed in Table 2. They are entirely consistent with our expectations.

The present specification facilitates direct comparison of the two subsamples in terms of \(R^2\) as well as the income coefficient. This comparison further illustrates the asymmetry of the process we have been describing: for economic downturns, \(R^2\) is quite high, while for upturns it is negligible.

The Effect of Income Changes by Party. After developing the basic conclusions of the model, we examined more closely how economic fluctuations affect voting behavior by first attempting to determine whether these fluctuations affect the vote for the party of the incumbent President to the same extent for both Republican and Democratic administrations. If, for some reason, voters treat administrations of the two parties differently with respect to economic issues, this would have important implications for party strategies.

Up to this point, we have specified a single economic variable, \((\Delta \text{INC} \cdot I)\), in the model. This implicitly assumes no difference between the parties' susceptibility to economic fluctuations. The coefficients of this variable in Equations 1 and 2 represent the response of voters to income changes during both Republican and Democratic administrations. A simple test for different responses under different party administrations is provided by respecifying the model as Equation 3.

Equation 3. Income Effect by Party

\[ \text{DEV} = a + B_1(\Delta \text{INC} \cdot R) + B_2(\Delta \text{INC} \cdot D) + \epsilon, \]

where

\[ \text{DEV} = \text{The deviation of the Republican percentage of the two-party vote from its "expected" percentage as defined in Equation 1.} \]
\[ \Delta \text{INC} = \text{The percentage change in real per capita income during the year preceding each election.} \]
R, D=Republican and Democratic presidential dummy variables (R = 1, D = 0 during Republican administrations and R = 0, D = 1 during Democratic ones).

a, e= The intercept and disturbance terms respectively.

Equation 3 allows for different income coefficients during Republican administrations, $B_1$, and Democratic ones, $B_2$. For example, consider the income effect during Republican administrations. The Republican incumbency variable, R, equals 1 and the Democratic incumbency variable, D, equals 0. As a result, the model reduces to Equation 4 in which the income effect is measured only by the Republican coefficient, $B_1$.

Equation 4. Income Effect During Republican Administrations

$$DEV = a + B_1(AINC) + e$$

According to the model, during economic downturns, the Republican vote will be lower than average and $B_1$ should be positive. A similar logic applies during Democratic administrations and the model now simplifies to Equation 5.

Equation 5. Income Effect During Democratic Administrations

$$DEV = a + B_2(AINC) + e$$

In this situation, the Republican vote should correlate negatively with economic changes and $B_2$ should be negative. If both parties are equally susceptible to economic changes when they are in the White House, $B_1$ and $B_2$ should have opposite signs and equal absolute values during economic downturns. In addition, according to the present model, neither coefficient should be significantly different from zero during prosperous years.

Table 3 lists estimates of Equation 3 from the national data. Note that during economic downturns, coefficients for both parties have correct signs and are similar in magnitude. In addition, their t-statistics show that one is significant at better than .05 while the other is significant at .06. Significance in such a small sample indicates that these coefficients probably measure a robust phenomenon. On the other hand, estimates for prosperous times yield insignificant income effects regardless of the party in power. In conclusion, the data do not indicate appreciable differences between the effect of income on the vote during Republican or Democratic administrations.

Lag Structure of the Effect of Income Changes. Next we attempted to clarify the lag structure of the impact of changing income on voting behavior both to gain insights into the dynamics of

<table>
<thead>
<tr>
<th>Elections Preceded by</th>
<th>Declining Income</th>
<th>Rising Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient of Income Change, Republican President</td>
<td>$[AINC \cdot R]$</td>
<td>0.59*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.5)*</td>
</tr>
<tr>
<td>Coefficient of Income Change, Democratic President</td>
<td>$[AINC \cdot D]$</td>
<td>-0.79</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-2.1)</td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.02</td>
<td>-0.03**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-1.3)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.68</td>
<td>0.13</td>
</tr>
<tr>
<td>$DW$</td>
<td>1.6</td>
<td>2.0</td>
</tr>
</tbody>
</table>

* Significant at .05 level, two-tail.

** Significant at .01 level, two-tail.

All $t$-statistics are in parentheses below parameter estimates.

b Of the 13 elections preceded by declining income, 8 had Republican incumbent Presidents and 5 had Democratic ones. Of the 24 elections preceded by rising income, 10 had Republican incumbent Presidents and 14 had Democratic ones.

Table 3. Regression of Short-Run Deviations in the Congressional Vote on Income Change by Party of the Incumbent President

Next we attempted to clarify the lag structure of the impact of changing income on voting behavior both to gain insights into the dynamics of
\(\Delta \text{INC}(2)\) = The percentage change in real per capita income during the second year preceding each election.

\(I\) = An incumbency dummy variable equal to 1 for Republican presidential administrations and \(-1\) for Democratic ones.

\(\alpha, \epsilon\) = The intercept and disturbance terms respectively.

Table 4 lists the results of estimating Equation 7 from the national data. For elections preceded by an economic downturn, the coefficient for the income change the year directly preceding each election is quite large and highly statistically significant, whereas the coefficient for the income change the second year prior to each election is indistinguishable from zero. Thus it is easy to see how by averaging \(\Delta \text{INC}(1)\) and \(\Delta \text{INC}(2)\) together, Stigler misspecified the model, thereby underestimating the income effect and concluding that it does not exist. Whereas Kramer, by including only the income change most relevant to voter decisions, was able to detect the income effect.

### Sensitivity Tests of the Effect of Income Changes

We performed a series of tests to determine the sensitivity of our results to the particular elections included in the sample and the definitions of variables that were used. Results of these tests indicate that our findings hold for a fairly broad range of economic conditions and variable definitions.

The first test shifts the emphasis from the existence of an income effect on the vote to a consideration of the conditions under which this effect occurs. To the best of our knowledge, few people would deny that a major depression, such as that following 1929, is "bad news" for the incumbent party. Indeed, the largest number of House seats lost since the Civil War occurred in 1874 (Republicans lost 96 seats after the depression of 1873), 1894 (Democrats lost 116 seats after the depression of 1893), and 1932 (Republicans lost 101 seats as the post-1929 depression worsened). In a nonpartisan sense, we would label this the Hoover-Cleveland effect. But such massive changes are only involved in three of the elections since the Civil War. Does the electorate also respond to less drastic economic downturns?

To study this question, elections were cumulatively deleted from estimates of Equation 2 in order of greatest to least decline in real per capita income. Results of this procedure (Table 5) indicate that the model survives deletion of half the sample. In fact, the coefficient of the income effect changes by less than 12 per cent. In addition, although the \(t\)-statistic and \(R^2\) decline regularly with the deletion of each election, they consistently provide confirmation of the model. Further deletions leave too small a sample for clear interpretation of the results. Thus, the vote for the incumbent party appears to be measurably reduced by a fairly wide range of economic downturns. It should be reiterated that our sample contains only elections from 1896-1970, except 1912. Because of the absence of sufficient comparable time-series data, it was not possible to include the 1873 and 1893 depressions; their inclusion would have further reinforced our findings.

Next, a standard "jackknife" test was performed for years of declining income to determine whether any single observation had an effect on the regression coefficients that was drastically different from the effect of the others. This test consisted of systematically deleting a single election from the estimate of Equation 2 until each election had been deleted from the sample once. No election had an appreciable impact on estimates of the model. The coefficient, \(B\), varied by less than 14

<table>
<thead>
<tr>
<th>Coefficient of</th>
<th>Income Change, First Year Prior to Election</th>
<th>Income Change, Second Year Prior to Electiona</th>
<th>Intercept</th>
<th>(R^2)</th>
<th>(DW)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[\Delta \text{INC}(1) \cdot I]</td>
<td>[\Delta \text{INC}(2) \cdot I]</td>
<td>(-0.02^*)</td>
<td>0.68</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td>0.67**</td>
<td>0.08</td>
<td>0.006</td>
<td>0.12</td>
<td>2.0</td>
</tr>
</tbody>
</table>

\* Significant at .05 level, two-tail.
** Significant at .01 level, two-tail.

\(a\) All \(t\)-statistics are in parentheses below parameter estimates.

\(a\) The value of \(\Delta \text{INC}(2)\) for the 1920 election (representing the income change from 1918-1919) was calculated from the per capita GNP data. See Appendix A for data sources.
Estimation of the Model from State-Level Time-Series

To test the preceding conclusions further, the model was estimated from data for the three states (California, Pennsylvania, and New York) that were used to construct the registration proxy. These estimates were based on personal income, registration and voting data for each U.S. House election from 1930–70. Separate estimates were made for elections preceded by economic downturns and those preceded by years of prosperity. In addition, two forms of the model were estimated, corresponding to Equations 2 and 3 in the national-level analysis. One assumed that income changes affect both parties to the same extent. The other allowed this effect to vary by party. Equations 7 and 8 illustrate these two specifications.

Equation 7. State-Level Replication of Equation 2

$$DEV = a + B_1(CAL) + B_2(PENN) + B_3(AINC-I) + e$$

Equation 8. State-Level Replication of Equation 3

$$DEV = a + B_1(CAL) + B_2(PENN) + B_3(AINC-R) + B_4(AINC-D) + e$$

where

- **DEV** = The deviation of the Republican percentage of the two-party vote from its “expected” percentage arising from party identification (i.e., VOTE minus ID, where in this case, ID is calculated directly as the Republican percentage of the two-party registration).
- **AINC** = The percentage change in real per capita income during the year preceding each election.
- **I, R, D** = Presidential dummy variables (I = 1, R = 1 and D = 0 during Republican administrations; I = -1, R = 0 and D = 1 during Democratic administrations).
- **CAL, PENN** = State dummy variables (CAL = 1, PENN = 0 for California; CAL = 0, PENN = 1 for Pennsylvania; CAL = 0, PENN = 0 for New York).

$a, e =$ The intercept and disturbance terms respectively.
Table 6. Regression of Short-Run Deviations in the Congressional Vote on Income Change  
(California, Pennsylvania, New York 1930-70)

<table>
<thead>
<tr>
<th></th>
<th>Equation 7</th>
<th></th>
<th>Equation 8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Elections Preceded by</td>
<td></td>
<td>Elections Preceded by</td>
</tr>
<tr>
<td></td>
<td>Declining Income (N=21)</td>
<td>Rising Income (N=42)</td>
<td>Declining Income (N=21)</td>
</tr>
<tr>
<td>Coefficient of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income Change, All Presidents</td>
<td>[AINC-1]</td>
<td>0.76** (5.0)*</td>
<td>0.16 (1.2)</td>
</tr>
<tr>
<td>Income Change, Republican Pres.</td>
<td>[AINC-R]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income Change, Democratic Pres.</td>
<td>[AINC-D]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>California</td>
<td>[CAL]b</td>
<td>0.08** (-3.0)</td>
<td>0.08** (4.8)</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>[PENN]b</td>
<td>-0.08** (-3.1)</td>
<td>-0.07** (-4.1)</td>
</tr>
<tr>
<td>Intercept</td>
<td></td>
<td>0.02 (0.9)</td>
<td>0.03* (2.2)</td>
</tr>
<tr>
<td>$R^2$</td>
<td></td>
<td>0.79</td>
<td>0.68</td>
</tr>
<tr>
<td>$DW$</td>
<td></td>
<td>2.0</td>
<td>1.2</td>
</tr>
</tbody>
</table>

* Significant at .05 level, two-tail.
** Significant at .01 level, two-tail.
* All $t$-statistics are in parentheses below parameter estimates.

b CAL and PENN identify the state for each observation (CAL = 1, PENN = 0 for California; CAL = 0, PENN = 1 for Pennsylvania; and CAL = 0, PENN = 0 for New York).

These equations are identical to those estimated from the national data, with two exceptions. First, since party ID can be measured by state-level registration, it is unnecessary to calculate a registration proxy. Instead, registration can be used directly in defining the dependent variable (i.e., $DEV = VOTE$ minus ID). Second, it is necessary to include two dummy variables, CAL and PENN, to identify each observation by state. The coefficients, $B_1$ and $B_2$, of these two variables indicate differences between New York's intercept, $a_1$, and those for California and Pennsylvania respectively. Interpretation of the estimated income coefficients is identical to that of estimates from the national data.

The state-level results are listed in Table 6. As can be seen, the estimated income coefficients are consistent with those obtained from the national data. They are large and significant for economic downturns but small and not significantly different from zero for prosperous times. In addition, the income coefficients for economic downturns during Republican and Democratic administrations are similar to each other and remarkably similar to those obtained from the national data.\(^{28}\)

Implications for the Arcelus and Meltzer Study

Having presented our results, we now turn to the Arcelus and Meltzer study. Their findings con-
Conflict with ours in several important ways, because of conceptual and methodological problems in their analysis.

One of their most serious problems is that they overlook the difference between the impact of economic downturns and the impact of economic upturns. Their specification of the model implicitly assumes that the impacts of upturns and downturns are opposite in sign and equal in magnitude. As previously discussed, our results demonstrate the inappropriateness of this assumption.

A second important problem is Arcelus and Meltzer's use of real compensation per man hour as a measure of real income. For years, economists have recognized that wages may rise during prosperous times when income is rising but that they do not fall in a corresponding manner during economic downturns when income is declining. This downward rigidity of wages is often explained by such factors as union contracts and minimum wage laws. Figure 2 illustrates the difference between the percentage change in real compensation per man hour used by Arcelus and Meltzer and the percentage change in real per capita income (measured by personal income and GNP), for the time period used in their analysis. For example, during the Great Depression from 1931–32, real compensation per man hour declined by only 2 per cent, while real per capita income fell 16 per cent. For the set of elections in their sample, real compensation per man hour "predicted" only 41 per cent of the variation in real per capita income. Thus we feel that compensation per man hour seriously misrepresents income changes.

A third problem with the Arcelus and Meltzer study is that their model includes three separate determinants of real income changes; $p$ (price changes), $\bar{U}$ (unemployment rate changes and C/p (changes in real compensation per man hour)) as explanatory variables. Arcelus and Meltzer find that no single factor (except possibly prices) exhibits a separate impact on the vote, and they conclude from this that overall short-run economic conditions have no effect. This conclusion does not follow from their results for the following reasons.

(1) It is possible that no single real income determinant is powerful enough to influence the vote but that the entire group as a whole (or real income itself) has a pronounced effect.

(2) The linear combination of prices, unemployment, and compensation per man hour used by Arcelus and Meltzer accounts for only part of the changes in real income because (a) additional factors enter into its determination and (b) the functional form relating income changes to its determinants is non-linear. Thus even as a group, these variables do not represent a complete test of the impact of real income on the vote. To illustrate this point the percentage change in per capita real income was

---

Figure 2. Comparison of the Annual Percentage Change Rates for Real Per Capita Income and Real Compensation Per Man Hour from 1896 to 1970

- Each point represents the annual income or compensation change rate preceding the election year indicated.

---

regressed on Arcelus and Meltzer's three variables ($p$, $U$, and $C/p$). As a group, these variables "predicted" only 61 per cent of the variation in real income changes.

3 Arcelus and Meltzer's economic variables are intercorrelated with each other and with the additional explanatory variables in their model (see their Table 1). This collinearity makes it difficult (if not impossible) to ascertain the separate impact on voting behavior of each economic variable. Their model further compounds this problem by including 10 explanatory variables in regressions which are estimated from only 37 observations. To assess the extent of this problem, it is useful to determine the multiple correlation, $R$, between each of their economic variables ($p$, $U$, and $C/p$) and the remaining nine explanatory variables in their model. To do this, each economic variable was separately regressed on all nine remaining explanatory variables. The resulting multiple correlation coefficient for $p$ as a linear function of the nine variables was 0.77; that for $U$ was 0.86; and that for $C/p$ was 0.77. This collinearity causes large standard errors for their regression coefficients, which make it very difficult to obtain estimates of the separate impact of each economic variable.

Conclusions and Suggested Further Research

State and national time-series and selected cross-sectional survey data indicate that economic downturns have a pronounced effect on the vote in U.S. House elections. They support a modified, asymmetric version of Kramer's original model in which economic downturns have a pronounced effect on the vote phenomenon, in which economic downturns reduce the vote for the party of the incumbent President, but economic upturns have no corresponding effect. In addition, the data show that (1) the effect of economic downturns on the party of the incumbent President is the same for either Republican or Democratic administrations, (2) voters primarily consider economic conditions which occur the year immediately preceding each election, (3) the model holds for a fairly broad range of economic conditions, and (4) the contradictory findings of Arcelus and Meltzer and of Stigler can be explained by problems in their methodologies.

Studies to date, however, represent only a first step toward a full understanding of the role of economic issues in the political process. The following is a sampling of the many possibilities for future research in this area.

Application to Other Elective Offices. The structural relationship between economic conditions and the vote for the incumbent party may be common to a variety of elective offices. We have relied on the U.S. House vote, partly for reasons of comparability with previous studies, but also because the Senate and presidential time-series provide smaller samples. The Senate series begins in 1914 and the presidential series includes only half as many elections as the House series. In addition, we expect the effect of candidate personalities to reduce the impact of economic conditions in senatorial and presidential elections. These hypotheses, however, remain to be tested.

Finally, it should be noted that economic conditions are only one of many issues that enter into the political process and that in a broader context, a better understanding of their role is important for improving our knowledge of the role of issues in general.

APPENDIX A

Data Sources and Definitions of Variables

Aggregate National Analysis

1. Percentage of the total vote by party, U.S. House of Representatives Elections, 1896-1970: Obtained from unpublished tables provided by Prof. W. D. Burnham of MIT, which are considered to be the most recently updated figures.

See Appendix A for sources of state income data published by the Department of Commerce for 1929 to the present. For 1919-21 see: Maurice Leven, Income in the Various States, Its Sources and Distribution, 1919, 1920 and 1921 (New York: National Bureau of Economic Research, 1925). Note that the Leven data are not strictly comparable to the Department of Commerce data.

available and are quite similar to those used in the original Kramer analysis. The Republican percentage of the two-party vote was calculated as the Republican percentage of the total vote divided by the sum of the Republican and Democratic percentages of the total vote, the quotient of which was multiplied by 100.

2. **Consumer Price Index 1919-70 (1967=100):**
   

3. **Total Population 1919-70:**
   

4. **Income:**
   
   
   B. 1919-1928—Total personal income in current (nondeflated) dollars. Obtained from Series A37, p. 188, LTEG.
   
   
   D. Real per capita annual income (INC) was estimated as
   
   **For 1895-1918:**
   
   \[
   \text{INC} = \frac{\text{TPINC} \cdot 100}{\text{POP} \cdot \text{CPI}},
   \]
   
   **where**
   
   \[
   \begin{align*}
   \text{INC} &= \text{Real per capita income in 1967 dollars.} \\
   \text{TPINC} &= \text{Total current personal income.} \\
   \text{POP} &= \text{Total population.} \\
   \text{CPI} &= \text{The consumer price index (1967=100).}
   \end{align*}
   \]
   
   **E. Annual percentage change in real per capita income the year preceding each election was then obtained as**
   
   \[
   \Delta \text{INC} = \frac{\text{INC} - \text{INC}(-1)}{\text{INC}(-1)},
   \]
   
   **where**
   
   \[
   \begin{align*}
   \Delta \text{INC} &= \text{Annual percentage change in real per capita income.} \\
   \text{INC} &= \text{Real per capita income the year of each election.} \\
   \text{INC}(-1) &= \text{Real per capita income the year prior to each election.}
   \end{align*}
   \]

3. **State-Level Analysis**

   1. **Percentage of the total vote, by party, U.S. House of Representatives Elections, 1930-70:**
   
   Paul T. David, *Party Strength in the United States 1872-1970*, University Press of Virginia, Charlottesville, Va., 1972. (Cal. data on p. 103, N.Y. data on p. 213, Penn data on p. 237). The Republican percentage of the two-party vote was calculated as the Republican percentage of the total vote divided by the sum of the Republican and Democratic percentages, the quotient of which was multiplied by 100.

   2. **Voter Registration by Party:**
   
   A. California (for 1922-1960) Eugene E. Lee, *California Votes 1928-60*, Table 2-1, p. 29, (Berkeley, Calif.: Institute of Governmental Studies, 1963); (for 1962-70) *Report of Registration*, published for each general election by the California Secretary of State.
   
   B. Pennsylvania—*The Pennsylvania Manual* (Harrisburgh: Commonwealth of Pennsylvania), 1925-26 through 1970-71 volumes. Prior to 1936, registration was not required in some rural areas. Since 1936, the data are statewide totals.
   

3. **Incomes**

   
   
   
   D. Real per capita income (INC) was estimated as
   
   \[
   \text{INC} = \frac{\text{PINC} \cdot 100}{\text{CPI}},
   \]
   
   **where**
   
   \[
   \begin{align*}
   \text{INC} &= \text{Real per capita income in constant 1967 dollars.} \\
   \text{PINC} &= \text{Per capita current income.} \\
   \text{CPI} &= \text{The aggregate national consumer price index (1967=100).}
   \end{align*}
   \]
   
   Separate price indices for each
state were not available for the entire period.

E. Annual percentage change in real per capita income the year preceding each election was then obtained as

$$\Delta INC = (INC - INC(-1))/INC(-1),$$

where

- $\Delta INC$ = Annual percentage change in real per capita income.
- $INC$ = Real per capita income the year of each election.
- $INC(-1)$ = Real per capita income the year prior to each election.

**APPENDIX B**

**Estimation of the Weights for the Registration Proxy**

The registration proxy is a weighted moving average of the Republican share of the two-party vote. Its weights are defined as the coefficients ($B_1$ and $B_2$) of the linear regression (Equation B1) of the Republican share of the two-party registration ($REG$) on the Republican share of the two-party vote in each of the two preceding U.S. House elections ($VOTE(-1)$ and $VOTE(-2)$).

**Equation B1. Predicting Registration by Past Election Results**

$$REG = a + B_1(VOTE(-1)) + B_2(VOTE(-2)) + e,$$

where

- $REG$ = The Republican percentage of the two-party registration.
- $VOTE(-1), VOTE(-2)$ = The Republican percentage of the two-party vote in the first and second preceding U.S. House elections respectively.
- $B_1, B_2$ = The regression coefficients or weights of $VOTE(-1)$ and $VOTE(-2)$ respectively.
- $a, e$ = The intercept and disturbance terms respectively.

This regression was estimated for California, Pennsylvania, and New York from time-series data on election results and voter registration by party maintained by each state. States were chosen according to the following criteria:

- **Size**—Large states were needed to provide enough House districts to average out idiosyncrasies arising from such factors as specific personalities and dominant local party organizations.

**Length of Time Series**—Registration time-series by party vary by state from zero to over twenty elections. California, Pennsylvania, and New York have the longest series available, with the exception of Oregon, which has too few House districts for use in the analysis (California begins in 1922, Pennsylvania begins in 1925, New York data for consecutive elections begin in 1920, and Oregon begins in 1908).\(^{81}\)

**Variation Across States and Time**—The greater the variation in registration and voting behavior, the more generalizable are the estimates of the weights.

The analysis is summarized in Table B1. Each column in the table represents an estimate of Equation B1. The first three columns list results for each state. The coefficients, for $VOTE(-1)$ and $VOTE(-2)$ are the relative weights used to combine the variables to calculate the registration proxy. This linear combination "predicts" a large proportion of the variation in observed registration. For example, a new variable defined as $[0.71\, VOTE(-1)+0.23\, VOTE(-2)]$ "predicts" 75 per cent of the variation in California registration.\(^{80}\)

Coefficient estimates are remarkably consistent with each other. The appropriate $t$-test indicates that they do not significantly differ by state. Since we had no a priori reason for expecting them to differ, we pooled all observations into a joint sample from which Equation B1 was estimated.\(^{83}\) These pooled estimates (column 4 in Table B1) yield weights of 0.69 and 0.36 for $VOTE(-1)$ and $VOTE(-2)$ respectively. Thus the registration proxy used throughout the analysis of the national data was defined as $[0.69\, VOTE(-1)+0.36\, VOTE(-2)]$.

Table B1 also demonstrates that only the results of the past two elections are required to predict voter registration at any given point in time.\(^{84}\)

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\(^{81}\) Oregon increased from two to four House districts during this period.

\(^{80}\) The unadjusted $R^2$ for the California equation is 0.75. Because they incorporate degrees of freedom, the adjusted $R^2$'s shown in the table are underestimates of the actual proportion of the registration variation "predicted" by each regression. For further discussion of adjusted $R^2$, see J. Johnston, *Econometric Methods*, 2nd edition (New York: McGraw-Hill, 1972), pp. 129-130.

\(^{83}\) The standard errors of estimate of the regressions for each state were statistically significantly different from each other, according to the appropriate $F$-test. Thus to obtain the most efficient estimators, observations for each state in the pooled sample were weighted in inverse proportion to the standard error of the separate regression for that state.

\(^{84}\) Estimates also indicate that the weights attached to additional elections decrease rapidly as the time between the election and registration figures increases.
Table B1. Republication Share of Registration Estimated from Republican Share of Congressional Vote in Preceding Elections  
(California 1922–70, Pennsylvania 1926–70, New York 1920–70)

| Coefficients of: | California  
\((N = 25)\) | Pennsylvania  
\((N = 23)\) | New York  
\((N = 26)\) | All Three States Pooled\(^c\)  
\((N = 74)\) |
|------------------|-----------------|-----------------|-----------------|-----------------|
| Vote, 1st Election Prior to Registration  
\([\text{VOTE}(-1)]\) | 0.71** \((4.5)^a\) | 0.74** \((5.8)\) | 0.58** \((3.6)\) | 0.69** \((8.1)\) |
| Vote, 2nd Election Prior to Registration  
\([\text{VOTE}(-2)]\) | 0.23 \((1.5)\) | 0.44** \((3.5)\) | 0.49** \((3.1)\) | 0.36** \((4.2)\) |
| California \(\text{[CAL]}^b\) | \(-0.09**\) \((-5.5)\) | \(0.05**\) \((4.4)\) | \(0.05**\) \((4.4)\) | \(0.05**\) \((4.4)\) |
| Intercept | \(-0.06\) \((-0.9)\) | \(-0.05\) \((-1.0)\) | \(-0.05\) \((-0.6)\) | \(-0.03\) \((-1.0)\) |
| \(DW\) | 1.1 | 0.7 | 2.3 | 1.3 |
| Adjusted \(R^2\) | 0.73 | 0.87 | 0.63 | 0.82 |
| Adjusted \(R^2\), Past 6 Elections\(^d\) | 0.70 | 0.87 | 0.68 | 0.81 |

\(^{**}\) Coefficients and intercepts bearing "**" are significant at the .01 level, two-tail; all others do not even attain significance at the .05 level, two-tail.

\(^a\) All \(t\)-statistics are in parentheses below parameter estimates.

\(^b\) CAL and PENN identify the state for each observation (CAL = 1, PENN = 0 for California; CAL = 0, PENN = 1 for Pennsylvania and CAL = 0, PENN = 0 for New York).

\(^c\) Observations for each state are weighted in inverse proportion to the standard error of the separate regression for that state.

\(^d\) Obtained from regressing current registration on the results of each of the past 6 congressional elections.

Additional past elections increase "predictive" ability very little. Comparison of the adjusted \(R^2\) for the equations containing two prior elections with those containing six elections clearly illustrates this point. Adjusted \(R^2\) explicitly trades off the gain in "predictive" ability against the loss of degrees of freedom caused by adding explanatory variables. For some of the estimates in the table, the loss of degrees of freedom outweighs the increase in "predictive" ability. In these cases, adjusted \(R^2\) decreases when going from two to six elections.
Comment on Arcelus and Meltzer,
The Effect of Aggregate Economic Conditions on
Congressional Elections*

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Yale University

Arcelus and Meltzer begin with a quite plausible point, that short-term economic fluctuations may affect voter participation as well as partisan preference. Their empirical findings differ markedly from those of several earlier studies, and if correct would considerably change our current understanding of the effects of economic variables on elections. It seems to us, however, that upon closer examination, their major inferences are not supported by the evidence they present. There are serious problems with their model, the data they apply to, the statistical method they use to estimate it, and the way they interpret their results. We shall review some of these difficulties and show that their principal conclusions are not substantiated by their evidence, and that their results in fact show very little, one way or the other, about the effects of economic conditions on congressional elections. When some of the problems inherent in their research design are remedied, reanalysis of the model leads to quite different conclusions, which substantially (though not entirely) confirm those of the earlier studies cited above. Before presenting these results, however, we first consider some more basic matters.

Long-Term Changes in Participation

Figure 1 below shows the aggregate participation rate in congressional elections over the period 1896–1970. This is essentially the VP series used by Arcelus and Meltzer in their paper. The VR and VD series are similar. Several broad trends are apparent. Participation declined rapidly from 1896 to 1912, dropped abruptly in 1920, then rose steadily until World War II. It dropped again during the War, then in the postwar period increased steadily until the 'sixties, and has declined somewhat since then. Though the precise reasons for these secular tendencies are not completely known, it seems clear that major historical and demographic forces, rather than short-term economic or other factors, are largely responsible.

In order to properly measure the impact of short-term forces, it is necessary to control and compensate for these longer-term historical forces, which would otherwise contribute most of the variation in the series and confound the estimates of short-term effects.

The Arcelus-Meltzer model in effect controls...
Figure 1. Voter Participation Rate (House Vote/Total Eligible Vote), 1896–1970*.

- △ = Presidential year election
- ○ = Midterm election

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*Omitting 1912. Scales of midterm and presidential year elections adjusted to equate the means of the two series.
for long-term trends by incorporating two dummy variables, for the post-1920 and -1932 periods. This specification implicitly assumes that voter participation has fluctuated around relatively stable levels, with abrupt shifts to new levels in 1920 and again in 1932, as shown in Figure 1. Yet inspection of the actual participation series indicates that most of the major changes have been gradual trends, persisting over a series of elections, rather than the abrupt shifts they posit. The residuals generated by their various equations are not random (this is clear from visual inspection of the residuals, and also from the values of the Durbin-Watson statistic [a measure of the correlation between adjacent residuals] they report), as they should be if the model were correctly specified, but display systematic patterns. It seems clear that the long-term model is misspecified, and hence that the Arcelus-Meltzer estimates of the long-term partisan shares are incorrect. It is not surprising that they are unable to reconcile their estimates with survey data findings on partisanship (p. 1237).

The misspecification of the long-term part of the model may well also affect the estimates of short-term factors. Since it introduces systematic discrepancies between real and estimated long-term trends in participation, whatever genuine short-term fluctuations are present will be confounded with these spurious discrepancies. Mis specification of one part of the model can, in general, lead to biased estimates of all coefficients. It is no simple task to model explicitly the complex and changing mix of social, demographic and historical forces which underlie long-term changes in participation, and there may be no easy way to correct for these biases; it may be, in fact, that longitudinal participation data are simply too "noisy" to permit accurate measurement of short-term effects. In any event, there is a potentially serious specification problem with the Arcelus-Meltzer model, and their results (including their estimates of short-run effects) should be regarded with caution.

Why, and How, Should Economic Variables Affect Participation?

The starting point of the Arcelus-Meltzer analysis of short-term effects is their model of "rational" abstention: thus, "Our model differs from most previous studies...by permitting voters to abstain...If our hypothesis is correct, a main effect of aggregate economic variables comes by changing the participation rate." In developing these hypotheses, they suggest three ways in which economic (or other) factors may induce voters to vote: "(1) because they perceive a difference between...parties on a particular issue, (2) they wish to protest against a particular...outcome, or (3) they wish to reward a party...for a policy or outcome....In each of these cases, the net benefit of voting...increase[s] during elections in which the issue arises." Presumably the idea behind (1) is that some potential voters consider one of the parties—the Republicans, for example—best qualified to deal with a particular issue, such as inflation. Then in an election in which inflation "arises" as an issue—presumably because it is too high—these individuals will be more likely to vote. By the same reasoning this "perceived differences" hypothesis would also predict increased turnout when unemployment is high, and when the growth rate falls. These predictions are summarized in Figure 2 below. The second hypothesis, (2), leads to the same predictions: "protesters" are more likely to vote when conditions are bad, i.e., when inflation and unemployment are high, and the growth rate low. The third hypothesis, however, would predict precisely opposite effects, since "rewarders" will be more likely to vote when conditions are good. Arcelus and Meltzer offer no hypotheses about the relative strengths of these three motivations in the electo-

rate as a whole, or within any subgroup, such as partisans of either party. In the absence of such information, their theoretical hypotheses do not lead to any clear predictions about the net effects of economic conditions on participation. If "rewards" are the most numerous group, the effects of the economic variables should be of the sign in column (3); if "rewards" and others approximately offset each other, economic variables will have no net effect; while if protest and/or perceived differences are the prevalent motivations, the effects should be as in columns (1) and (2). Thus any possible set of empirical findings can be reconciled with their hypotheses: there is no conceivable way in which their evidence could possibly falsify their model of the voting process.

Where Are the Shift Voters?

Arcelus and Meltzer draw the surprising conclusion that "fluctuations in congressional elections arise... not from shifts between parties." It seems to us, however, that their results do not support this conclusion, and in fact that there is no possible way of inferring the magnitude of shifting from the type of evidence they use. Their model proceeds by partitioning the eligible electorate into three groups: (1) " Habitual, partisan voters," who constitute $N_t$ of the electorate in election $t$; (2) a group $N_1$ of "voters induced to vote by the reduction in cost or increase in perceived benefits resulting from presidential elections and incumbency"; and finally a block $N_2$ of voters "for whom the net benefit of voting is a function of aggregate economic performance."

The participation rate of this last block is assumed to be a linear function of certain macroeconomic variables. In extending this framework to a model of partisan choice, they take the partisanship of the first two groups as fixed (the Democratic shares of each block of voters being $\alpha_D$ and $\beta_D$, respectively), while that of the third group of voters, those motivated to vote because of concern for economic issues, "varies with incumbency," presumably because of differential turnout effects. Nowhere in this framework is there any provision for a block of "shift" voters, who regularly vote but switch from one party to the other in response to economic or other issues. Ignoring this possibility seems dubious empirically, for evidence from other sources indicates that such voters do exist and that they constitute a sizable portion of the active electorate. In any event, since their model makes no provision for the possibility of shift voters, it is not entirely surprising that they do not find any.

To explore this issue further, let us add to the Arcelus-Meltzer model a fourth block of voters, who always vote but shift from party to party. Let $S$ be the size of this block (as a fraction of the eligible electorate), and $\delta_r$ and $\delta_d$ be the Republican and Democratic shares, respectively, of these votes in election $t$. Since these voters always vote they will not affect total participation ($S$ will be incorporated into the intercept of the $VP$ equation), but they will affect the relative sizes of the Democratic and Republican shares. To simplify, let us suppose there is only a single relevant economic variable, $t$ (the growth in per capita real income), and that the voters in $S$ vote for or against the incumbent party according to its economic performance. Then $\delta_d$ will be given by

$$
vd_t = c_1 - c_2 t + c_3 R t + d_1 \delta_r + e_t,
$$

where $\delta_r$ is +1 or -1 according to whether the incumbent president is a Republican or Democrat, and the coefficient $c_2$ is positive if voters do indeed shift in the manner described above. Since $\delta_r = 2R_t - 1$, we can rewrite this expression in terms of the $RI$ variable, after some elementary manipulation, as

$$
vd_t = (c_1 + c_2) - 2c_2 RI_t + c_3 R_t
- 2c_2 RI_t \delta_r + e_t.
$$

If we now add this block of voters to Arcelus-Meltzer's equation (3) (still assuming only one economic variable), the Democratic vote becomes

$$
VD_t = \{ \ldots \} + d_1 S + \Delta d_1 RI_t \delta_r
+ v d_t - S + e_t
= \{ \ldots \} + \{ (c_1 + c_2) - 2c_2 S \}
- (2c_2 S) R I_t + (d_1 + c_3 S) R_t
+ \Delta d_1 - 2c_2 S) R I_t \delta_r + e_t,
$$

(where $\ldots$ is the block of terms in their expression not involving economic variables). This expression involves nearly the same set of explanatory variables as their expression (3), the sole difference being the incumbency variable $RI_t$.

The coefficient of this variable is a measure of the net advantage of incumbency, and both a priori considerations and other empirical evidence suggest this effect should be small, so that the inclusion or deletion of the $RI_t$ term should have little effect on the remaining estimates. Hence the results in their Table 1 can be interpreted in terms of this expanded model which includes switch voters.

A fundamental difficulty, however, is immediately apparent: the regression coefficient of the $t$.

\footnotetext{For example, V. O. Key, *The Responsible Electorate* (Cambridge: Belknap Harvard, 1966).}

\footnotetext{This is the specification used in Kramer, "Short-Term Fluctuations," but others would do as well.}

\footnotetext{Ibid., p. 139.}
Do Economic Factors Affect the Parties' Strengths?

On this broader question, Arcelus and Meltzer conclude that "with the possible exception of inflation, aggregate economic variables [do not] affect...the relative strengths of the two major parties. There is very little evidence that an incumbent president can affect the composition of the Congress by measures that have short-term effects on unemployment or real income."

"Neither our model...nor the evidence implies that voters respond to short-term changes in employment or real income by voting for, or against, the party in power." This "null result" is based on the fact that the estimated coefficients of most of the economic variables are not significant and display no significant differential effects on the Democratic and Republican share of the two-party vote.

In several respects the evidence seems inadequate to support these conclusions. There are serious problems with the Arcelus-Meltzer data, and in particular with the unemployment and income variables (which we will examine below). This alone could account for their nonfindings on those variables. Quite apart from that, however, Arcelus and Meltzer's analysis of their results does not take adequate account of several rather basic matters of statistical inference. For one thing, multicollinearity among the economic variables makes it difficult to disentangle their individual effects, and tends to produce large standard errors for the individual estimates. Thus even if economic variables as a block had a highly significant effect, it is possible for all of the estimated coefficients to be individually insignificant. Arcelus and Meltzer make no attempt to examine this possibility.

There is another important problem. Since the net effect of any economic variable on the parties' vote shares depends on the difference between the coefficients associated with that variable in the $VD$ and $VR$ equations, the relevant question is whether this difference is significantly different from zero, not whether the individual coefficients are.

Lack of significance means only that the range of possible error, or confidence interval, associated with the estimate is large enough to include zero. When this is so, the data are indeed consistent with the possibility that the true effect is small (or zero), but they may be equally consistent with the possibility of very large effects. If a confidence interval is small and centered about zero, so that the possible values of the coefficient consistent with the data all correspond to small effects, then one might indeed conclude from the evidence that the effect in question is absent, or negligible; but if the interval is very large (and happens to include zero), the appropriate inference is not that the variable has no effect, but rather, that the results leave a great deal of uncertainty about its possible effects.

The range of uncertainty in the Arcelus-Meltzer estimates is considerable. For example, if we consider the two estimates of the $RIC/p$ terms in their Table 1, the usual .95 confidence intervals would run from about $-1.02$ to $.84$ for the coefficient in the $VD$ equation, and from $-.72$ to $.58$ for the $VR$ equation. Thus (ignoring the nonindependence of the estimates), while these results are consistent with the null hypothesis that there is no income effect (i.e., that both coefficients are approximately zero), they are equally consistent...
with the hypothesis of very sizable effects. For example, if the true values were -.4 and +.4 respectively (both lying well within their respective confidence intervals), a 10 per cent increase in real compensation per man-hour would decrease the democratic vote by some 4 per cent of the eligible electorate, and increase the Republican vote by the same amount. In a midterm election with total participation of around 40 per cent, this represents the difference between a 50-50 election and a Republican landslide of 60 per cent—a very major effect indeed. It seems to us that the main inference to be drawn from the results in the Arcelus-Meltzer Table 1 is that they leave a great deal of uncertainty about the nature and magnitude of the possible effects of economic variables on election outcomes—they simply do not shed much light on the question one way or the other.

This inconclusiveness, however, is in part the product of several serious problems with their data and estimation method, which we shall now review.

Data and the Specification of Variables

While Arcelus and Meltzer have corrected a data error in the C/p series that we discovered in an earlier draft of their paper, we are still unable fully to replicate their results. We have carefully attempted to reconstruct their series using the sources and definitions given in their appendix, and have also used their own original data (with corrections in their C/p series). With either data set, however, we find a number of discrepancies, in some cases substantial, between our estimates and those reported in their Table 1. Some of these discrepancies may reflect errors which remain in their data.

Possible errors aside, moreover, the entire Arcelus-Meltzer analysis of the effects of economic variables is seriously weakened by their peculiar specifications of the economic variables, especially their choice of the “income” variable. Arcelus and Meltzer themselves comment that “rational voters are concerned with their real income,” and argue for the importance of including “real income, or in an expanding economy the growth rate of real income” as a variable. This is certainly plausible, since a variable like (per capita) real personal income is a measure of the average level of goods and services available for consumption, and hence reflects the average state of material well-being or prosperity in the electorate. Previous studies of the effects of macroeconomic conditions on voting have used such a variable, and have found it to be empirically important. Yet in passing from their general theoretical discussion to the particular equations they actually estimate, Arcelus and Meltzer inexpli-cably abandon real income, and change to quite a different variable, “real compensation per man-hour” (in nonagricultural establishments). The reasoning behind this change is obscure, and the compensation variable seems to us suspect in several ways. It is a measure of the average hourly wage (compensated for inflation) of those who work. Hence it ignores the unemployed: if in a recession low-wage workers are the first to be laid off, then compensation per man-hour would rise, even as the average level of prosperity in the country declined. It also takes no account of the number of hours worked: if the country were obliged to change over temporarily to a four-day work week, as Britain recently was, compensation per man-hour would be unchanged, though obviously incomes would fall. It takes no account of the agricultural sector, which was sizable in the earlier part of the sample period. All in all, compensation per man-hour seems to us a very poor measure of overall prosperity. A variable like per capita real personal income would have been a better choice.

The treatment of unemployment is likewise puzzling. They use, again without explanation, the rate of change in the unemployment rate. The rationale for this is unclear, since unemployment is already a rate (being corrected for changes in the size of the labor force), and does not show any long-term tendency to grow (unlike national income or the price level). On the Arcelus-Meltzer specification, the electorate should be equally concerned with unemployment if it increased from 5 to 6 per cent in the year of the election, or from 5 to .6 per cent, or from 50 to 60 per cent of the labor force—which seems most implausible. The unemployment rate itself (or perhaps the [absolute] change in that rate) would seem to be a more sensible variable.

<table>
<thead>
<tr>
<th>Equation</th>
<th>Coefficient</th>
<th>( \hat{\rho} )</th>
<th>( \hat{\rho} )</th>
<th>( \hat{\rho} )</th>
<th>( \hat{\rho} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our Parameter Estimate</td>
<td>-3.50</td>
<td>-0.59</td>
<td>-0.11</td>
<td>0.12</td>
<td>0.50</td>
</tr>
<tr>
<td>(t-statistic in parentheses)</td>
<td>(1.34)</td>
<td>(1.90)</td>
<td>(0.83)</td>
<td>(0.61)</td>
<td>(1.89)</td>
</tr>
<tr>
<td>Arcelus-Meltzer Parameter Estimate</td>
<td>0.76</td>
<td>-0.23</td>
<td>-0.03</td>
<td>0.04</td>
<td>0.38</td>
</tr>
<tr>
<td>(t-statistic in parentheses)</td>
<td>(0.26)</td>
<td>(1.11)</td>
<td>(0.21)</td>
<td>(0.19)</td>
<td>(1.63)</td>
</tr>
</tbody>
</table>
The Arcelus-Meltzer definition of the rate of inflation is also a bit odd. If the consumer price index doubled during the year preceding the election (e.g., rose from 125 to 250), the inflation rate would be 50 per cent of their definition. According to the usual definition, however, this should be counted as a 100 per cent inflation. Arcelus and Meltzer offer no reason for their convention, and it seems to us the usual definition is preferable.

It is not clear why the \( R_l P R_i \) variable is included in the regression at all. Arcelus and Meltzer offer no explicit justification for including it, and their hypotheses about voting costs being lower during presidential than in midterm elections in no way suggest that this reduction should depend on which party holds the White House. Since this variable will be correlated with the \( R_l P R_i, R_l u, R_l \) terms, the effect of including it is to introduce more multicollinearity and decrease the accuracy of the estimates.

Finally, it is arguable that wartime elections should not have been included (or at least should have been handled differently to allow for the possibility of structural shifts in the relations being estimated), since the dislocations of a major war affect the meanings of the economic series and reduce the political importance of domestic economic (and other) issues.

**Methods**

The Arcelus-Meltzer estimates of the effects of economic variables on the parties' vote shares are obtained by separately estimating the \( VD \) and \( VR \) equations, using ordinary least-squares regression. In a footnote they comment that these estimates, though unbiased, "are not as asymptotically efficient as... the [Zellner 'seemingly unrelated regressions'] estimators." An inefficient estimator yields estimates which are unnecessarily imprecise, and thus makes it less likely that accurate and significant estimates of the effects in question will be obtained.

The Arcelus-Meltzer estimates are indeed inefficient, though not for the reason they mention. Their procedure ignores certain a priori information and constraints on the coefficients, which are implied by their theoretical hypotheses and model. In particular, their model takes the form of a system of equations:

\[
VP_t = H_t + N_{1t} + N_{2t} + \varepsilon_t \\
VD_t = \alpha_D H_t + \beta_D N_{1t} \\
\quad + [\gamma_D + \Delta \gamma_D R_l] N_{2t} + \varepsilon'_t \\
VR_t = \alpha_R H_t + \beta_R N_{1t} \\
\quad + [\gamma_R + \Delta \gamma_R R_l] N_{2t} + \varepsilon''_t,
\]

where \( H_t, N_{1t} \) and \( N_{2t} \) are the sizes of the three blocks of voters (habitual partisans, voters induced to vote by the reduction in voting costs in presidential elections, and voters induced to vote by economic issues, respectively) in election \( t \), expressed as shares of the eligible electorate. The coefficients \( \alpha_D \) and \( \alpha_R \) and \( \beta_D \) and \( \beta_R \), etc. are the Democratic and Republican shares of the votes cast by voters in the various blocks. Since they are shares, or fractions, each must lie between zero and one, and they must sum to one, minus the third-party vote (i.e. \( \alpha_D + \alpha_R = 1 - \wp \), \( \beta_D + \beta_R = 1 - \br \), etc., where \( \wp \), \( \br \), etc. are the third-party votes cast in each block). For most of the period under consideration, the aggregate congressional third-party vote has been quite small, and it is reasonable to assume that the sum of major-party coefficients is approximately unity. Thus the coefficients of the "economically motivated" block, in particular, must satisfy \( \gamma_D + \gamma_R = 1 \) and \( \gamma_D + \Delta \gamma_D + \gamma_R + \Delta \gamma_R = 1 \), implying \( \Delta \gamma_D = -\Delta \gamma_R \). If these facts are substituted into the \( VD \) and \( VR \) equations (still assuming only one economic variable, \( f \),) we get

\[
VP_t = [\ldots] + \alpha f_t + \varepsilon_t \\
VD_t = [\ldots] + (\gamma_D + \Delta \gamma_D R_l) f_t + \varepsilon'_t \\
\quad = [\ldots] + (\gamma_D a) f_t + (\Delta \gamma_D a) R_l f_t + \varepsilon'_t \\
VR_t = [\ldots] + (\gamma_R a) f_t + (\Delta \gamma_R a) R_l f_t + \varepsilon''_t \\
\quad = [\ldots] + [(1 - \gamma_D a) f_t \\
\quad + (\Delta \gamma_D a) R_l f_t + \varepsilon''_t
\]

where \([\ldots]\) is the block of terms not involving economic variables. The model implies that the coefficients of the \( f \) terms in the \( VD \) and \( VR \) equations must be of the same signs, and their sum must (approximately) equal the coefficient of the \( f \) term in the \( VP \) equation. Moreover the coefficients of the \( R_l f \) terms must be of opposite signs, and approximately equal in magnitude. Yet the results reported by Arcelus and Meltzer violate all three conditions: the signs of the \( V \) and \( C/p \) estimates in the \( VD \) and \( VR \) equations, which should agree, are opposite, while the \( R_l p \) and \( R_l C/p \) estimates, which should be opposite (and equal), are of the same signs. Moreover the \( p \) estimates in the \( VD \) and \( VR \) equations sum to \( -0.55 \), rather
than \(-0.23\), as they should, and the sum of the 
\(C/p\) estimates is also off.

Arcelus and Meltzer implicitly recognize some of 
these constraints in interpreting their results, 
and in their estimation of the \(VP\) relation. (Since 
the total participation relation is the sum of \(VD\) 
and \(VR\) equations [plus an unspecified relation 
for the negligible third-party vote], the coefficients 
in (1) must be the sum of the corresponding 
coefficients in (2) and (3). Arcelus and Meltzer do 
not include terms like \(RIr\) in (1), presumably in 
recognition of the fact that these coefficients must 
sum to zero.) Their procedure for estimating the 
\(VD\) and \(VR\) equations, however, takes no account 
of the constraints. By ignoring these constraints, 
they get inefficient (and indeed mutually 
inconsistent) estimates.\(^\text{16}\) Since several of the 
constraints are rather badly violated, it is clear 
that incorporating them would substantially affect 
their results. The "equal and opposite" constraint 
on the \(RIr\)-like terms, in particular, directly 
involves the differences between corresponding 
coefficients in the \(VD\) and \(VR\) equations, so that 
their estimates of the net effect of these variables 
may be indicative of specification problems (or 
the disturbances, however, is small; if we let 
\(e^*\), \(e^*\) be the disturbances in the \(VR, VD, VP\) 
relations respectively, then \(e^* = e^*\), and 
\(e^* = e^*\). Hence 
\(\text{Cov}(e^*, e^*) = \text{Cov}(e^* + e^*, e^* - e^*) = \sigma^2^* - \sigma^2\), 
where \(\sigma^2\) and \(\sigma^2\) are the variances of \(e\) and \(e^*\) re-

To simplify interpretation of the estimates, 
their model has been rewritten in terms of a 
second, Democratic incumbency dummy variable, 
\(DI = 1 - RI\). Then the Arcelus-Meltzer formulation 
of the form

\[ VR = [\cdots] + b_1^* DI r + b_2^* RI r + e, \]
is rewritten as

\[ VR = [\cdots] + b_1^* DI r + b_2^* RI r + e. \]

These equations are completely equivalent (\(b_1^* = b_1\) 
and \(b_2^* = b_1 + b_2\)), but \(b_1^*, b_2^*\) are direct estimates 
of the impact of the \(t\) variable during Republican 
and Democratic incumbencies respectively, so the 
interpretation is more straightforward.

To incorporate the linear constraints on the 
various coefficients discussed earlier, we subtract 
the \(VR\) and \(VD\) equations, obtaining a relation of the 
form

\[ VR - VD = [\cdots] + c_1 RI r + c_2 DI r + e', \]

where \(c_1\) and \(c_2\) are now estimates of the net effects 
of \(t\) on the parties' vote shares (i.e., of \(t\)'s effect on 
the Republican vote, minus its effect on the 
Democratic vote), during Republican and Democratic 
incumbencies, respectively. Estimating this relation 
and the total participation (\(VP\)) equation by 
ordinary (unconstrained) least squares is essentially 
equivalent\(^\text{17}\) to estimating the \(VR, VD, VP\) 
system subject to the coefficient constraints. (We 
also obtained unconstrained estimates using the 
Arcelus-Meltzer procedure, but will not report 
these results in detail.) Each equation was estimated 
four times, with the two different versions 
of the unemployment term, and first including, 
and then excluding the war years.

In the interest of brevity, we will not report all 
results in detail. Since we are primarily interested 
in the effects of economic variables on the parties' 
vote shares, we shall concentrate on the 
\(VR - VD\) equations, and report only the coefficients of 
the economic variables. These are shown in Table 1.

Since we retain the Arcelus-Meltzer specification 
of the long-term part of the model, our 
estimates, like theirs, are probably subject to 
specification bias. The Durbin-Watson statistic values 
may be indicative of specification problems (or 
alternatively of [negative] autocorrelation); in that 
case our estimates are inefficient, though the 
estimated standard errors may be too large, and 
the true significance levels higher than those reported

\(^{16}\) Henri Theil, *Principles of Econometrics* (New 
Table 1. Regression Estimates of Effects of Economic Variables on VR – VD

<table>
<thead>
<tr>
<th>War Years</th>
<th>(1) Omitted</th>
<th>(2) Included</th>
<th>(3) Omitted</th>
<th>(4) Included</th>
</tr>
</thead>
<tbody>
<tr>
<td>RI# (+)</td>
<td>.015 (.131)</td>
<td>.020 (.130)</td>
<td>.403* (.242)</td>
<td>.415** (.241)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RI# (–)</td>
<td>–.136 (.215)</td>
<td>–.145 (.212)</td>
<td>–.008 (.197)</td>
<td>–.019 (.196)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIu (–)</td>
<td>–.278* (1.63)</td>
<td>–.280** (1.157)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIu (+)</td>
<td>X</td>
<td>X</td>
<td>.581* (.443)</td>
<td>.587* (.439)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DI# (–)</td>
<td>–.185** (.909)</td>
<td>–.146** (.884)</td>
<td>–.0015 (.209)</td>
<td>.011 (.187)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DI# (+)</td>
<td>.200* (.148)</td>
<td>.196** (.114)</td>
<td>.286** (.156)</td>
<td>.312*** (.105)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIu (+)</td>
<td>–.147* (.097)</td>
<td>–.153* (.093)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIu (–)</td>
<td>X</td>
<td>X</td>
<td>.555 (.653)</td>
<td>.431 (.519)</td>
</tr>
</tbody>
</table>

\( R^2 \) | .75 | .73 | .74 | .71 |
\( d \) | 2.72 | 2.43 | 2.46 | 2.01 |

Estimated standard errors in parentheses. Intercepts and coefficients of \( X_{20}, X_{32} \) and \( PY \) not reported.

(+), (–): Predicted sign of coefficient from "incumbency" hypothesis.

***: Significant at .05 (or better) on two-tailed test.

**: Significant at .10 on two-tailed, or .05 on one-tailed, test.

*: Significant at .10 on one-tailed test.

X: Variable not included in equation.

In any event, the results as reported, though hardly conclusive, generally indicate that economic variables do affect the parties' vote shares. As a block, the economic variables account for from 17 per cent (in equation [1]) to 13 per cent (in equation [4]) of the total variance of the VR – VD series. This increment to explained variance is significant at the .10 level or better in every case, using the usual F-test. Multicollinearity among the variables tends to produce large standard errors for the individual coefficients, but even so, three or four of the coefficients in each equation approach or reach conventional significance levels. Moreover, the signs of most of the estimates are consistent with the "incumbency" hypothesis, i.e., that voters vote for or against the incumbent party according to its economic performance. In terms of magnitudes, several of the effects are respectable, though not overwhelming: for example, a 10 per cent inflation rate during a Democratic administration would decrease its plurality by two to three per cent of the eligible electorate, or (in a midterm election with turnout about 40 per cent) decrease its vote share by around 3 per cent of the votes cast. An unemployment level of 10 per cent during a Republican administration would decrease the Republican vote share by a comparable amount.

With respect to individual variables, consider inflation first. Three of the four \( DI# \) estimates are significant, and the fourth is close. The \( RI# \) estimates are not significant, and their standard errors are so large that they are not very informative, one way or the other, about the effects of inflation during Republican administrations. Nevertheless, the signs of all the estimates suggest that inflation hurts the incumbent party, and in equations (1) and (2) (which, for reasons to be given below, we see for example, Theil, pp. 255–256.)
regard as the preferable specification), the magnitudes of the estimated effects are roughly the same, under either administration. (The unconstrained \( PD \) and \( VR \) estimates form a generally similar, though less sharp, pattern: the four significant estimates are in the "incumbency" direction, and while some eight estimates [of 16] were of the "wrong" sign, only one of these even approached significance [its \( t \)-ratio was 1.33].) All things considered, our evidence indicates that inflation does have an effect on congressional elections, with high inflation hurting the incumbent President's party.

Arcelus and Meltzer also found inflation to have some effect, but in a rather different direction. They found that the main effect of inflation is to lower the Democratic vote, and hence to increase the Republican vote share. Writing before the election, they comment that their "findings for inflation suggest that the Republicans will benefit in the nonpresidential year 1974 from their failure to control inflation." We doubt that many Republicans would interpret the election results this way.

Our results also suggest that the income variable affects the parties' vote shares. Two of the \( DiR \) estimates and one of the \( BiR \) estimates are significant (another is close), and all but one of the estimates are in the "incumbency" direction (the sole exception, the \( DiP \) term in equation [4], is very close to zero and insignificant). The estimated effects are not symmetrical (in [1] and [2] the \( RiP \) estimates are close to zero, and considerably smaller than the \( DiP \) effects), though the estimates are too imprecise for detailed comparisons. In the unreported estimates of the unconstrained \( CD \) and \( VR \) equations, 13 of the 16 income estimates are in the "incumbency" direction. Four of the estimates are significant, and two others nearly so; all but one of these are in the "incumbency" direction. (The one significant estimate which goes in the other direction is in an equation involving the \( Du \) unemployment variable. We will argue below that \( Du \) is the wrong variable to use, so this result should be discounted accordingly.) In any event our results show that income does have an effect and they are generally consistent with the incumbency hypothesis.

The unemployment effects form a rather different pattern. One of the estimates is significant, and five others are close. The estimates are quite sensitive to the form of the unemployment variable; substitution of the change-in-level variable \( Du \) for the level variable \( u \) reverses the signs of the unemployment estimates, and affects several of the other estimates as well. No matter which variable is used, however, the estimates do not conform to the "incumbency" hypothesis. On a priori grounds alone, there is a strong case for the level variable \( u \); thus we would expect jobs to be a live political issue whenever the unemployment rate is high, irrespective of whether it is stable, increasing, or decreasing. The results in Table 1 reinforce this view. With the change-in-levels variable \( Du \), the estimated effects are all positive, which would imply that increasing unemployment always benefits the Republicans. We are inclined to discount this anomalous result. With the level variable \( u \), however, the estimated effects are negative, suggesting that the electorate turns to the Democrats in times of high unemployment, which is not implausible. (The unconstrained \( PD \) and \( VR \) estimates with the level variable \( u \) all conform to this pattern also, though none are significant.) We are thus inclined to reject the \( Du \) variable, and accept the results in (1) and (2) as the meaningful ones. They suggest that unemployment does have an effect, which always works in favor of the Democrats. The estimated magnitude of the effect is greater if unemployment occurs under a Republican administration (though once again, the estimates are too imprecise for detailed comparisons).

In sum, our reading of the evidence suggests that all three economic variables do influence congressional elections, and that Arcelus and Meltzer's nonfindings on income and employment can be attributed to the problems with their data and methods. The specific results reported in our Table 1 should be regarded as tentative, since as noted earlier, they may well be subject to bias because of the misspecification of the long-term model. Indeed, we are not convinced that short-term participation effects can be accurately estimated from aggregate participation data, because of the difficulties in controlling for long-term trends and variations in eligibility requirements, registration laws, polling hours, and the like. It may well prove necessary to use disaggregated data at the state or county level, in order to control adequately for such factors. But at a minimum, our reanalysis of the Arcelus-Meltzer model does, we think, confirm the basic finding of earlier studies by Kramer and others, that economic conditions do affect the outcomes of congressional elections, and do so in ways which are broadly (though not completely) consistent with the notion that the electorate rewards or punishes the party in power according to its economic performance. To be sure, there is still substantial uncertainty about the detailed nature and magnitudes of these effects. Thus while most studies are in general agreement about the role of inflation and income, the evidence on unemployment is mixed. And there may yet turn out to be...
important differences in the roles of different economic variables during Republican and Democratic incumbencies, or (as emphasized by Bloom and Price in their commentary) as between "rewarding" or "punishing" an incumbent. But on the basic question of whether such effects exist, it seems to us the evidence is clear: they do.

APPENDIX

Data and Sources


Aggregate Economic Variables and Votes for Congress: A Rejoinder*

FRANCISCO ARCELUS
AND
ALLAN H. MELTZER

Our interest in the effect of aggregate economic variables on election results began in 1970 following a conversation with an administration official that we have reported elsewhere.1 We doubted both the implicit theory of voting behavior and the ability of the administration to achieve rates of inflation and unemployment even close to the ranges mentioned. We take this opportunity to note that the unemployment rate was higher and the inflation rate substantially higher than the adviser's estimate, but President Nixon was re-elected.

At the time, the principal econometric evidence of the effects of aggregate economic variables was a study by Kramer. Kramer found evidence of an effect of real income, but despite (or perhaps because of) the flaws in his procedure, he found no evidence of an effect of inflation or unemployment.2 Furthermore, then and now, most of the reported evidence pertains to congressional not presidential elections and to votes for congressmen, not seats in the Congress.

We concluded our study by failing to reject a null hypothesis—that there was no evidence of an effect of real income or unemployment on votes for congressional candidates. We were less certain about the effect of inflation. Our evidence suggests some effect, and we have continued work on the problem by analyzing presidential voting and by much more detailed analysis of congressional votes and seats.

That more work remains to be done is evident from our current work and from the lengthy replies that our paper stimulated. Each pair of authors wrote a comment longer than our original article. They agree neither with us nor with each other on the proposition that evidence supports. Each raises some points that the other ignores.

The similarity ends there. Bloom and Price offer a scholarly criticism based mainly on their original and interesting work. Their comments are based on their assessment of evidence. We discuss their work first. Goodman and Kramer, on the other hand, offer a seemingly endless number of criticisms supported by little more than prior belief, innuendo, and conjecture. Answering each of the charges would take more space and time than the criticisms are worth. We are content to support our claim by discussing a few of their charges and by presenting evidence that most of their claims are empty.

Bloom and Price

Bloom and Price devote most of their comment to testing an alternative hypothesis of the effect of economic variables on congressional elections. They find evidence to support their hypothesis. If we had developed their evidence, we would have rejected the null hypothesis, as they do.

The hypothesis that Bloom and Price accept is different from Kramer's and, we will argue, much closer to our contention than to his. Bloom and Price show that a decline in real, per capita income hurts the party of the incumbent president in congressional elections. They do not show that small changes in the growth rate of real per capita income hurt the incumbent's party. Voters are not shown to be sensitive to small fluctuations in the growth rate of real income. In fact, they are relatively insensitive; a 1 per cent fall in real per capita income costs the incumbent's party from 0.6 per cent to 0.8 per cent of its vote, according to their estimates.

From 1948 to 1974, the maximum decline in real per capita income in an election year was 1.6 per cent in 1954. The largest shift of votes implied by the hypothesis is 1 per cent, so the maximum effect on the difference between the parties is about 2 per cent. The effects of inflation, unemployment, and small changes in the growth rate of output are not shown.

Per capita real output has grown at an average rate of 3 per cent. Nothing is shown about the range from zero to three per cent. It is entirely consistent with the results presented by Bloom and Price that small changes in employment and output have small effects, or no effect at all, on voting. Recessions shift votes, and major reces-

* We remain indebted to the National Science Foundation for support of our work.

1 See footnote 2 of our paper, "The Effect of Aggregate Economic Variables on Congressional Elections" elsewhere in this issue of the Review.

2 See G. H. Kramer, "Short-Term Fluctuations in U. S. Voting Behavior, 1896-1964," this Review, 65 (March, 1971), 131-143. Our discussion of the flaw in Kramer's treatment of minority party votes is in footnote 16 of our paper. Once an error in the data was corrected, the effect of inflation was found to be significant.
The asymmetry of the results raises questions. Why do voters respond to negative changes of 3 per cent in the average growth rate but not to positive changes or to reductions in the growth rate to 1 per cent? One reason may be that the new voters include new entrants to the labor force and workers with low seniority. These individuals bear a disproportionate share of the private cost of unemployment and recession. If they become weak or strong partisans of the party out of power, and remain loyal, we would have an explanation of the asymmetry and the effect found by Bloom and Price. An effect of this kind would not be inconsistent with our hypothesis.

All in all, we find the reformulation and the evidence presented by Bloom and Price intriguing. We hope that either they or others will investigate the asymmetry in the response to changes in real income.

Goodman and Kramer

There is, for us, a considerable difference between the proposition consistent with available evidence and the conclusion reached by Goodman and Kramer. They conclude that "on the basic question of whether such effects exist, it seems to us the evidence is weak: they do." 4

What are these "effects"? Do voters reward and punish? Or, do they punish only, as Bloom and Price find? Do voters respond only to recession, measured by the negative growth of real income, or to inflation and recession, as Kramer concluded? Or do they respond more to inflation, than to income as we found? Do regular voters respond or is the main effect on new voters?

Goodman and Kramer do little to advance the discussion beyond the a priori position from which they start. They offer almost no evidence to support the strong, and in our view, overstated conclusions they reach.

A typical example of overstatement is the discussion of the evidence they present in Table 2. The table shows estimates of the effects of real income, inflation, and two measures of unemployment in four separate regressions. Only one coefficient—the effect of inflation—is significantly different from zero by the usual two-tailed test at the .05 level.

These results, unlike the results of Bloom and Price, do not cause us to reconsider our main conclusion. Inflation appears to affect the outcome of congressional elections; the various measures of unemployment have not been shown to have any significant effect; the current growth rate of real income has not been shown to have a reliable effect, and the work of Bloom and Price suggests that there is an asymmetry. Large negative deviations are important; other deviations are either much less important or unimportant.

The discussion of unemployment in Goodman and Kramer is an example of their a priori approach. 5 One result shows that changes in unemployment benefit Republicans. This result is rejected as "anomalous." The level of unemployment benefits Democrats, and the result is accepted as plausible. In fact, the sign of the level of unemployment is negative for the Democrats, and the results show that the Democrats gain only because the Republicans are hurt more. The differences are not significant.

If this were the only example of a cavalier treatment of evidence, we would dismiss the example as an oversight. Similar examples reoccur in the discussion of evidence and estimation, as we show in the following sections.

Participation. Both pairs of critics accept our hypothesis that voters can abstain instead of shifting party preference. Bloom and Price use the percentage of the two-party vote in their work and ignore the issue. Goodman and Kramer challenge our interpretation. They assert that "participation declined rapidly from 1896 to 1912" (p. 1255). A reasonable interpretation of their Figure 1 is that participation declined from 1896 to 1902 or 1904, so that the "historical trend" of which they speak is based on two or three observations.

Goodman and Kramer claim that our equation is misspecified (p. 1257). We are, frankly, puzzled at this overstatement. Their Figure 1 seems to us to show (1) a permanent shift in the participation rate in 1920 and (2) a second permanent shift about 1932. The first is negative but larger (in absolute value) than the shift in 1932. The coefficients for these shifts, in our participation (VP) equation, are entirely consistent with the evidence.

Although the word "mis specification" is used repeatedly, there is no explicit statement of the misspecification. The only evidence Goodman and Kramer offer is from our regression equation, and this evidence is misinterpreted. They claim, incorrectly, that the residuals from our VP equa-

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4 Ibid., p. 1264.

tion are not random. The most that can be said, correctly, is that we cannot reject the hypothesis that the residuals are not randomly distributed. If the residuals are not randomly distributed, it does not follow that the model is misspecified in the sense that the estimates are inconsistent.

In short, there is no basis for the statement (p. 1257) "the Arcelus-Meltzer estimates of the long-term partisan shares are incorrect." A plausible interpretation is that the serial correlation shows our inability fully to explain short-term fluctuations in the voting percentage by introducing aggregate economic variables into the VP equation. More remains to be done.

The Shift Voters. Goodman and Kramer introduce a long, excessively formal discussion of a simple question. Where are the shift voters? To indicate the importance of the question, they cite a previous study by V. O. Key. That study, however, discusses presidential, not congressional, elections. Our recent work suggests that shifting is much more important in presidential elections.

To bolster their position, they quote selectively and inappropriately. We have italicized the words included in our proposition and omitted from their quotation. With the omitted words included, the quotation is (our p. 1238, their p. 1258): "the principal fluctuations in the percentage of votes received in congressional elections arise from changes in the participation rate and not from shifts between parties."

No lengthy, formal analysis is required to support our proposition. All that is required is computation of the change in voting percentage in presidential and nonpresidential years. The mean difference is nearly twelve percentage points, according to the estimate in our paper. This difference is a 25 per cent change in average voting participation in congressional elections between presidential and non-presidential election years. The relevance of the comparison for the proposition becomes clear once the omitted words are restored.

Basic Statistical Inference. Goodman and Kramer raise what they call a "fundamental point of basic statistical inference" (p. 1259). Their point is that the "fact that a certain estimate is not significantly different from zero by no means shows that the variable has no effect. . . . The data . . . may be equally consistent with the possibility of very large effects."

This is nonsense, pure and simple. Regardless of the size of the coefficient, relatively low t-statistics or large standard errors imply failure to reject the hypothesis that the variable in question has no effect.

Measurement of Economic Variables. A number of criticisms of our work can be discussed briefly. Some are raised by both critics.

(1) In using compensation per man hour, we ignore the unemployed. This comment is puzzling. We included measures of unemployment separately. Our procedure holds a measure of real income constant when estimating the effect of unemployment.

(2) Real compensation is an inappropriate measure of real income. Moreover, it is "suspect" (p. 1260 of Goodman and Kramer) because real compensation per man-hour rises in recession. This comment and similar comments by Bloom and Price miss the point. One of the questions that we want to answer is whether employed and unemployed workers respond in the same or in different ways to recessions. To separate the two groups we estimate the response to earnings, holding unemployment constant, and the response to unemployment, holding earnings constant. Only from estimates of this kind can we hope to learn whether the voters' response to unemployment or recession extends beyond the particular voters affected by loss of employment. The comment that we should not have deflated by man-hours is correct. We miss the effect of reductions in the work week.

(3) We take no account of the agricultural sector. This is false. We note (footnote 15) that we tried a number of other measures of economic and other issues including agricultural prices.

(4) Many additional criticisms reveal very little more than Goodman and Kramer's prior beliefs. Several relate to the use of unemployment and the procedures for computing percentages. To find whether the criticisms are substantive, we recomputed in the following ways: (1) using Goodman and Kramer's data series and ours; (2) using levels of unemployment, changes in unemployment, and percentage changes in unemployment; and (3) using percentages computed on the base t−1 and on the base t. A small sample of our results for aggregate economic variables is shown in Table 1. Others will be sent on request. Had Goodman and Kramer used some of the time lavished on their reply to compute these results, they would have found, as we did,
Table 1. The Effect of Alternative Measures of Unemployment on the Democrats' Share of the Vote

<table>
<thead>
<tr>
<th>Variable</th>
<th>Using Our Data</th>
<th>Using Goodman and Kramer Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>$o$</td>
<td>-.42</td>
<td>-.45</td>
</tr>
<tr>
<td>$P$</td>
<td>(3.37)</td>
<td>(3.97)</td>
</tr>
<tr>
<td>$U$</td>
<td>.02</td>
<td>.02</td>
</tr>
<tr>
<td>$\Delta U$</td>
<td>-.05</td>
<td>.00</td>
</tr>
<tr>
<td>$o$</td>
<td>.16</td>
<td>.08</td>
</tr>
<tr>
<td>$U$</td>
<td>(.15)</td>
<td>(.47)</td>
</tr>
<tr>
<td>$C/P$</td>
<td>(1.00)</td>
<td>(.48)</td>
</tr>
</tbody>
</table>

All percentages are computed as $\frac{t-(t-1)}{t-1}$

$U =$ level of unemployment
$\Delta U =$ change in unemployment
Other variables as defined in our paper

that their prior beliefs, conjectures about possibilities, and most of their criticisms are empty.

Our general conclusion is that most of the Goodman and Kramer points lack substantive content. Either they are inconsequential or they concern potential, not actual, bias. If we printed all of the estimates using the various data sets, we doubt whether any reader would change any conclusion as a result of reading the many pages of output.  

Conclusion

The effects of short-term changes in economic conditions on votes for Congress seems to us to remain unsettled. The work to date has produced mainly null results, our own included.

Discussion of this kind occasionally leads scientists to reformulate the disputed proposition. For this reason we find the efforts by Bloom and Price and their evidence interesting. The proposition for which they find support is substantially different from earlier statements of the effect of short-term changes in aggregate-economic variables on congressional votes.

Our own work has followed a different course. The basic unit of interest is the distribution of seats, not votes. Investigation of the distribution of seats requires disaggregation to the district level. Preliminary results suggest that incumbency alone accounts for nearly 80 per cent of the variation in the partisan distribution of seats. That leaves very little room for aggregate economic variables, but it does not rule out a small effect. Until such effects are found and confirmed, the null hypothesis cannot be rejected.
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