Voting and the Macroeconomy

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The people have been promised more than can be promised; they have been given hopes that it will be impossible to realize ... The expenses of the new regime will actually be heavier than the old. And in the last analysis the people will judge the revolution by this fact alone – does it take more or less money? Are they better off? Do they have more work? And is that work better paid?

Mirabeau [Honoré Gabriel Riquetti] (1791)

All Political history shows that the standing of the Government and its ability to hold the confidence of the electorate at a General Election depend on the success of its economic policy.

Harold Wilson (1968)

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1 Introduction

The proposition that support enjoyed by rulers among the ruled is decisively affected by economic conditions undoubtedly has been true since the formation of the first political communities. Empirical studies of systematic connections of voting and the macroeconomy began to appear in the mid-1920s,[1] though by today's standards the early research applied quite casual statistical techniques, typically lacked well articulated falsifiable hypotheses, and were not underpinned by any recognizable theoretical framework.

The landmark event in the modern history of research on macroeconomic conditions and election outcomes is Gerald Kramer's 1971 article on US voting behavior.[2] Kramer's work was inspired by the broader framework set out by Anthony Downs in *An Economic Theory of Democracy* (1957) – by a wide margin the most important work on the political economy of electoral democracies published in the twentieth century. Kramer proposed a clear model for macroeconomic voting, and its empirical predictions were subject to formal econometric tests. No one had done this before. Like Downs, Kramer viewed parties as alternative governing teams. Voters were presumed to be rational, self-interested and future-oriented actors for whom acquiring and analyzing massive amounts of potentially relevant information was costly and impractical. Instead, he assumed that voters adopt a simple, efficient decision rule: If the incumbent's performance is "satisfactory", vote to retain the incumbent party; if not, vote for the opposition.[3]

Kramer calibrated "satisfactory" performance by favorable differences between realized and expected macroeconomic outcomes at the election year, on the assumption that the best readily available guide to future well-being was performance over the most recent year. Expected performance was in turn assumed to given by outcomes realized the previous year. Accordingly, the macroeconomic arguments of Kramer's vote equations were election year growth rates of per capita real personal income and consumer prices, and the election year change of the unemployment rate. The dependent variable was the aggregate congressional vote share going to the president's party in non-presidential elections years, and a weighted average

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[1] See Monroe (1979) for a review of much of the early research. Reviews of research since 1970 include Nannestad and Paldam (1994) and Lewis-Beck and Stegmaier (2000). The most comprehensive recent guide to research on nearly all aspects of macro political economy and public choice is undoubtedly Mueller (2003). Another outstanding treatise, which covers a broad range of macro political economy and is lodged within a specific yet quite flexible analytical framework, is Drazen (2000). Gärtner (1994) masterfully reviews a narrower zone of the macro political economy field with exceptional pedagogical flair.

[2] In fact an efficient way to track the growth of the literature is to track citations to Kramer's 1971 paper.

[3] Years later, Ferejohn (1986, 1999) developed some micro foundations for such simple voting rules in the context of pure retrospective voting theory. I discuss this work in section 4.

of congressional and presidential vote shares in presidential election years, with the weights being a function of the estimated spillover from (especially strong or weak) presidential candidates to congressional candidates of the president's party.[4] Kramer's regression experiments showed that the growth of per capita real personal income exerted robust positive effects on aggregate voting outcomes from 1896 to 1964. In the presence of real income growth rates, inflation and changes in unemployment appeared to have little or no electoral importance – a result that by and large has been sustained over a generation of subsequent empirical research.[5]

Key features of Kramer's model were part of the maintained hypothesis. He supplied no evidence that the stochastic properties of macroeconomic variables supported his assumption that the best forecast of future innovations to inflation and real income growth was current growth rates, or that the best forecast of innovations to unemployment was current changes in the rate. Nor did he undertake any tests supporting the assumption that economic voting was forward-looking (prospective), as opposed to being purely retrospective, with past performance yielding electoral rewards and punishments regardless of the implications of past outcomes for the future. Furthermore, Kramer provided no mechanism mapping the behavior of individual, self-interested voters applying simple decision rules onto the aggregate vote shares populating his regression experiments. Treatment of those issues came during the decades afterward, on the back of Kramer's seminal contribution. Much of this chapter is a tour of the more important developments.

2   Aggregate Vote Shares and Individual Electoral Choices

The second major event in the emergence of sophisticated empirical analysis of voting and the macroeconomy is Ray Fair's famous 1978 article on economic voting for US presidents. Like Kramer, Fair adopted the Downsian environment of rational, self-interested voters whose electoral behavior is driven by maximization of expected future utility under the available political alternatives. Fair experimented with various combinations of within-term macroeconomic outcomes and outcomes

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[4]All by itself, the spillover mechanism was a significant contribution to voting theory, and it spawned a whole branch of research on presidential "coattails" which falls outside the scope of this chapter.

[5]Kramer's estimates implied a 4 to 5 percentage point rise (decline) in the vote share for each 1 percentage point rise (decline) in the real income growth rate. Hibbs (2000) obtained nearly identical estimates of the effect of real income growth rates (sustained over the entire term, rather than just the election year) on aggregate post-war presidential voting outcomes – a consistency of results displaced by one branch of government, by twenty-nine years of research time, and by more than a half-century of electoral time from Kramer's ground-breaking paper.

observed during previous administrations of both the current incumbent and current opposition parties, and he concluded (as many others have since) that only within-term macroeconomic conditions affected voting. Fair revised his equations sequentially from one presidential election to the next in a quite openly ad-hoc fashion, and from the start offered no explanation of how the various statistically significant, pre-election output growth and inflation variables in his regressions could rationally be informative about voters' "highest expected future utility". Perhaps Fair's most enduring contribution to applied macroeconomic voting theory was spelling out the strong assumptions necessary to get from individual, utility-maximizing voters to a linear aggregate voting equation.

Fair's derivation may be described as follows. Let U_{it}^I denote voter i's expected future utility under the incumbent party (political bloc) at election period t, and let U_{it}^O be the corresponding expected utility under the opposition party (political bloc). Let V_{it} equal 1.0 if voter i votes for the incumbent, and equal 0.0 otherwise. Utilities are determined by linear equations of the form

$$
\begin{aligned}
U_{it}^I &= \mathbf{X}_t \mathbf{b} + v_{it}^I \\
U_{it}^O &= \overline{\mathbf{X}} \mathbf{b} + v_{it}^O
\end{aligned}
\tag{1}
$$

$$
Cov\left(\mathbf{X}, v^{I,O}\right) = 0
$$

where $\mathbf{X}_t$ denotes a matrix of variables observed at periods during the incumbent's tenure, $\overline{\mathbf{X}}$ is a matrix of constants (the implicit standards against which the incumbent is evaluated), $\mathbf{b}$ is the associated vector of parameters, and $v_{it}^{I,O}$ are random events affecting utilities at each election that are unobserved by the investigator. $\mathbf{X}$, $\overline{\mathbf{X}}$ and $\mathbf{b}$ are common to voters.[6] Individual voting choices are determined by the party/candidate delivering the highest utility:

$$
V_{it} = \begin{cases} 1 & \text{if } U_{it}^I \succeq U_{it}^O \\ 0 & \text{if } U_{it}^I < U_{it}^O. \end{cases}
\tag{2}
$$

Letting $v_{it} = \left(v_{it}^O - v_{it}^I\right)$, the probability P of observing a vote for the incumbent is therefore

$$
\begin{aligned}
P\left(V_{it} = 1\right) &= P\left[\left(\mathbf{X}_t - \overline{\mathbf{X}}\right)\mathbf{b}\right] \succeq v_{it} \\
&= F_t\left[\left(\mathbf{X}_t - \overline{\mathbf{X}}\right)\mathbf{b}\right]
\end{aligned}
\tag{3}
$$

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[6]For a K dimensional matrix of X's, $\mathbf{X}_t \mathbf{b}$ should then be understood to represent

$$
\mathbf{X}_t \mathbf{b} = \sum_{k=1}^{K} \sum_{j} b_{kj} X_{kt-j}.
$$

Fixing $\mathbf{b}$ over i (i.e. assuming that all voters react to macroeconomic outcomes and other variables in the same way) is of course an especially strong constraint. Alesina, Londregan and Rosenthal (1993), however, show how imposing some regularity conditions on the distribution of individual sensitivities to $\mathbf{X}$ may give this assumption a degree of plausibility.

where F_t is the cumulative distribution function of v_i at any election. Linearity of an aggregate voting equation is achieved by assuming the deviations $\tilde{v}_i = (v_i|t - \overline{v}_t)$ to be evenly distributed across voters at each election between some constants, say $\underline{d} < 0$ and $\overline{d} > 0$, with uniform probability density $f_t(\tilde{v}_i) = \frac{1}{\overline{d}-\underline{d}}$ and associated cumulative distribution function $F_t(\tilde{v}_i) = \frac{\tilde{v}_i-\underline{d}}{\overline{d}-\underline{d}}$.[7] The vote probabilities are then

$$P(V_{it} = 1) = \frac{-\underline{d} + \left(\mathbf{X}_t - \overline{\mathbf{X}}\right)\mathbf{b} - \overline{v}_t}{\left(\overline{d} - \underline{d}\right)}. \tag{4}$$

Taking averages over N voters (with N large enough to approximate an "infinity" of votes) to find $\frac{1}{N}\sum_{i=1}^{N} V_{it} \equiv V_t$, yields the aggregate, linear voting function most commonly used in empirical analysis

$$V_t = \alpha + \mathbf{X}_t\boldsymbol{\beta} + u_t \tag{5}$$

where $\alpha = \frac{-\underline{d}-\overline{\mathbf{X}}\mathbf{b}}{\overline{d}-\underline{d}}$, $\boldsymbol{\beta} = \frac{\mathbf{b}}{\overline{d}-\underline{d}}$, $u_t = -\frac{\overline{v}_t}{\overline{d}-\underline{d}} \sim white\text{-}noise$. Note that if the upper and lower bounds of the distribution of electoral shocks are equal in absolute value, i.e. $\overline{d} = -\underline{d}$, then the effects of $\left(\mathbf{X}_t - \overline{\mathbf{X}}\right)$ would yield deviations of V_t from an expected vote share of $1/2$.

3 Two Views of Economic Voting: Prospective and Retrospective

Macroeconomic voting divides naturally into two main views defined by voters' time horizons: prospective and retrospective. In the prospective view, the expected future relative performance of contestants for office is all that matters. Prospective valuation is akin to the pricing of financial assets in efficient markets: The parties' stock of votes at elections (current asset values) is determined completely by rationally formed expectations of future benefits, calibrated in units of voter utility. Hence electoral choice is a political investment in the future to which a party's (candidate's, political bloc's) past performance per se has no relevance. As Downs put it: "Each citizen ... votes for the party he believes will provide him with higher utility than any other party during the coming electoral period." (1957:38)

By contrast, under pure retrospective voting, elections are referenda on the governing party's performance in office. Voters reward "good" performance and

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[7]The assumption of a uniform or even distribution is not all that restrictive in most settings. The distribution functions of more plausible bell-shaped alternatives, such as the normal and logistic, are quite flat over aggregate voting outcomes in the 35% to 65% range, which encompasses most election outcomes.

punish "bad" performance. In the words of the original proponent of retrospective voting assessments, V.O. Key: "Voters may reject what they have known; or they may approve what they have known. They are not likely to be attracted in great numbers by promises of the novel or unknown." (1966:61) For retrospective voters, bygones are never bygones (as they are under a purely forward-looking orientation), but rather comprise the driving force of political valuation and electoral choice.[8]

In the generation since the rational expectations revolution in economic theory, with its strong and often compelling emphasis on forward-looking behavior, pure retrospective voting frequently has been described as naïve and irrational. Those characterizations have a certain normative, even messianic quality about them, but from a positive point of view are misguided. Building on a germinal paper of Barro (1973), Ferejohn (1986) constructed a well-known micro-founded model of Key's main arguments, with aggregate implications that have received much stronger support in data than prospective voting models. The central idea is that the electorate stands in a principal-agent relation to the incumbent party. Voters settle up with their agents by evaluating performance ex post for much the same reason – moral hazard – that insurance premiums are typically experience rated and that compensation of top corporate executives is generally heavily dependent upon past increases in share prices. Under pure retrospective valuation, promises to do better in the future are discounted completely, and exert no influence on voting choices. Instead, retrospective theory emphasizes the efficiency of inducing governing parties always to do their best in certain knowledge that voting settlements will be based on observed outcomes over the term, no matter how attractive are (inherently unenforceable) commitments to improve in the future. Opposition parties merely function as replacements on occasions when incumbents do not satisfy a fixed, attainable standard of performance.

In order for the underlying micro model to pass through, voters must react to macroeconomic performance, rather than to individual benefits ("sociotropic" voting), which in turn presumes implicit coordination among voters (and perhaps among party agents as well) in application of collectivist or utilitarian valuation standards.[9] If voting behavior were individualistic ("egotropic"), incumbents could pursue a divide and rule strategy by exploiting distributive conflicts in the electorate, and thereby mitigate, or perhaps avoid completely, the discipline of having to satisfy a minimal standard of macroeconomic performance augmenting aggregate welfare. A further implication of a principal-agent motivation of retrospective voting, though not a strict requirement, is that the electorate should valuate performance over the incumbent's entire term of office, with little or no backward

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[8]See Fiorina (1981) for a comprehensive treatment of the history, mechanics and survey-based evidence concerning retrospective voting in the United States.

[9]Ferejohn (1999) elaborates upon his initial model and sketches a theory of how such coordination might arise among the constituent agents of parties, as well as among voters.

time discounting of performance outcomes.

4   Empirical Implementation

Consider a mandate period of duration T. A fairly general model encompassing both retrospective and prospective voting motivations would look like

$$V_t = \alpha + \sum_{k=1}^{K}\sum_{j=0}^{T-1} \mu_{kj}\ X_{k,t-j} + E_t\left(\sum_{k=1}^{K}\sum_{j=1}^{T} \phi_{kj}\ X_{k,t+j}\right) + u_t \qquad u_t \sim white\text{-}noise$$

(6)

where E_t denotes expectations conditioned on voters' time t information set.[10] $\phi_k = 0$ yields pure retrospective voting; $\mu_k = 0$ implies that voting is purely prospective.[11]   For (6) to be operational we need to constrain the lag and lead parameters. The natural assumption for the prospective component is to impose a present discounted value with a constant rate of time preference. Stigler (1973) proposed the same approach to constraining retrospective evaluations. (See section 4.3.) Simplified in those ways, the general model is

$$V_t = \alpha + \sum_{k=1}^{K}\sum_{j=0}^{T-1} \mu_k\ \lambda^j\ X_{k,t-j} + E_t\left(\sum_{k=1}^{K}\sum_{j=1}^{T} \phi_k\ \delta^j\ X_{k,t+j}\right) + u_t,$$

(7)

where $\lambda, \delta \in [0,1]$ are one period discount factors.

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[10]The lag-lead sequences in (6) are based on the timing convention that elections yielding $V_t, V_{t+T},...$ occur after the realizations of outcomes $X_{k,t}, X_{k,t+T}....$

[11]In systems with variable election dates, one cannot define the prospective time horizon in closed form. I arm-wave away the complication of endogenous election dates.

Prospective voters could take account of the consequences of performance during the post-election term for performance during periods afterward. (If macroeconomic variables have unit roots, then performance shocks persist indefinitely, and a rational voter's time horizon might accordingly span the indefinite future.) In analogous fashion, retrospective voters might look further back than the most recent term when forming electoral valuations, on the argument that current support can be viewed as a "political capital stock" of parties that accumulates over long periods of time. Fiorina (1977, 1981) and Hibbs (1982b) advanced models with this feature.

As the discussion ahead should make clear, the first possibility is observationally equivalent to a one term-ahead prospective time horizon. The retrospective possibility, however, is testable, and in the case of macroeconomic voting for US Presidents it has been rejected in at least two studies: Hibbs (2000) and Peltzman (1990).

4.1 Pure Prospective Voting

Consider first pure forward-looking, prospective voting ($\mu_k = 0$). Voting outcomes in this case are driven by

$$V_t = \alpha + E_t \left(\sum_{k=1}^{K} \sum_{j=1}^{T} \phi_k \, \delta^j \, X_{k,t+j} \right) + u_t. \tag{8}$$

Empirical analysis of forward voting requires specification of how expectations are formed. The forecasting workhorses favored by time series specialists for most log real macroeconomic variables are random walks with drift and low-order autoregressions of first differences.[12] Alternatively, one could assume that expectations are based on forecasts from unconstrained multivariate autoregressions. Either way, using pre-election histories to forecast post-election realizations of relevant macroeconomic variables yields prospective voting equations that are observationally equivalent to retrospective equations.[13] Moreover, taking forecasts of future outcomes from past realizations of relevant variables implies that voters have no way of distinguishing, or make no attempt to distinguish, macroeconomic developments owing to competent, effective governance from what likely would occur in a neutral policy setting – a theoretical deficiency that was overcome by so-called "rational retrospective" models.

4.2 Prospective Voting as 'Rational' Retrospection

Rational retrospective voting set-ups originate with "signalling" models devised by Rogoff and Sibert (1988) and Rogoff (1990) to motivate fiscally driven political business cycles when incumbents face a forward-looking electorate endowed with rational expectations, as opposed to the backward-looking, "myopic" electorate relying upon adaptive expectations that was assumed in Nordhaus's (1975) path-breaking paper. The central idea is that economic voting is driven by the competence of the incumbent in producing favorable macroeconomic performance beyond what would be anticipated from the economy's development in a policy-neutral environment. The competence of elected authorities in managing the economy is persistent and, consequently, voters are able to infer useful information about unobserved post-election macroeconomic performance under the incumbent from observed pre-election performance. The mechanics of the rational decision-making process depend upon assumptions about the electorate's information set and the persistence of competence. Variations on what voters know and when they know

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[12]See, for example, Mankiw and Shapiro (1985), Kormendi and Meguire (1990), and Stock and Watson (2003).

[13]This point was developed by Blinder (1985) in his comments on Kirchgässner (1985).

it determine the specifics of closed form solutions, but not the qualitative implications as long as voters are informed of within-term macroeconomic outcomes.[14]

Imagine that real output growth is the macroeconomic variable that voters are mainly concerned about, and that log output, q, evolves as a first-order moving average process with drift. For simplicity let periods, t, denote half of the electoral term. The structure is

$$q_t - q_{t-1} = \overline{q} + \varepsilon_t \qquad (9)$$

$$\varepsilon_t = \eta_t + \psi_t, \qquad \psi_t \sim white\text{-}noise, \ E\left(\eta_t, \psi_{t+j}\right)\}_{j=-\infty}^{+\infty} = 0 \qquad (10)$$

$$\eta_t = \kappa_t + \theta\kappa_{t-1}, \qquad \kappa_t \sim white\text{-}noise, \ \theta \in (0, 1]. \qquad (11)$$

Output growth rates are determined by a constant drift of $\overline{q}$ per period, and by shocks ε_t that perturb the economy every period. ε_t is composed of a purely transitory component, ψ_t, which represents good or bad "luck" and, therefore, does not discriminate systematically between government and opposition, and a competency component, η_t, which does discriminate because it persists for the duration of a given incumbent team's term (here two periods). Luck and competence have zero covariance. The competency of parties currently in opposition is without loss of generality normalized to zero, and so η denotes the relative competence of the incumbent party during the present term. The ex ante expectation of $\eta(\kappa)$ is also normalized to zero without loss of generality. Further, competency is tied to parties in office, not individual office-holders. Consequently, if the incumbent party is re-elected, the effects of its competence spill over to growth rates realized during the following term (but no further), even if its dramatis personae are not seeking re-election (as, for example, when a sitting US president is not a candidate).

If equation (8) is the operative vote function, rational retrospective voting implies that V_t is driven by the expected competence of the incumbent party in delivering favorable output growth rates over the next mandate period:

$$\begin{aligned} V_t &= \alpha + E_t(\phi \cdot (\delta\Delta q_{t+1}|\overline{q} + \delta^2\Delta q_{t+2}|\overline{q})) + u_t \qquad (12) \\ &= \alpha + E_t\left(\phi \cdot (\delta\eta_{t+1} + \delta^2\eta_{t+2})\right) + u_t. \end{aligned}$$

How are rational expectations of η_{t+1} and η_{t+2} formed at election period t? Voters understand the stochastic structure of the real macroeconomy generating output growth rates – equations (9)-(11) are common knowledge. However, voters observe only realizations of Δq and the composite shocks, ε, during the current

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[14]If for some inexplicable reason voters had information only about election period performance then both traditional retrospective and rational retrospective models would be entirely notional, and voting necessarily could be affected only by election period outcomes.

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term; i.e. at times t and $t-1$ in a two-period representation. Hence, although competence is not observed directly in the variant of the model laid out above, forward-looking voters gain some leverage on its future realizations under the incumbent from within-current-term performance.

Consider first expected competence during the latter half of the upcoming term, η_{t+2}. Voters know that

$$
\begin{aligned}
\eta_{t+2} &= \Delta q_{t+2} - \overline{q} - \psi_{t+2} \\
&= \kappa_{t+2} + \theta \kappa_{t+1}.
\end{aligned}
\tag{13}
$$

Taking the time t conditional expectation yields

$$
\begin{aligned}
E_t \left(\eta_{t+2} | \Delta q_t, \Delta q_{t-1}, \overline{q} \right) &= E_t \left(\kappa_{t+2} + \theta \kappa_{t+1} \right) \\
&= 0.
\end{aligned}
\tag{14}
$$

Although the incumbent's relative competence is persistent, in a two-period representation its effects on growth cannot carry over beyond the first period of the subsequent term, that is, to periods deeper into the post-election term than the duration of competence persistence.

Current-term performance is, however, informative about competence in the first part of the upcoming term, η_{t+1}. We have[15]

$$
\begin{aligned}
\eta_{t+1} &= \Delta q_{t+1} - \overline{q} - \psi_{t+1} \\
&= \kappa_{t+1} + \theta \kappa_t.
\end{aligned}
\tag{15}
$$

$$
E_t \left(\eta_{t+1} | \Delta q_t, \Delta q_{t-1}, \overline{q} \right) = \theta \cdot E_t \left(\kappa_t \right).
\tag{16}
$$

Equations (9)-(11) imply

$$
\kappa_t = \Delta q_t - \overline{q} - \theta \kappa_{t-1} - \psi_t.
\tag{17}
$$

Substituting for $\kappa_{t-1} = \Delta q_{t-1} - \overline{q} - \theta \kappa_{t-2} - \psi_{t-1}$ gives

$$
\begin{aligned}
\kappa_t &= \left(\Delta q_t - \overline{q} \right) - \theta \left(\Delta q_{t-1} - \overline{q} \right) - \left(\psi_t - \theta \psi_{t-1} - \theta^2 \kappa_{t-2} \right) \tag{18} \\
&\Rightarrow \left(\kappa_t + \psi_t - \theta \psi_{t-1} - \theta^2 \kappa_{t-2} \right) = \left(\Delta q_t - \theta \Delta q_{t-1} - (1 - \theta) \overline{q} \right). \tag{19}
\end{aligned}
$$

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[15]Note that at any election period t the conditional expectation of both η_{t+1} and η_{t+2} for a new government under the current opposition is zero, given that η norms the incumbent's competence relative to an opposition competence of nil. And should the opposition win the election at t, its ex post competence at the first period of the new term, η_{t+1}, would be just the first period realization κ_{t+1}, since at $t+1$ the lagged competency term $\kappa_t = 0$ when the governing party changes.

The linear projection of κ_t on $\left(\kappa_t + \psi_t - \theta\psi_{t-1} - \theta^2\kappa_{t-2}\right)$ yields

$$\left(\frac{E\left(\kappa_t' \cdot \left(\kappa_t + \psi_t - \theta\psi_{t-1} - \theta^2\kappa_{t-2}\right)\right)}{E\left(\left(\kappa_t + \psi_t - \theta\psi_{t-1} - \theta^2\kappa_{t-2}\right)' \cdot \left(\kappa_t + \psi_t - \theta\psi_{t-1} - \theta^2\kappa_{t-2}\right)\right)}\right) \quad (20)$$
$$= \frac{\sigma_\kappa^2}{\left(1+\theta^4\right)\sigma_\kappa^2 + \left(1+\theta^2\right)\sigma_\psi^2}.$$

Hence the effect of the incumbent's competence on growth during the next mandate period implied by (16) is

$$E_t\left(\eta_{t+1}|\Delta q_t, \Delta q_{t-1}, \overline{q}\right) = \theta \cdot \frac{\sigma_\kappa^2}{\left(1+\theta^4\right)\sigma_\kappa^2 + \left(1+\theta^2\right)\sigma_\psi^2} \cdot \left[\begin{array}{c} \Delta q_t - \theta\Delta q_{t-1} \\ -\left(1-\theta\right)\overline{q} \end{array}\right], \quad (21)$$

which in view of (12) implies the estimable regression relation

$$V_t = \tilde{\alpha} + \beta \cdot \left(\Delta q_t - \theta\Delta q_{t-1}\right) + u_t \quad (22)$$

where $\tilde{\alpha} = \left[\alpha - \beta\left(1-\theta\right)\overline{q}\right], \quad \beta = \phi\delta\theta\left(\frac{\sigma_\kappa^2}{\left(1+\theta^4\right)\sigma_\kappa^2 + \left(1+\theta^2\right)\sigma_\psi^2}\right)$. By contrast to conventional retrospective voting models, rational retrospective models therefore have the testable (and, at first blush, peculiar) requirement that the effects of pre-election growth rates on voting outcomes oscillate in sign.[16]

Rational retrospective, persistent competency models are quite ingenious but their influence has been confined wholly to the realm of detached theory. Such models have received no support in data. Alesina, Londregan and Rosenthal (1993), and Alesina and Rosenthal (1995) appear to be the only serious empirical tests undertaken so far, and those studies found that US voting outcomes responded to observed output growth rates, rather than to growth rate innovations owing to persistent competence carrying over to the future.[17] As a result,

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[16] In a model with more conventional periodicity (quarterly, yearly) and correspondingly higher order moving average terms for the persistence of competence, the effects of lagged output growth rates on voting outcomes would exhibit the same damped magnitudes and oscillation of signs as one looks further back over the current term, that is, from election period t back to the beginning of the term at period $t-\left(T-1\right)$. See Hamilton (1994:chapter 4) for recursive computation algorithms for generating optimal forecasts from higher-order moving average models.

[17] The empirical analyses were based mainly on a variant of the rational retrospection model in which voters learn competency after a one period delay. In a two-period set-up with first-order moving average persistence of competence, voters react to the weighted growth rate innovation

$$E_t\left(\eta_{t+1}|\Delta q_t, \Delta q_{t-1}, \overline{q}\right) = \theta \cdot \frac{\sigma_\kappa^2}{\sigma_\kappa^2 + \sigma_\psi^2} \cdot \left[\Delta q_t - \overline{q} - \theta\kappa_{t-1}\right].$$

As I pointed out before, higher-order moving average processes also would generate damped magnitudes and oscillation of signs of coefficients for the lagged competence terms.

the rational retrospective model was rejected empirically in favor of conventional retrospective voting. Yet competency models of forward-looking electoral behavior have a theoretical coherence that is sorely lacking in much of the literature on macroeconomic voting, and the absence of more extensive empirical investigation is therefore rather surprising.[18] The econometric obstacles posed by theoretical constraints intrinsic to these models are probably part of the explanation.

4.3 Pure Retrospective Voting

Equation (7) evaluated at $\phi_k = 0$ gives a constrained model of pure retrospective voting suited to empirical testing:[19]

$$V_t = \alpha + \sum_{k=1}^{K} \sum_{j=0}^{T-1} \mu_k \ \lambda^j \ X_{k,t-j} + u_t. \tag{23}$$

The basic functional form of this equation was to my knowledge first proposed by Stigler (1973) in his prescient critique of Kramer (1971). Stigler worked mainly with a single macroeconomic variable – changes in per capita real income – and he again was first to suggest that changes in "permanent" income,[20] calibrated over a substantial retrospective horizon, would logically be the place to look for macroeconomic effects on voting, although like so many ideas in macro political economy a rougher formulation of this hypothesis can be found in Downs (1957). Moreover, Stigler yet again was the first to connect instability of economic voting regression results to variation in the "powers or responsibilities" of the incumbent

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[18]Suzuki and Chappell (1996) investigated what they regarded as a rational prospective model of aggregate US voting outcomes. They applied various time series procedures to disentangle the permanent component of real GNP growth rates from the transitory component, and found some evidence that election year growth in the permanent component had more effect on aggregate voting outcomes than fluctuations in the transitory component. Unlike the Alesina et al. competency models, however, Suzuki and Chappell's regression set-ups are inherently unable to distinguish forward-looking voting from purely retrospective voting based on permanent innovations to output, as in the model of Hibbs (2000) discussed ahead.

[19]Many studies supplement the macroeconomic regressors of aggregate voting models with aggregated survey reports of presidential "job approval," policy "moods," economic "sentiments," party "attachments" ("party identification"), candidate "likes and dislikes" and related variables. (The most recent example I am aware of is Erikson, Mackuen and Stimson (2002)). Such perception-preference variables, however, are obviously endogenous to economic performance or voting choices or both, and consequently are logically unable to contribute any insight into the fundamental sources of voting behavior.

[20]"... the performance of a party is better judged against *average* [real per capita income] change" ... "there is a close analogy between voting in response to income experience and the consumer theory of spending in response to durable ('permanent') income." (1973:163, 165)

party[21] – an important research theme that did not receive systematic empirical attention until a generation later.[22] Following Kramer, Stigler focused primarily on aggregate Congressional vote shares going to the party holding the White House, and his results did not yield much evidence of stable macroeconomic voting from the turn of the twentieth century up to the mid-1960s.

However, about a decade afterward Hibbs (1982a) showed that the basic retrospective set-up of (23), specified with growth rates of per capita real disposable personal incomes over the fifteen post-inauguration quarters of a presidential term as the only regressors, explained post-war aggregate US presidential voting outcomes remarkably well. The biggest deviations from fitted vote shares were at the war elections of 1952 (Korea) and 1968 (Vietnam). A subsequent version of the basic set-up – Hibbs's (2000) "Bread and Peace Model" – took direct account of the electoral consequences of US involvement in undeclared wars by proposing the following simple retrospective equation, which was fit to data on aggregate presidential voting over 1952-1996

$$V_t = \alpha + \beta_1 \sum_{j=0}^{14} \lambda_1^j \, \Delta \ln R_{t-j} + \beta_2 \sum_{j=0}^{14} \lambda_2^j \, KIA_{t-j} \cdot NQ_t + u_t \qquad (24)$$

where V is the incumbent party's percentage share of the two-party presidential vote, R is quarterly per capita disposable personal income deflated by the Consumer Price Index, $\Delta \ln R_t$ denotes $\log(R_t/R_{t-1}) \cdot 400$ (the annualized quarter-on-quarter percentage rate of growth of R),[23] KIA denotes the number of Americans killed-in-action per quarter in the Korean and Vietnamese civil wars, and NQ is a binary nullification term equal to 0.0 for Q quarters following the election of a new President, and 1.0 otherwise. NQ defines the "grace period" for new presidents "inheriting" US interventions in Korea and Vietnam, that is, the number of quarters into each new president's administration over which KIA exerted no effect at the subsequent presidential election.[24]

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[21] "Per capita income falls over a year or two – should the voter abandon or punish the party in power? Such a reaction seems premature: the decline may be due to developments .. beyond the powers or responsibilities of the party." (1973:164)

[22] I take up what has come to be known as the "clarity of responsibility" hypothesis in the next section.

[23] The growth rate of R is probably the broadest single aggregate measure of proportional changes in voters' personal economic well-being, in that it includes income from all market sources, is adjusted for inflation, taxes, government transfer payments and population growth, and moves with changes in unemployment. R does not register, however, the benefits of government supplied goods and services.

[24] As a practical matter, NQ determines the extent to which the 1956 vote for Dwight Eisenhower (who inherited American involvement in the Korean civil war from Harry Truman) was affected by US KIA in Korea after Eisenhower assumed office in 1953, and the extent to which

Hibbs (2000) found that real income growth rates accounted for around 90 per cent of the variance of presidential voting outcomes in the "non-war" elections, and were subject only to modest (if any) discounting over the term ($\hat{\lambda}_1 = 0.954$). The flow of American KIA was not discounted at all ($\hat{\lambda}_2 = 1.0$),[25] although the grace period for presidents inheriting the wars was estimated to be a full term ($\widehat{NQ} = 16$). Those estimates implied that that each sustained percentage point change in per capita real income yielded a 4 percentage point deviation of the incumbent party's vote share from a constant of 46 per cent ($\hat{\beta}_1 / \sum_{j=0}^{14} \hat{\lambda}_1^j = 4.1$, $\hat{\alpha} = 46$), and that every 1000 combat fatalities in Korea and Vietnam depressed the incumbent vote share by 0.37 percentage points ($1000 \cdot \hat{\beta}_2 = -0.37$). Cumulative KIA reduced the incumbent vote by around 11 percentage points in 1952 as well as in 1968, and almost certainly was the main reason the Democratic party did not win those elections.[26] (See Figure 1.) No post-war event – economic or political – affected US presidential voting by anything close to this magnitude.

Hibbs (2000) took the political relevance of KIA to be self-evident. The statistical impact of real income growth rates was rationalized theoretically by establishing that log real per capita disposable personal income evolves as a random walk with fixed drift. Changes in $\ln R$ net of drift were shown to be unpredictable ex ante, and therefore were taken to be innovations to aggregate economic well-being that could rationally be attributed to the competence of incumbents – particularly during the post-war, post-Keynesian era of mature policy institutions in a large, relatively autonomous economy in which two established parties dominated national politics. Combined with the low, near-uniform weighting of innovations to log real incomes over the term, Hibbs' results supplied evidence favoring pure retrospective voting in US presidential elections which was impossible to reconcile with the prospective, "persistent competence" models discussed previously.[27]

However, simple retrospective models in the form of (23)-(24), which infer political responsibility entirely from the stochastic properties of macroeconomic driving variables, are not readily transferred to a broad international sample of elections because of great cross-national variation in institutional arrangements

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the 1972 vote for Richard Nixon (who inherited US engagement in the Vietnamese civil war from Lyndon Johnson) was affected by US KIA in Vietnam after Nixon assumed office in 1969.

[25] The point estimate $\hat{\lambda}_1$ is also compatible with uniform weighting of income growth rates over the term, as the null hypothesis $\hat{\lambda}_1 = 1$ could not be rejected at reasonable confidence levels.

[26] The cumulative numbers of Americans killed-in-action at the time of the 1952 (Korea) and 1968 (Vietnam) elections were almost identical: 29,300 and 28,900, respectively, so re-estimation of the model with a binary war variable coded unity for 1952 and 1968 would yield results nearly identical to those discussed in the main text.

[27] Alesina and Rosenthal (1995:202) claimed that their rational retrospective models have functional forms that "resemble the distributed lag empirical specifications of Hibbs (1987)." But this assertion is erroneous because, as shown earlier, their competence models always yield oscillation in the signs of the effects of lagged growth rates on current voting outcomes.

and economic constraints that rational voters would internalize when evaluating government responsibility for macroeconomic fluctuations in order to make electoral choices. To this important topic I now turn.

Real Income Growth and the Two-Party Vote Share of the
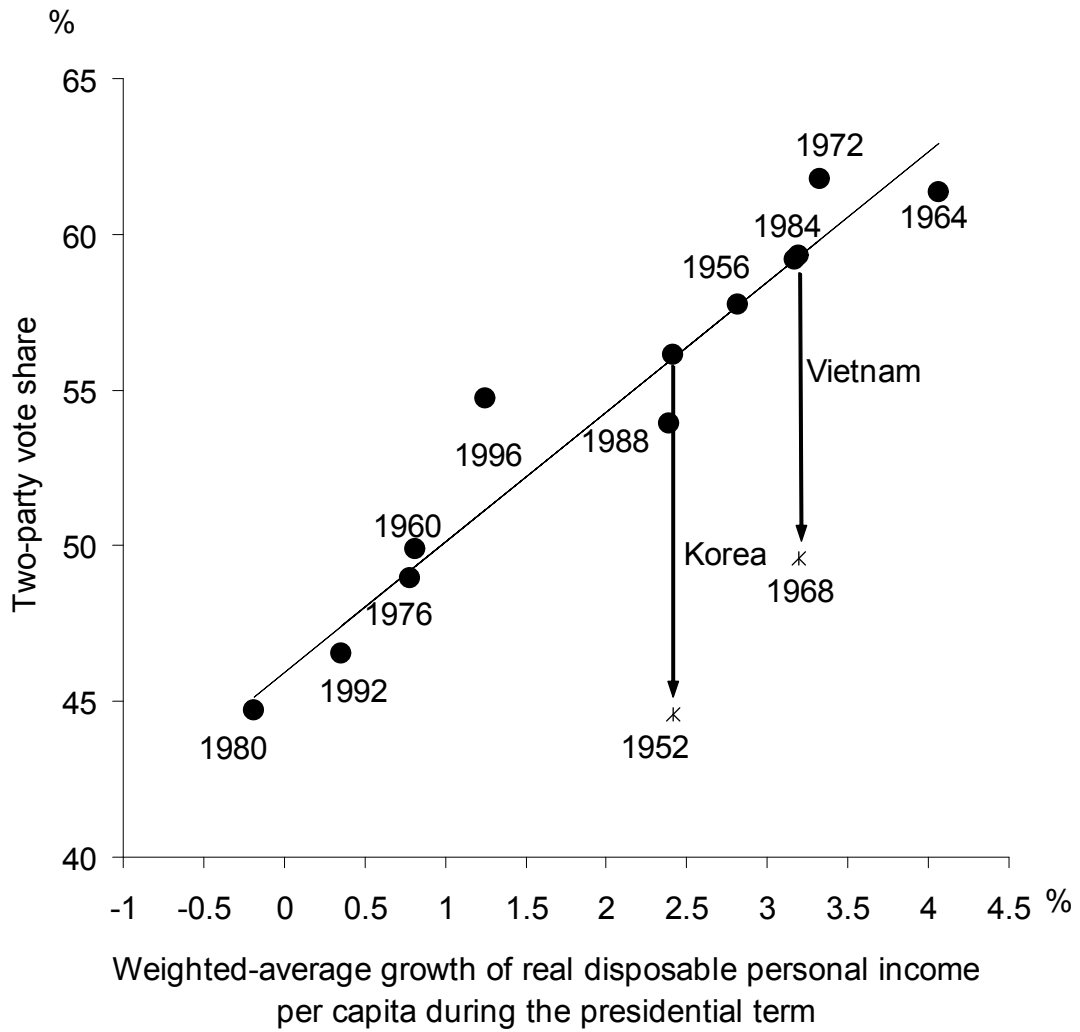Incumbent Party's Presidential Candidate

Figure 1: US Retrospective Voting in the 'Bread and Peace' Model

5 Clarifying Responsibility

Although there is a large body of evidence spanning many countries and several research generations indicating that macroeconomic performance exerts sizeable effects on election outcomes, the connections exhibit considerable instability over time and, especially, space.[28] The failure of research to identify law-like relationships has sometimes been taken to be a generic deficiency of macroeconomic voting models, but this view is mistaken. Rational voters logically will hold government accountable for macroeconomic outcomes that elected authorities have capacity to influence. Such capacity varies in time and space, depending, for example, upon national institutional arrangements, and the exposure of the national economies to external economic forces. This proposition forms the core of the "clarity of responsibility" hypothesis, which first was given sustained empirical attention in Powell and Whitten's (1993) comparative study of economic voting in 19 industrial societies during the period 1969-1988.

The empirical strategy pursued by Powell and Whitten and many who followed,[29] amounts to allowing estimates of macroeconomic effects on voting to vary over subgroups of elections classified by institutional conditions believed to affect the "coherence and control the government can exert over [economic] policy" (Powell and Whitten, (1993:398)).[30] This line of research has delivered persuasive evidence that macroeconomic effects on voting are indeed more pronounced under institutional arrangements clarifying incumbent responsibility – where clarity was taken to vary positively with the presence of single- as opposed to multi-party government, majority as opposed to minority government, high as opposed to low structural cohesion of parties, and the absence of strong bicameral opposition. The contribution to understanding instability of macroeconomic voting – particularly cross-national instability – has been substantial, yet mainly empirical, without reference to an explicit theoretical foundation.

The absence of a theoretical referent is odd because a compelling framework,

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[28]The instability is documented by Paldam (1991). Mueller (2003:Table 19.1) summarizes quantitative estimates of macroeconomic voting effects obtained in many studies.

[29]Examples include Anderson (2000), Hellwig (2001), Lewis-Beck and Nadeau (2000), Nadeau, Niemi and Yoshinaka (2002), Pacek and Radcliff (1995), Taylor (2000), and Whitten and Palmer (1999).

[30]The responsibility thesis per se actually was proposed much earlier by researchers studying associations of voting behavior reported in opinion surveys to respondents' perceptions of personal and national economic developments; for example, Feldman (1982), Fiorina (1981), Hibbing and Alford (1981), and Lewis-Beck (1988). The novel contribution of Powell and Whitten (1993) was to link "responsibility" to variation in domestic institutional arrangements in cross-national investigations of macroeconomic voting. Institutional determinants of economic voting motivated by the responsibility theme subsequently began to appear in a great many papers based on survey data, but this work falls outside the scope of this chapter.

which might have been used to practical advantage in empirical work on instability of economic voting, had emerged during the first part of the 1970 in the unobserved errors-in-variables and latent variables models of Goldberger (1972a, 1972b), Griliches (1974), Jöreskog (1973), Zellner (1970) and others, and those models had been applied to a wide variety of problems in economics, psychology and sociology during the following twenty years.[31] Moreover, the errors-in-variables specification error model was applied directly to the problem of unstable economic voting a full decade before the appearance of Powell and Whitten (1993) in a brilliant paper by Gerald Kramer (1983), which was targeted mainly on the debate launched by Kinder and Kiewiet (1979) concerning the degree to which voting behavior is motivated by personal economic experiences ("egocentric" or "pocketbook" voting),[32] rather than by evaluations of government's management of the national economy ("sociotropic" or "macroeconomic" voting).[33]

Kramer's argument, which subsumed the responsibility hypothesis, was that voters rationally respond to the "politically relevant" component of macroeconomic performance, where, as in the subsequent empirical work of Powell and Whitten and others, political relevance was defined by the policy capacities of elected authorities. Suppose voting is determined by

$$V = \alpha + \sum_{k=1}^{K} \beta_k \, X_k^g + u \qquad u \sim \textit{white-noise} \qquad (25)$$

where without loss of generality I drop time subscripts and abstract from dynamics. The variables determining voting outcomes, X_k^g, denote unobserved, politically relevant components of observed variables, X_k. The observables may be characterized by the errors in variables relations

$$X_k = X_k^g + e_k \qquad E\left(e_k, u\right) = E\left(e_k, X_k^g\right) = 0, \; k = 1, 2, \ldots K \qquad (26)$$

where e_k represent politically irrelevant components, beyond the reach of govern-

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[31]In fact, models with unobserved variables appeared as far back as the 1920s in the pioneering work of Sewell Wright. Goldberger (1972b) gives a warm account of Wright's contributions, which were neglected outside his own domain of agricultural and population genetics until the late 1960s.

[32]This is the traditional *Homo economicus* assumption. In Downs's words "each citizen casts his vote for the party he believes will provide him with more benefits than any other." (1957:36).

[33]As Kinder and Kiewiet put it "The sociotropic voter asks political leaders not 'What have you done for me lately?' but rather 'What have you done for the country lately?' ... sociotropic citizens vote according to the country's pocketbook, not their own." (1979:156, 132)

ment policy.[34] Regression experiments based on observables take the form

$$V = \tilde{\alpha} + \sum_{k=1}^{K} \tilde{\beta}_k \, X_k + \tilde{u} \qquad \tilde{u} = u - \sum_{k=1}^{K} \beta_k \, e_k, \qquad (27)$$

and they suffer from specification error because the true model (25) implies

$$V = \alpha + \sum_{k=1}^{K} \beta_k \, X_k - \sum_{k=1}^{K} \beta_k \, e_k + u. \qquad (28)$$

It follows that least-squares estimation of the misspecified equation (27) yield in the Yule notation

$$
\begin{aligned}
E\left(\tilde{\beta}_1\right) = & \quad \beta_1 \; - \beta_1 b_{e_1,x_1|x_{k\neq1}} - \beta_2 b_{e_2,x_1|x_{k\neq1}} - ... - \beta_K b_{e_K,x_1|x_{k\neq1}} \\
& \quad . \qquad\qquad\qquad\qquad\qquad . \\
& \quad . \qquad\qquad\qquad\qquad\qquad . \\
E\left(\tilde{\beta}_K\right) = & \quad \beta_K \; - \beta_1 b_{e_1,x_K|x_{k\neq K}} - \beta_2 b_{e_2,x_K|x_{k\neq K}} - ... - \beta_K b_{e_K,x_K|x_{k\neq K}}
\end{aligned}
\qquad (29)
$$

where the b's denote partial regression coefficients obtained from (notional) auxiliary multiple regressions of each omitted e_k on $\sum_{k=1}^{K} X_k$.[35] The direction of the biases in principle can go in either direction. In general, however, in this errors-in-variables setting the partial coefficients will satisfy $b_{e_k,x_k|x_{j\neq k}} \simeq b_{e_k,x_k}$ and $b_{e_k,x_j|x_{k\neq j}} \simeq 0$. (Put to words, the partial association of each measurement error e_k, projected on the associated X_k and conditioned on the remaining $X_{j\neq k}$ will generally be nearly equal the corresponding bivariate projection.) It follows that asymptotically

$$\text{plim } \tilde{\beta}_k \quad \simeq \quad \beta_k \; - \beta_k \text{ plim} \left(b_{e_k,x_k}\right) \simeq \beta_k \; - \beta_k \cdot \frac{\sigma_{e_k}^2}{\left(\sigma_{e_k}^2 + \sigma_{x_k^g}^2\right)} \qquad (30)$$

$$\simeq \quad \beta_k \cdot \frac{\sigma_{x_k^g}^2}{\left(\sigma_{e_k}^2 + \sigma_{x_k^g}^2\right)} \simeq \frac{\beta_k}{\left(1 + \frac{\sigma_{e_k}^2}{\sigma_{x_k^g}^2}\right)}, \quad k = 1, 2, ..., K$$

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[34] Kramer did not impose the restriction $E(e_k, X_k^g) = 0$ on the argument that government policies are sometimes designed to offset exogenous shocks to the macroeconomy. I believe a more appropriate view is that shocks to which government does or could respond are incorporated by voters to the politically relevant component X_k^g, leaving e_k as the politically irrelevant residual.

[35] Hence, in the partial b's the first subscript pertains to the omitted measurement error, the second subscript pertains to the included variable associated with the $\tilde{\beta}$ estimate, and the third subscript corresponds to all other included independent ("controlled") variables in the estimated voting equation. The number of terms contributing to the bias equals the number of omitted measurement errors.

where σ^2 and σ denote population variances and standard deviations, respectively. Least-squares regressions therefore deliver estimates asymptotically biased downward in proportion to the reciprocal of the signal to noise ratio. Equations (25)-(30) supply a transparent specification error theoretical framework for interpretation of the instability of macroeconomic voting which has produced so much hand-wringing in the literature.

The implications of equation (30) for "clarity of responsibility" and political relevance are straightforward. One would expect, for example, that the politically relevant fraction of macroeconomic fluctuations would have lesser magnitude in small open economies with high exposure to international economic shocks than in large, structurally more insulated economies. The relevant fraction would logically also be comparatively low in countries in which prior political decisions divest government of important policy capacities; for instance, membership in the European Monetary Union, which deprives national authorities of monetary policy and unfettered deficit finance as instruments of macroeconomic stabilization.[36] The same reasoning implies that politically relevant variance would be low in systems with fractionalized parties and coalition governments, by comparison with two-party systems yielding one-party domination of policy during a typical government's tenure. Such considerations most likely explain why macroeconomic effects on voting outcomes generally are found to be more pronounced and more stable in two-party systems that are relatively insulated from international economic shocks (notably the United States[37]) than elsewhere.

The domestic political-institutional variables featured in the research of Powell and Whitten (1993) and others, along with structural economic variables such as trade openness, domestic product concentration, and terms of trade risk featured in Rodrik's (1998) analysis of international variation in the size of government, appear to make excellent instruments for identifying the impact of politically relevant

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[36]Rodrik (1998) showed that small open economies with high terms of trade risk tend to have comparatively large public sector shares of GDP, and comparatively large scale public financing of social insurance against risk. Hibbs (1993) applied measurement specification error theory to evaluate research on Scandinavian and US economic voting, and conjectured that in big welfare states with weak aggregate demand policy capacities, macroeconomic fluctuations would logically have less impact on electoral outcomes than welfare state spending and policy postures. Pacek and Radcliff (1995) supplied aggregate evidence for 17 developed countries observed over 1960-1987 demonstrating that the effect of real income fluctuations on aggregate voting outcomes in fact declined with the size of the welfare state. Hellwig (2001) presented micro evidence covering nine developed democracies in the late 1990s indicating that economic voting declined with trade openness.

[37]I of course do not mean to suggest that the US is immune to external economic shocks that logically are beyond the control of domestic political authorities. During the post-war period, the OPEC supply shocks of 1973-74 and 1979-81 are probably the most dramatic counter-examples. Hibbs (1987:chapter 5) devised a way to build those shocks into macroeconomic models of political support.

macroeconomic performance on voting outcomes when only gross performance is observed, which is of course always the case in national accounts data. It could be more illuminating, however, to entertain explicit latent structure models of the form

$$\mathbf{X} \;=\; \mathbf{X}^g + \mathbf{e} = \mathbf{Z}\boldsymbol{\gamma}_1 + \left(\mathbf{Z} \cdot \mathbf{X}_{-\tau}\right)\boldsymbol{\gamma}_2 + \mathbf{e} \tag{31}$$

$$V \;=\; \alpha + \mathbf{X}^g\boldsymbol{\beta} + u \tag{32}$$

$$V \;=\; \alpha + \mathbf{X}^g\boldsymbol{\beta} + \left(\mathbf{X} - \mathbf{X}^g\right)\boldsymbol{\theta} + u \tag{33}$$

where $\mathbf{Z}$ represents a matrix of predetermined institutional and structural economic variables of the sort discussed above that are believed to affect political relevance. Equations (31) and (32), or (31) and (33) could be estimated either jointly by a full information maximum-likelihood procedure, or in two-step fashion yielding reduced form voting equations such as[38]

$$V = \alpha + \hat{\mathbf{X}}^g\boldsymbol{\beta} + (\mathbf{X} - \hat{\mathbf{X}}^g)\boldsymbol{\theta} + \tilde{u} \tag{34}$$

where $\hat{\mathbf{X}}^g = \mathbf{Z}\hat{\boldsymbol{\gamma}}_1 + \left(\mathbf{Z} \cdot \mathbf{X}_{-\tau}\right)\hat{\boldsymbol{\gamma}}_2$. Notice that models in the form of (33) and (34) permit direct tests of whether "politically relevant" variation in macroeconomic conditions dominate voting outcomes in the presence of "politically irrelevant" residuals. By comparison to current practice in the "clarity of responsibility" trade, empirical experiments based on test equations such as (31)-(34) hold excellent prospect of enhancing understanding of stability of macroeconomic voting over time and space.

6   Concluding Remarks

Research on voting and the macroeconomy emerged around three generations ago. However, all the way up until the end of the 1960s studies of macroeconomic voting were for the most part a-theoretical, and relied upon rudimentary graphical, tabular and correlational analyses to investigate empirical regularities. The gradual integration of the General Linear Model – the statistical workhorse of social science – into graduate training programs beginning in the late 1950s, along with the appearance of Downs' monumental work in 1957, laid the foundations for econometrically sophisticated, theoretically grounded research. Yet for a decade or more following Kramer's landmark 1971 paper, the lion's share of empirical

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[38]It is not appropriate for me to get into identification and efficient estimation issues here. Pagan (1984) supplies an excellent analysis of various specific setups, including models like (31)-(34). The references cited earlier in this chapter to the econometric work in the 1970s on unobserved variables are also centrally relevant.

studies were based mainly on free-form regressions only tenuously connected to a theory of electoral choice.

During the past dozen years theory, method and knowledge have advanced significantly. The liveliest debates have centered on whether the electorate's valuation horizons are retrospective or prospective, and on the degree to which voters internalize domestic institutional arrangements and international economic forces that constrain the capacity of elected authorities to manage national economies. Research on institutional determinants of clarity of responsibility has exploded over the past decade, but testing formats are commonly ad-hoc regressions populated by various interaction and conditioning variables that are not well motivated either either substantive or econometric theory. The potential leverage offered by unobserved, latent variable models, which were fully developed by the mid-1970s, remains unexploited. Some guidance, or at least commiseration, might be also be found in the analogous efforts to bring institutional factors to bear on measurement of "potential incomes" in neoclassical models of economic growth.[39] Nonetheless, the incorporation of institutional and international constraints to models of economic voting is an important development that is likely to progress steadily and productively.

Rational retrospective voting theory has appealing theoretical coherence, but it has not yet delivered any empirical value added. As matters stand, it gives every sign of going the way of the "surprise" macroeconomics paradigm generally – theoretical elegance devoid of empirical relevance, leading inevitably to abandonment. There is no reason in principle why voters might not apply mixed prospective and retrospective standards of political valuation and electoral choice, but no one has figured out how to implement the combination empirically, aside from studies

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[39]I review a range of such efforts in Hibbs (2001).

based on perceptions about future outcomes obtained from opinion surveys.[40] But such survey data suffer from severe problems of projection and rationalization, and for those reasons are viewed by many with profound skepticism. Devising models that bring forward-looking, competency models to macroeconomic data with statistical power poses one of greatest challenges to future research.

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[40]One can find regressions in the literature that allegedly test forward voting by using actual future outcomes as regressors. Such "perfect foresight" models have no logical foundation, because no one is endowed with perfect foresight; at best voters have rational expectations about the future. Considered at any election period t, rationality of expectations means that regressor(s) X satisfy

$$X_{t+T} = E_t\left(X_{t+T}\right) + e_{t+T}, \qquad e_{t+T} \sim white\text{-}noise,\ E\left[E_t\left(X_{t+T}\right), e_{t+T}\right] = 0$$

and that defensible voting models should be of the form

$$V_t = \beta E_t\left(X_{t+T}\right) + u_t.$$

"Perfect foresight" models like
$$V_t = \beta\left(X_{t+T}\right) + u_t^*$$

are misspecified because a logically admissible model, written in terms of actual future outcomes, implicitly would be

$$V_t = \beta\left[X_{t+T} - e_{t+T}\right] + u_t,$$

that is, $u_t^* = u_t - \beta e_{t+T}$. Clearly u_t^* is negatively correlated with regressors X_{t+T}. Consequently, perfect foresight models deliver estimates of β that are biased toward zero, and that could even have the wrong sign in more elaborate, mixed retrospective-prospective set-ups .

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