Bread and Peace Voting in U.S. Presidential Elections *

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Abstract
A simple "Bread and Peace" model shows that aggregate votes for President in postwar elections were determined entirely by weighted-average growth of real disposable personal income per capita during the incumbent party's term and the cumulative numbers of American military personnel killed in action as a result of U.S. interventions in the Korean and Vietnamese civil wars. The model is subjected to robustness tests against twenty-two variations in functional form inspired by the extensive literature on presidential voting. Not one of these variations adds value to the Bread and Peace model or significantly perturbs its coefficients.

Keywords: US presidential elections; presidential voting; elections and economics; elections and disposable income
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1. The bread and peace model

Postwar American presidential elections should for the most part be viewed as a sequence of referendums on the White House party's economic record. In fact, aside from the 1952 and 1968 contests when U.S. military involvement in the Korean and Vietnamese civil wars, respectively, most likely deprived the Democrats of victory, growth of real disposable personal income per capita during the presidential term accounts, all by itself, for over 90 percent of the variation in aggregate voting outcomes. The remarkably robust association is illustrated by Figure 1 which graphs percentage shares of the two-party vote going to candidates of the incumbent party in relation to weighted-average growth of real disposable personal income per capita, computed from the election quarter back to the first full quarter of each presidential term.

Growth of real disposable personal income per capita is probably the broadest single aggregate measure of changes in voters' economic well-being, in as much as it includes income from all market sources, is adjusted for inflation, taxes, government transfer payments and population growth, and tends to move with changes in unemployment.[1] For these reasons it is not surprising that it is a good single-variable election predictor. What perhaps is surprising, however, is that no other variable appearing in the extensive literature on economic voting adds *anything* statistically to the explanation of aggregate presidential election outcomes when conditioned on weighted-average growth of per capita real disposable personal income and

[1] An Okun's law type regression (to be interpreted as associational not structural) of annualized, quarter on quarter per capita real personal disposable income growth rates ($\Delta \ln R$, as defined precisely ahead) on quarter to quarter changes in the rate of unemployment (U) over 1949:1-1996:4 yields (with t-ratios in parentheses):

$$\Delta \ln R_t = \underset{(6.4)}{1.89} - \underset{(5.9)}{4.1}\left(U_t - U_{t-1}\right); \quad \bar{R}^2 = .15, \quad DW = 2.1.$$

The estimated quarterly Okun multiplier is smaller and the relationship is much noisier than what is obtained in a more conventional projection of unemployment changes on quarter to quarter growth of real GDP per capita, reflecting the effectiveness of policies designed to stabilize personal incomes over the business cycle:

$$\Delta \ln GDP_t = \underset{(9.5)}{2.06} - \underset{(14.3)}{7.4}\left(U_t - U_{t-1}\right); \quad \bar{R}^2 = .52, \quad DW = 2.1.$$

cumulative numbers of American military personnel killed-in-action in Korea and Vietnam.[2] Much of this paper is devoted to establishing this assertion.

The Bread and Peace equation generating the data depicted in the Figure is:

$$Vote_t = \beta_0 + \beta_1 \left(\sum_{j=0}^{14} \lambda^j \Delta \ln R_{t-j} \left(1 \Big/ \sum_{j=0}^{14} \lambda^j \right) \right) + \beta_2 CUM\ KIA_t \qquad (1)$$

where

Vote is the incumbent party's percentage share of the aggregate two-party presidential vote,

R is per capita disposable personal income (seasonally adjusted at annual rates) deflated by the Consumer Price Index, and $\Delta \ln R_t$ is the annualized quarter on quarter percentage rate of growth, $\Delta \ln R_t = \ln\left(R_t \Big/ R_{t-1} \right) \cdot 400$ [3],

$\left(1 \Big/ \sum_{j=0}^{14} \lambda^j \right)$ is just a normalizing constant, so that β_1 registers the response of *Vote* to movements in the weighted-average of real income growth rates,

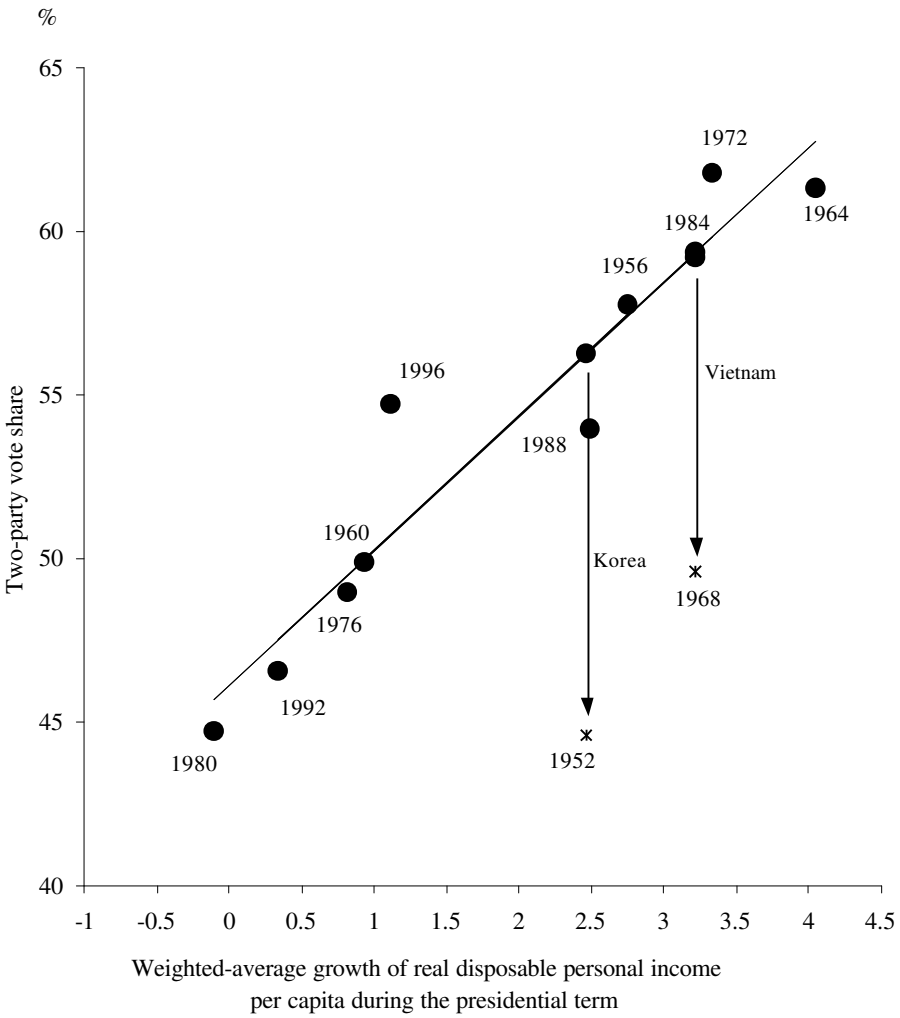
CUM KIA is the cumulative number of American military personnel killed-in-action (in 1000s) in the Korean and Vietnamese civil wars during the presidential terms preceding the elections of 1952, 1964, 1968 and 1976, and

- $\beta_0 = 46.1, \beta_1 = 4.12, \lambda = 0.954, \beta_2 = -0.369$.

[2] I exclude from this statement poll data on voting intentions, candidate preferences and analogous variables (which I have not investigated) because such variables supply no behavioral explanation of voting outcomes.

[3] Given November election dates, election quarter growth rates are computed $\Delta \ln R_t = \ln\left[\left(R_t \Big/ R_{t-1} \right)^{1/3} \right] \cdot 400$; all others are computed as indicated. This weighting of the election quarter (which is incorporated to the weight sum normalization), as well as the exclusion of the first quarter (which of course begins prior to inaugurations), have only minor impact on all results reported.

Figure 1. Real Income Growth and the Two-Party Vote Share of the Incumbent Party's Presidential Candidate



Nonlinear least-squares estimation of the equation over 1952 to 1996 (twelve presidential elections)[4] yields the results shown in row 1 of Table 1 (the "benchmark" regression). The parameter estimate for $\Delta \ln R$ in the benchmark model implies that each percentage point of per capita real disposable personal income growth sustained over the term of office yields a 4 percentage point deviation of the incumbent party's vote share from a constant of 46 percent. Hence, absent Americans being killed-in-action in wars like Korea and Vietnam (CUM KIA), the incumbent party becomes increasingly more likely to win the presidential election as weighted-average real income growth performance exceeds a break-even rate of 1.0 percent – which is only a little more than half the 1949 to 1996 mean growth rate of 1.9 percent. At real income growth rates equal to the mean, the model predicts an incumbent Vote share of about 54 percent, which is more than 2 standard errors above the break-even 50 percent mark and so is well within the range of highly likely victory. The equation therefore implies a bias favoring the incumbent party. As voters have more recent information about the party in power than about the opposition, this implication may be rationalized by risk-aversion.[5] (See Quattrone and Tversky, 1988).

Unlike the set-up of economic voting models that assume only the election year (or half year) economic record matters,[6] a weighting parameter estimate as high as 0.95 means that election outcomes are influenced by real income growth over the whole term. In fact, the hypothesis $\lambda = 1$ cannot be rejected at conventional test levels (the p-value is 0.23). The hypothesis of flat or uniform weighting under which voting responds to a simple arithmetic average of over-the-term real income growth rates is therefore not implausible. Evidently there is little scope for Nordhaus-style political business cycles from the aggregate vote-side of the macro political economy. (Nordhaus, 1975) A fairly uniform weighting of income growth rates gives

[4] Studies like this one frequently include the 1948 election. I omit it not so much because the quarterly National Income and Product Accounts accountsbegin in 1947 (and the Bread and Peace model requires quarterly disposable income data over the whole administrative term) but mainly because the transition from a total war economy after the defeat of Japan renders the meaning of the measured economy during demobilization wholly incomparable to the rest of the postwar period.

[5] This bias is not enhanced, however, when an incumbent candidate is running. I established this in an experiment not reported in which an incumbent candidate binary variable was added to the basic Bread and Peace setup.

incumbents little incentive to 'back load' whatever influence they might exert on real income growth. Voting outcomes under the Bread and Peace model therefore reveal rather little voter myopia by the standards of the literature. A weighting parameter close to 1.0 (a backward-looking discount rate close to 0.0) also has implications for the rationality of backward-looking or pure retrospective voting. I pursue this issue in the next section.

The CUM KIA coefficient registers the incumbent party vote losses caused by the two most important non-economic events affecting postwar presidential elections: the American interventions in the Korean and Vietnamese civil wars. Congress never legitimated American engagement in either conflict with a formal declaration of war. And both wars ultimately became extremely unpopular, prompting sitting Democratic Presidents, who otherwise had excellent reelection prospects because they presided over favorable economic conditions (Harry Truman and Lyndon Johnson), to decide against seeking another term.

Previous studies of domestic political aspects of the American military involvement in Korea and Vietnam[7] deliver two conclusions that guided my investigation of war effects on presidential voting outcomes: (i) Declining political support for the wars per se, as well as war-induced deterioration of presidential approval ratings in the polls, are best explained by cumulative growth of American casualties, particularly cumulative numbers of American military personnel killed-in-action, and (ii) The political costs were born primarily by the party initiating American participation (the "war party"; in both cases the Democrats). The results I obtained are consistent with these conclusions. The vote losses associated with Korea and Vietnam are best tracked by the cumulative numbers of American military personnel killed-in-action (*CUM KIA*) during each four year term preceding the elections of 1952, 1964, 1968 and 1976. (See Appendix 1, Calibration of the election effects of American military participation in the Korean and Vietnamese civil wars.)

[6] Consequently, such models tend to predict badly presidential voting outcomes when early- and late-term performance differ substantially as, for example, at the 1976 and 1992 elections.

[7] The most comprehensive study of the evolution of public opinion on American involvements in Korea and Vietnam is Mueller (1973). Effects of Korea and Vietnam on presidential approval ratings are investigated quantitatively by Ostrom and Simon (1985). Cotton (1986) supplies a more qualitative assessment of electoral consequences of wars.

The coefficient for *CUM KIA* shows that Korea and Vietnam were huge liabilities for the incumbent Democrats. Cumulative numbers of Americans killed-in-action (in 1000s) at the 1952 and 1968 election dates were 29.3 and 28.9, respectively, which given a parameter estimate of -0.37 implies that the vote shares for Adlai Stevenson and Hubert Humphrey were depressed by nearly eleven percentage points apiece.[8] Estimated effects of Korea and Vietnam are illustrated in Figure 1 by the vertical arrows running from the vote shares expected from economic performance alone to the actual 1952 and 1968 outcomes. The estimates indicate that had Stevenson not been burdened by the toll of Americans killed-in-action following Harry Truman's decision to commit American troops to the defense of South Korea, he probably would have defeated Dwight Eisenhower handily in 1952. And real disposable income growth rate performance was so favorable during 1965-68 that Humphrey almost surely would have trounced Richard Nixon had he not been saddled by the decisions of John Kennedy and Lyndon Johnson to commit American troops to the defense of the South Vietnam.[9] Indeed had there been no American involvement in the Vietnamese civil war, Johnson rather than Humphrey no doubt would have been the Democratic party's candidate in 1968. These historical precedents help explain why the Clinton Administration was so reluctant to put the lives of American military

[8] At the 1964 and 1976 elections CUM KIA were only 0.218 and 0.414, respectively, and so war effects on *Vote* were negligible. Nixon inherited Vietnam from Johnson, and 1972 effects were found to be nil. Hence, very little would change if one just used a War dummy variable for the 1952 and 1968 elections, which was the approach used in an earlier version of this paper. The near equivalence of effects at the 1952 and 1968 elections is consistent with results obtained in related studies. Ostrom and Simon (1985) found that cumulative killed-in-action had negative effects of almost identical magnitude on Gallup poll job approval ratings for Truman and Johnson (18 percentage points). Mueller (1973) found cumulative casualties to have identical effects on poll readings of public support for American involvement in Korea and Vietnam.

[9] Under the Bread and Peace model, the penalty exacted by Vietnam (and Korea) on the incumbent party candidate(s) had little (strictly speaking, nothing) to do with the respective war policy positions of the major party contestants. As Page and Brody (1972) document in their 1968 survey-based analysis, there was no appreciable difference between the Vietnam postures of Humphrey and Nixon, either as perceived by voters or as registered by calibrations of the candidates' (rationally vague) pronouncements and promises. Hence there was little or no relationship between voters' opinions on the war and their electoral choices. This leads Page and Brody to the erroneous conclusion that the biggest issue in the 1968 election (and one of the most important non-economic issues in all postwar American politics) had little or no influence on the 1968 presidential election result: "even if Vietnam policy was extremely important to them [voters], they had to ignore the issue and vote on other grounds." (Page and Brody, 1972, p. 984). This misjudgment of the efficiency of the electoral system reveals, among other things, the poverty of single-election survey studies as a tool for identifying the sources of voting outcomes.

personnel at significant risk during NATO's intervention in the Serbia-Kosovo conflict.

The second row of Table 1 reports a regression experiment that omits the CUM KIA variable. This specification is essentially the same as that used in Hibbs (1982) where I discovered the statistical power of applying geometric lag weighting to disposable income growth rates in order to fit presidential election outcomes from 1952 to 1980.[10] My 1982 paper reported a weighted-average real disposable income effect on presidential vote shares of about 3 and a lag-weight parameter estimate of 0.8; similar to the estimates in Table 1, row 2 for a comparably misspecified equation. Cumulating real disposable personal income growth rates over the term by imposing the weighting parameter estimate of 0.8 obtained in Hibbs (1982) has been adopted in subsequent research, evidently without re-estimation of the lag structure (see, for example, Erikson, 1989; Erikson and Wlezien, 1996). Keech describes application of economic lag sequences based on a geometric weighting parameter of 0.8 as "the standard that has become widely accepted". (1995, p. 137) If this be so, the regressions in Table 1 indicate that such a standard is misguided, at least insofar as US presidential voting is concerned.

It seems clear from Figure 1 that the benchmark estimates for the Bread and Peace model are stable in all time-regions of the postwar sample. Regressions 3, 4 and 5 in Table 1 confirm this for samples omitting the 1952 and 1968 "war" elections, and for samples confined to the first 8 and the last 7 presidential elections. The parameter equivalence statistics show that it is impossible to reject at any sensible test level the null hypotheses of equality between coefficients obtained in the full sample benchmark regression and estimated coefficients in these (as well as other) time-wise variations of the observation regime.

[10] This paper was intended mainly to supply evidence for the idea that Ronald Reagan's substantial victory in 1980 had less to do with a big "shift to the right" in the electorate's basic preferences (a common interpretation at the time) than with poor macroeconomic performance during the Carter Administration. Hibbs (1987), chapter 6 pursues the issue further.

Table 1. Bread and peace model regressions: Benchmark estimates and time-wise stability (presidential elections 1952-1996)

Model: $Vote_t = \beta_0 + \beta_1 \left(\sum_{j=0}^{14} \lambda^j \Delta \ln R_{t-j} \left(1 \Big/ \sum_{j=0}^{14} \lambda^j \right) \right) + \beta_2 CUM\ KIA_t$

	β_0	β_2	λ	λ	$\bar{R}^2$	SEE
1. Benchmark model, Eq. 1 (1952-1996)	**46.1 (42.2 /. 00)**	**4.1 (7.4 / .00)**	**0.95 (26.9 / .00)**	**-0.37 (-5.5 / .00)**	**.90**	**1.97**
2. Omitting the CUM KIA term	46.3 (20.8/.000	2.86 (2.9/0.01)	0.82 (6.0/.00)		.54	6.24
					Signif. level for equivalence of $\hat{\beta}_0$, $\hat{\beta}_1$, $\hat{\beta}_2$, $\hat{\lambda}$ *to benchmark estimates in row 1*:	
3. Non-war elections (omitting 1952, 68)	46.2 (40.0 / .00)	4.1 (6.8 / .00)	0.95 (24.7 / .00)	NA	.999	
4. First 8 elections (1952-1980)	46.7 (47.8 / .00)	4.3 (9.3 / .00)	0.94 (31.2 / .00)	-0.36 (-7.4 / .00)	.953	
5. Last 7 elections (1972-1996)	45.9 (27.7 / .00)	4.4 (4.5 / .01)	0.96 (20.8 / .00)	NA	.991	

Notes: In parentheses (t-ratio / significance level); Election quarter growth rates are computed $\Delta \ln R_t = \ln\left[\left(R_t / R_{t-1}\right)^{1/3}\right] \cdot 400$; all others computed $\ln\left(R_t / R_{t-1}\right) \cdot 400$ as indicated earlier.

2. Theoretical rationalization of the model

2.1 Stochastic properties of real disposable personal income per capita

What one makes theoretically of the strong connection between aggregate real income growth and voting outcomesfeatured in the Bread and Peace model depends partly on the stochastic properties of the disposable incomes and on how income realizations affect valuation of the parties and electoral choice. We know that variables like log output, log real labor income, and log real consumption are very well approximated by random walks with drift. Below I confirm this to be true also of log real disposable personal income per capita. (See also Mankiw and Shapiro, 1985.) Standard test equations are

$$\ln R_t = \alpha + \delta t + \rho \ln R_{t-1} + r_t \qquad (2)$$

$$\ln R_t = \alpha + \rho \ln R_{t-1} + r_t \qquad (3)$$

Table 2 reports regressions for 400 times the log of real disposable personal income per capita ($\ln R$). Results for Eq. (2) in row 1 of the Table show that the joint hypothesis $\delta = 0, \rho = 1$ cannot be rejected by the Dickey-Fuller test based on the OLS F statistic. Estimates for Eq. (3) in row 2 indicate that the single-parameter null of $\rho = 1$ also cannot be rejected at usual test levels, supplying additional evidence that $\ln R$ obeys a random walk with drift, perturbed by random shocks which are serially uncorrelated globally according to the Box-Pierce Q test and other residual diagnostics.[11] The implication is that quarter-to-quarter changes in log real disposable personal income per capita ($\Delta \ln R$) are unforecastable, apart from an annualized drift rate (α) of about 1.9 percent per quarter (Table 2, row 3). It follows that realizations of $\Delta \ln R$ deviated from α may to a good first approximation be interpreted as "news" in real disposable income growth rates (r_t) that are permanently embodied in future real income stocks $\ln R$.

[11] Other tests deliver the same conclusion; for example, the test equation (standard errors in parentheses):

$$\Delta \ln R_t = \underset{(56.8)}{62.3} + \underset{(0.07)}{0.06} \ln R_{t-1} + \underset{(0.03)}{0.028}\ trend \qquad \bar{R}^2 = .004, \quad Box\text{-}Pierce\ Q \text{ si } gnif.\ level = .61 .$$

Table 2. Stochastic properties of log real disposable personal income per capita (1949:1 – 1996:4)

	α	δ	ρ	$\bar{R}^2$	Box-Pierce Q signif. level
	Model: $\ln R_t = \alpha + \delta\ trend + \rho \ln R_{t-1} + r_t$				
1.	54.5	0.023	0.985	.999	.51
	(1.0 / .33)	(0.67 / .50)	(60.1 / .00)		
	F test of $\delta = 0, \rho = 1$ equals 1.46 with significance level .90				
2.	17.4		0.996	.999	.25
	(1.7 /.08)		(368 / .00)		
	F test of $\rho = 1$ equals 2.5 with significance level .12				
	Model: $\ln R_t = \ln R_{t-1} + \alpha + r_t, \quad \Delta \ln R_t = \alpha + r_t$				
3.	1.90				.49
	(6.1 / .00)				

Notes: In parentheses (t-ratio / significance level); 1959:1, the first period of the revised chain-linked NIPA data, is omitted.

Table 3 supplies additional evidence that log real disposable income per capita growth rates are unforecastable. Regressions 1 and 2 show that runs of good and bad news have no systematic relationship to the party of the President. If this was not the case, an electorate motivated by real income performance would be endowed *ex-ante* with valuable information about the economic competence of presidential election contestants. It follows that elections would likely be less competitive intertemporally then they appear to have been from the historical record, with outcomes being biased in favor of the more competent party's candidates. The results in regressions 3 and 4 indicate that performances turned in by incumbent parties or incumbent Presidents

also yield no useful information about likely growth rate deviations from drift during terms just following their re-election. Parties or Presidents with successful enough real income growth rate records to secure re-election have not delivered second term records (or, in the case of parties, third term records) departing significantly from the ex-ante expected value of news equal to zero.[12]

Table 3. presidential terms and per capita real disposable personal income growth rate "news" (1949:1 – 1996:4)

Models: $\left(\Delta \ln R_t - \alpha\right) \equiv r_t$, $\quad r_t = C + Political\ Periods_{t-1}$

	C	Democratic terms	Republican terms	Terms following party re-elections	Terms following President re-elections
1.	-0.165	0.397			
	(-0.40 / .68)	(0.63 / .53)			
2.		0.231	-0.165	F test of [Dem(.23)-Rep(-.17)]	
		(0.48 / .63)	(-0.40 / .67)	= 0 is 0.4 with signif. level .53	
3.	0.387			-0.930	
	(0.95 / .34)			(-1.5 / .14)	
4.	0.045				-0.268
	(0.13 / .90)				(-0.32 / .75)

Notes: In parentheses (t-ratio / significance level); 1959:1, the first period of the revised chain-linked NIPA data, is omitted.

[12] It is worth noting that the test for re-elected Presidents in regression 4 is based only on the contrast of second-term outcomes under Eisenhower and Regan with all other periods.

2.2 The rationality of pure retrospective voting

In view of the stochastic properties of log real disposable personal income per capita established in Tables 2 and 3, a natural interpretation of the Bread and Peace model is that voters reward or punish the incumbent party for permanent changes to their economic wellbeing, calibrated *ex-post* at election periods in terms of comparatively good or bad runs of real income growth rate news that are only modestly discounted (and perhaps not discounted at all) over the administrative term.[13] [14] In the wake of the rational expectations revolution in economic theory (and beyond) with its strong and sometimes compelling emphasis on forward looking behavior, many have come to interpret such pure retrospective voting as "naïve". This interpretation is misguided.

As Ferejohn (1986) and Pelzman (1990) have argued, the electorate can be seen as standing in principal-agent relation to the incumbent party. Voters settle up with their agent, here the party of the President, by retrospective or *ex-post* evaluation of performance for much the same reason – moral hazard – that insurance premia are

[13] Under the pure retrospective voting of the Bread and Peace model, whether voters respond to the over-the-term history of "news" or to the history of growth rate performance per se, is of no practical importance. The two interpretations are observationally equivalent *given* the stochastic properties of $\Delta \ln R$. Estimates for Eq. 1 differ from the same Bread and Peace equation using growth rate news [$r_t \equiv (\Delta \ln R_t - \alpha)$] in place of actual growth rates as the income regressor only in the scale of the constant, β_0. In the later case the estimated constant would equal $\hat{\beta}_0 + \hat{\beta}_1 \hat{\alpha} = \hat{\beta}_0 + 7.8 \approx 54$ percent of the two-party vote. Note that at expected value of news equal to 0, this implies a bias favoring the incumbent party ("the devil you know"). Hence the implication of the Bread and Peace estimates pointed out in section 1: The incumbent party need only deliver a weighted average real income growth rate of around 1.0 percent - which is less than the drift rate (α) of 1.9 percent - to cross the vote share break-even point of 50 percent.

[14] The idea that rational retrospective voting implies low (or no) discounting of performance over the incumbent's term of office was to my knowledge first advanced by George Stigler (1973) in his critique of Gerald Kramer's (1971) path breaking analysis of macroeconomic influences on Congressional voting outcomes. Stigler argued that to the extent prosperity affects election outcomes, the electorate's evaluation horizon should span the entire term of office (and maybe several terms of office), not just the election year as Kramer had postulated on the argument that the best guide to the future is the most recent past. As far as I can tell Stigler is also the first to argue that voters should logically respond to deviations of "permanent" income from the normal ("average" or "trend") rate of change, an insight which corresponds precisely to the 'news' interpretation of real disposable income changes in the Bread and Peace model. (Although a rougher formulation of this idea, like so many other others in economics and politics, can be found in Downs, 1957.) Stigler, however, found that macroeconomic outcomes exerted little or no effects in Kramer's setups when the economy was computed over the entire Congressional term, and not just the election year. He reasoned that prosperity was not a contentious issue and conjectured that the basis for partisan competition was largely distributional. I test for income distribution effects on presidential voting in the next section.

typically experience-rated or that compensation of top corporate executives is heavily dependent on past profitability of the firm. Under pure retrospective electoral valuation, promises to do better in the future are discounted completely and exert no significant influence on voting choice. Instead, retrospective theory emphasizes the efficiency of inducing governing parties (and their officials in office) always to do their best in certain knowledge that voting settlements will be calibrated from observed outcomes over the term, no matter how attractive (inherently unenforceable) commitments about future improvements to performance may appear to be. 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, p.61) Under this interpretation of the rationality of pure ex-post retrospective voting, bygones are never bygones (as they would be under a pure forward looking orientation), but rather form the main engine of voters' electoral valuations and parties' electoral successes.[15]

This view of retrospective political evaluation contrasts sharply with the forward view of voting, which is more akin to the fundamentalist theory of asset prices: Current asset values (the parties' stock of votes at elections) are driven by the present discounted value of expected future pay-offs. Pure retrospective economic voting also rejects so-called "rational retrospective" theories which assert that only post-election consequences of within-term performance should affect current voting outcomes. (See, for example, Alesina, Londregan and Rosenthal, 1993 and Alesina and Rosenthal, 1995, who find, however, no empirical support for this conception of rational retrospective theory.) If within-term realizations $\Delta \ln R$ are the main economic determinant of votes for President as maintained by the Bread and Peace model, and if voters respond only to cumulative news about real income growth rates, then rational retrospective voting is ruled out immediately because news (by definition) is unforecastable. If voters respond instead to predictable future real disposable income growth as opposed just to growth rate news, then forward-looking voting (which in this case would not be 'rational' in the usual forward sense) still fails

[15] Fiorina (1981) supplies a monograph-length analysis of the history, mechanics and survey based

when log per capita real disposable personal income evolves as a random walk plus drift. The lack of consistency of this forward view with the evidence is particularly stark when the weights placed upon pre-election growth rates are anywhere near as high as those implied by the estimates of the lag weight parameter λ in Table 1.[16]

2.3 Individual electoral choice and aggregate vote shares

In order to motivate aggregation I assume that voters perceive government policy action and competence as having small effect on cross-sectional income dispersion by comparison to the political signal carried by cyclical variations of mean incomes. Under this assumption (which I relax in one of the regression experiments in the next section) voters are rationally "sociotropic" and appraise the incumbent party by focusing on the time path of mean real personal disposable incomes, R_t. (See Kramer, 1983 and Hibbs, 1993, sections V-IX)

Voters also understand the stochastic structure of real income realizations, $\ln R_t = \alpha + \ln R_{t-1} + r_t$, and reward or punish their incumbent agent at elections by evaluating innovations r_t that represent permanent proportional changes to the time path of mean real disposable personal incomes:

$$\left(\Delta \ln R_t - E\left(\Delta \ln R_t\right)\right) = r_t = \left(\Delta \ln R_t - \alpha\right).^{17\ 18}$$

As already noted, the incentive structure of pure retrospective voting implies further that growth rate news is evaluated over the whole term of office with low (or no)

evidence on retrospective voting in the United States.

[16] At election dates $t = T$, the rational expectation of post-election real income stocks and growth rates would be $E_T\left(\ln R_{T+\tau}\right) = \ln R_T + \tau\alpha$, $E_T\left(\Delta \ln R_{T+\tau}\right) = \alpha$, $\tau = 1, 2, \ldots$ Events prior to elections therefore might be informative ex-ante only about potential shifts in the drift rate affecting post-election growth. But we see no evidence of predictable shifts in α from Tables 2 and 3, as already pointed out in the main text.

[17] Note that by Jensen's inequality $\ln R_t \equiv \ln\left(E_t R_{it}\right) \geq E_t\left(\ln R_{it}\right)$, where subscript i denotes voters. It follows that $\Delta \ln R_t = \Delta E_t\left(\ln R_{it}\right) + \delta_t$, where δ_t is $\left\{\Delta \ln R_t - \Delta E_t\left(\ln R_{it}\right)\right\}$ which increases with positive changes in income dispersion. (For example, if incomes are log normally distributed, $\ln R_t = E_t\left(\ln R_{it}\right) + 1/2\,\sigma_t^2\left(\ln R_i\right)$.) $\Delta \ln R_t$ therefore exceeds $\Delta\left[E_t\left(\ln R_{it}\right)\right]$ when inequality of distribution increases, and conversely.

[18] A firm believer in the permanent income hypothesis might use changes in consumption to calibrate news in changes to permanent disposable incomes. (See, for example, Pelzman, 1990.)

backward discounting. I take all parameters to be common across voters and therefore arrive at an income growth evaluation term of the form introduced in Eq. (1):

$$\beta_1 \sum_{j=0}^{J} \lambda^{j} r_{t-j} \Big/ \sum_{j=0}^{J} \lambda^{j} = \beta_0 + \beta_1 \sum_{j=0}^{J} \lambda^{j} \Delta R_{t-j} \Big/ \sum_{j=0}^{J} \lambda^{j} \qquad (4)$$

where $\lambda \approx 1$ and J is the over-the-term evaluation period.

Let $g(X_t)$ designate the systematic factors affecting evaluations of incumbent performance; namely over-the-term realizations of ΔR news and CUM KIA as maintained by the Bread and Peace model. Unobserved voter propensities to support the candidate of the incumbent party are indexed by V_{it}^{*} and are determined stochastically by

$$V_{it}^{*} = g(X_t) - \varepsilon_{it}, \qquad (5)$$

where ε_{it} are random events at each election that disadvantage the incumbent party and are unknowable ex ante. It follows that voting choices are probabilistic:

$$V_{it} = \begin{cases} 1 & if \;\; V_{it}^{*} = g(X_t) - \varepsilon_{it} \;\; \geq X^{S} \\ 0 & if \;\; V_{it}^{*} = g(X_t) - \varepsilon_{it} \;\; < X^{S} \end{cases} \qquad (6)$$

$$\begin{aligned} \text{Prob}(V_{it} = 1) &= \text{Prob}\left(g(X_t) - X^{S}\right) \geq \varepsilon_{it} \\ &= \text{Prob}\left(\varepsilon_{it} \leq \left(g(X_t) - X^{S}\right)\right) \\ &= F\left(g(X_t) - X^{S}\right) \end{aligned} \qquad (7)$$

where $V_{it} = 1$ is a vote for the incumbent party candidate by voter i at election date t,[19] X^{S} is an exogenous fixed performance standard, and F is the cumulative distribution function of random events ε over voters i at any election. Notice that under the pure retrospective decision rule the systematic source of voting choices is

[19] As before, minor party choices (on several occasions non-trivial in the postwar period) are normalized away by specification of V in terms of major party choices.

the incumbent party's performance relative to a given standard, X^S. The opposition party's role is merely to be available as a replacement in the event that incumbent party performance is inadequate under the choice mechanism of (6)-(7).

Generally speaking a plausible assumption is that the ε_{it} are drawn from some bell shaped distribution with F being, say, the cumulative normal or the cumulative logistic. Over the relevant range of aggregate voting outcomes, however, these distribution functions are quite flat (incumbent percentage vote shares vary between 44.6 and 61.8 in the postwar sample period). Hence assuming a uniform (rectangular) distribution of random events does no important injustice to the aggregate empirics and it yields functional forms permitting ready comparison of my regression experiments to the vast literature on aggregate economic voting in which the regressand is nearly always a vote share. Accordingly let ε_{it} be evenly distributed over voters between $-k + \bar{\varepsilon}_t$ and $k + \bar{\varepsilon}_t$, where k is a positive constant and $\bar{\varepsilon}_t$ is the conditional mean of ε_{it} at election date t.[20] At each election realizations of ε_{it} therefore have probability density $f_t(\varepsilon) = 1/2k$ and cumulative distribution $F_t(\varepsilon) = (\varepsilon_{it} - (-k + \bar{\varepsilon}_t))/2k$.

In view of (7), uniformly distributed random events implies the linear vote probability function

$$\text{Prob}(V_{it} = 1) = \frac{k + g(X_t) - X^S - \bar{\varepsilon}_t}{2k} . \qquad (8)$$

Using (4) and aggregating over voters i to find $\frac{1}{N}\sum_{i=1}^{N} V_{it} = V_t$, yields:

[20] Hence random events may (and, in fact, are likely to) favor incumbent or opposition parties at any given election; in general the conditional mean $E_t(\varepsilon_{it}) \equiv \bar{\varepsilon}_t \neq 0$. However over all elections the unconditional mean is assumed to obey $E(\bar{\varepsilon}_t) = E(\varepsilon_{it}) = 0$ which motivates the usual least squares disturbance assumption. Group specific biases could easily be accommodated by permitting group variations in $\bar{\varepsilon}_t$ or X^S, but there would be no gain to modeling aggregate election results.

$$V_t = \frac{1}{2} - \frac{\left(\beta_0' + X^S\right)}{2k} + \frac{\beta_1'\left(\sum_{j=0}^{14} \lambda^j \Delta \ln R_{t-j}\left(1 \Big/ \sum_{j=0}^{14} \lambda^j\right)\right)}{2k} + \frac{\beta_2' CUM\ KIA_t}{2k} - \frac{\bar{\varepsilon}_t}{2k} \quad (9)$$

We obtain the Bread and Peace Model of (1) after writing the left-side of (9) as the incumbent party's percentage vote share,

$$Vote_t = \beta_0 + \beta_1\left(\sum_{j=0}^{14} \lambda^j \Delta \ln R_{t-j}\left(1 \Big/ \sum_{j=0}^{14} \lambda^j\right)\right) + \beta_2 CUM\ KIA_t + v_t \quad (1.1')$$

where $Vote_t = 100 \cdot V_t$, $\beta_0 = 100 \cdot \left(\frac{1}{2} - \frac{\left(\beta_0' + X^S\right)}{2k}\right)$, $\beta_1 = 100 \cdot \frac{\beta_1'}{2k}$, $\beta_2 = 100 \cdot \frac{\beta_2'}{2k}$

and $v_t = -100\ \frac{\bar{\varepsilon}_t}{2k}$.

3. Robustness of the model

I now investigate the robustness of benchmark estimates for the Bread and Peace model to a sequence of twenty-two additional variables (or sets of variables) appearing in the voluminous literature on presidential voting. Results of these regression experiments are reported in Table 4. The second column of each row reports parameter estimates, t-ratios and significance levels ("p-values") for the additional test variable(s). The third column gives the significance level for the null hypothesis of parameter equivalence between the Bread and Peace Model coefficients obtained for each test equation and the corresponding Bread and Peace estimates for the benchmark regression in Table 1, row 1.

3.1 Old news

Absent U.S. involvement in undeclared wars, the Bread and Peace model assumes elections are affected only by permanent innovations to real income realized during

the incumbent party's most recent term. In this sense retrospective evaluation of ex-post 'settling up' are horizon-bounded. The first regression experiment in Table 4 tests the proposition that ex-post evaluation extends further back than the most recent term by including the vote share received by the current incumbent party at the previous election. The idea is that the lagged incumbent vote share incorporates "old news", summarizing the present relevance of performance outcomes during earlier terms. As shown in row 1 of Table 4, performance prior to the most recent term does not spill over to current votes for President. The coefficient estimate for the incumbent party's vote share at the previous election is essentially zero, and estimates of the Bread And Peace model parameters obtained under this variation of functional form are nearly identical to those in the benchmark regression. Rounded from the third decimal place, the p-value for the hypothesis of joint parameter equivalence is 1.0.

3.2 Inflation and unemployment

Test regressions 2 to 5 estimate the conditional effects of macroeconomic variables that feature prominently in the presidential voting literature. I find that the inflation rate, the unemployment rate and changes in the unemployment rate have no influence on election outcomes when conditioned on the Bread and Peace equation.[21] I also estimate the impact of inflation surprises, on the argument that unexpected price changes are costly economically and, hence, politically. Expected inflation is calibrated from poll data on "the expected change in prices over the next twelve months" obtained by the University of Michigan's Surveys of Consumers. Inflation surprises are deviations of expected inflation in the surveys at each quarter from the corresponding observed rate of change of the Consumer Price Index[22]. Statistics for this experiment in test regression 3 imply that unexpected inflation has no effect on

[21] The same conclusion holds for the absolute value of inflation (worth testing since voters may be as hostile to deflation as inflation).

[22] In this equation, and in many other test equations reported ahead, the results pertain to models imposing a common lag weighting parameter λ on $\Delta \ln R$ and the test variable(s). In every relevant case, however, a parallel experiment was undertaken in which the weighting parameter was permitted to vary. The outcomes of these experiments in no case differed in any important way from results reported in Table 4.

voting outcomes.[23] And here, as in the other test regressions, the variation in functional form does not alter the Bread and Peace coefficient estimates, which with near statistical certainty have the same values as in the benchmark regression.

3.3 Fair's economy

One of the best known models of aggregate presidential voting originates with Fair (1978). Since his first paper Fair has since generated a sequence of models, with one revision following the other in the light of successive presidential election outcomes and the model shortcomings (mainly election prediction failures) revealed thereby.[24] The most recent vintage of Fair's equation (6 November 1998, obtained from Fair's web site http://fairmodel.econ.yale.edu) includes three economic variables: *g3*, the average growth rate of real per capita GAP in the first three quarters of the election year, *p15*, the absolute value of the GAP deflator annual growth rate during the first 15 quarters of the administration, and *n-good*, the number of ("good news") quarters during the term in which the annual growth rate of real per capita GDP exceeds 3.2 percent.[25]

Fair rejects the criticism that his work amounts to an empirically driven sequence of ad-hoc regression setups (see, for example, Bartels, 1997), maintaining instead that his equation(s) should be interpreted as implementing the theory that "a voter evaluates the past economic performance of the competing parties and votes for the party that provides the highest expected future utility". (Fair, 1997, p.197) Even *n-good*, the number of high growth rate quarters during an administration, is asserted to be "completely consistent with the general theory". The problem with this claim is that output growth performance (*g3, n-good*) exhibits essentially no persistence from one administration to the next.[26] In any case, the estimates for regression 6 in Table 4

[23] Following Irving Fisher, I also calibrated inflation surprises by decomposing the risk free nominal interest rate (the market rate on three month Treasury Bills) into expected inflation and the expected real interest rate. This inflation surprise series also had no effect on voting outcomes when conditioned on the Bread and Peace model.

[24] Fair (1996) reviews the history of his various equations.

[25] Fair's equation also includes terms for the duration of party control of the presidency and for the party of the incumbent. These coded variables have no theoretical rationale and were evidently developed to fit election outcomes. I disregard them.

[26] During the postwar period *p15* exhibits some persistence given the run up of inflation rates from the 1960s to 1970s, followed by de-escalation of inflation in the 1980s.

show that Fair's economic terms add no significant value to the Bread and Peace model.

3.4 Macroeconomic volatility

Cameron (1978), Rodrik (1999) and Quinn and Woolley (1998) have argued that stabilization of economic wellbeing is an important and consequential demand in democratic political settings. Cameron's seminal paper and Rodrik's more recent research suggest that exposure to macroeconomic instability – which is especially pronounced in small open economies – is the key determinant of international variations in government spending relative to GNP. Their work implies (and in Rodrik's case it is formally based upon) the assumption that electorates have strong distaste for the insecurity associated with macroeconomic instability. Because government spending is less susceptible to market induced fluctuations than private output (and to some degree is designed to offset market volatility), other things equal political democracy is a source of growth of government.[27] Quinn and Woolley's research indicated that macroeconomic volatility had direct negative influence on voting support for the incumbent party in American elections and elections elsewhere.

This line of argument is evaluated by test regression 7 and 8, which adds to the Bread and Peace equation the standard deviation of real disposable income growth rates, computed over the 15 quarters preceding each election. The volatility measure has no significant effect on aggregate presidential election outcomes, and the Bread and Peace parameters are nearly identical to their benchmark values. Parallel regressions (not reported in Table 4) specified with standard deviations (and variances) of changes in log real per capita GDP, the unemployment rate, and changes in the unemployment rate also yielded no evidence that votes for President responded to variations in macroeconomic instability.

3.5 Income distribution

As mentioned before George Stigler (1973) argued that the likely basis of electoral competition is distribution. The only data we have on US income distribution covering the entire postwar period are the Census Department's annual series on

[27] See section 3.6 on 'fiscal conservatism'.

family incomes from the Current Population Surveys.[28] I measure distribution with the Gini Ratio for family income quintiles published by the Census Department.[29] Nearly all of the distributional action in quintile shares consists of flows between the top quintile and the bottom two quintiles. The shifts are known to be significantly affected by the state of the macroeconomy and the scale of income contingent transfers; with high growth, low unemployment and high transfer spending yielding more compressed income distribution.[30]

These patterns imply that high and rising Gini ratios should generally disadvantage the party in power, though the higher turnout propensity of the affluent could dampen this tendency considerably.[31] Moreover, expected discounted lifetime income, for which we have no direct time series measurement, is probably more relevant politically than the static size distributions tracked by the Census Department's family income data. Yet big movements in distribution of quintile shares of current income almost certainly are mimicked by parallel movements in dispersion of expected lifetime incomes. (See Danziger and Gottschalk, 1993.) Despite the imperfections of Gini ratios based on current family incomes, the distribution hypothesis appears to be rejected by the evidence. Estimates for test regressions 9 and 10 indicate that neither election year family income inequality nor the cumulative percentage change in inequality over the term have affected

[28] These data are less than ideal for calibrating distribution. Among other limitations, the Census income concept excludes taxes paid but includes transfers received, although percentage changes in Gini ratios based on a broad concept of income are evidently insignificantly different from changes based on the usual Census income concept. (See Weinberg, 1996.) Moreover, the concept of "family" clearly has changed considerably over the postwar years. The Census Department also produces a "household" series (a more comparable category intertemporally) but these data are available for a shorter period.

[29] Recall the Gini ratio varies between zero and one, taking a value of 0.0 at perfect quintile equality and a value of 1.0 when all income goes to one quintile

[30] Personal taxation (omitted from Census income), though nominally progressive, is effectively proportional and makes very little contribution to equalization. See Hibbs and Dennis, 1988 and the sources cited therein.

[31] The electoral effects of socioeconomically contingent voting turnout is a complicated matter that is well outside the scope of this paper. The most comprehensive analysis is Wolfinger and Rosenstone (1980).

presidential voting outcomes. And the Bread and Peace benchmark coefficients are undisturbed by inclusion of distribution variables.[32]

3.6 Fiscal conservatism?

In vote equations applied to presidential, senatorial and gubernatorial contests in a pooled time series of cross sections for state level election results, Sam Pelzman (1992) found that incumbents' vote shares were invariably depressed by over the term growth rates of real federal government spending per capita. Pelzman's regressions imply that voters draw no distinctions among spending categories (defense, public goods and transfers are "equally poisonous politically"), and that it is spending per se voters have distaste for, not the taxes levied to finance it. Moreover, according to Pelzman the effects are large: Each percentage point of growth in real federal spending per capita sustained for a year lowers the incumbent party's vote share in presidential elections by more than 3 percentage points.

Real federal spending has grown steadily over the postwar period – rising from around 2000 1987 dollars per person in the early 1950s to almost 5000 per person in the mid 1990s. The obvious question raised by Pelzman's results is why successive presidential administrations facing competitive elections did not reverse fiscal course in the light of voters' alleged hostility to the growth of government. Pelzman offers some conjectures which, to say the least, are strained, especially coming from a forceful proponent of the Chicago 'efficient political markets' tradition. Conditioned on the Bread and Peace model, my results imply there is nothing to conjecture about. Spending growth has exacted no electoral penalties. Test regressions 11 and 12 demonstrate that neither cumulative over the term changes in real federal spending per capita nor cumulative changes in federal spending in proportion to GNP (a measure that better calibrates growth in the relative scale of government than per capita spending[33]) had significant effect on votes for President.[34] In other regression

[32] Stoker (1986) and Stoker (1993) shows how adding distribution measurements to macro equations can be used to check the veracity of aggregation procedures, which I solved by just maintaining homogeneous response parameters in (1).

[33] Federal spending in percent to GNP does not exhibit the pronounced trend of per capita real spending; it has oscillated in the low 20's since the late 1960s.

[34] Pelzman used cycle-adjusted and Korean War-adjusted (but not Vietnam War-adjusted) spending data. I do not because such adjustments are inevitably quite arbitrary and raise issues about the veracity

experiments not reported here, I was unable to identify any measure of federal spending that influenced the incumbent party's presidential vote, up or down.

3.7 Candidate 'extremism'

Building on Rosenstone (1983), John Zaller (1998) developed an equation in which aggregate presidential election results are driven by average four-year growth of real disposable income, a "War" dummy variable for 1952 and 1968 *and* the extremism of the incumbent party's candidate relative to his main opponent at each election. Zaller calibrated his relative extremism variable by coding respondent perceptions obtained by the National Election Study polls taken just before presidential elections and just after. Zaller generously made his most recent 'extremism' measurements available to me. Test regression 13 shows that Zaller's relative extremism variable (with high values representing relatively more extreme or less moderate incumbent party candidates) has no effect on election outcomes when conditioned on the Bread and Peace model, the coefficients of which are undisturbed by this variation in functional form.[35]

3.8 Moderating elections

Alesina, Londregan and Rosenthal (1993, 1996) argue that Democratic and Republican officials deviate to the left and right, respectively, from the mainly unidimensional preference position of the median voter. This unobjectionable observation creates, they argue, 'moderating' signals in voting outcomes from off-year to on-year elections, and conversely, over time. Insofar as presidential contests are concerned, the theoretical prediction is that the higher the incumbent party's vote

of results. Since business cycle-adjusted spending, ceteris paribus, rises in contractions and falls in booms, unadjusted data should, if anything, bias regression results toward detecting negative reactions to spending increases.

[35] This of course does not mean that in principle 'extremism' and 'moderation' are not relevant. But the extremity of candidate positions, and of candidates generically, are obviously endogenous phenomena affected by the anticipated electoral consequences of proposing 'far out' policy positions or of nominating 'far out' candidates. Short of selecting candidates and their policy positions by lottery, I do not see how one could argue that candidate characteristics of this sort could ever be regarded as exogenous. For these reasons I think it unlikely that 'extremism' as Zaller thinks of it will ever prove to be an econometrically defensible determinant of election results. This seems to me to be doubly true given the practice of calibrating extremism and related voter assessments from data obtained partly from surveys taken just *after* election dates and, hence, in the common knowledge of the election winners and extensive media commentary thereon.

share in mid-term Congressional elections, the lower the incumbent party's expected vote share at the subsequent presidential election. I test this idea in regression experiment 14 by adding to the Bread and Peace equation the vote share of the president's party at the previous Congressional election (the variable used by Alesina et al.). The results demonstrate that there is no 'moderating' effect from the source proposed by Alesina, Londregan and Rosenthal and that Bread and Peace coefficients are statistically indistinguishable from benchmark values.

3.9 Policy voting and partisan voting

The Bread and Peace model, like most voting equations, is based on the conventional "incumbency" voting assumption: The party in power is rewarded for good and punished for bad performance. Regression 15 simultaneously tests two contrasting hypotheses concerning partisan-based asymmetries in the response of voting outcomes to macroeconomic performance. Extending the political foundation of the so-called partisan theory of macroeconomic policy (Hibbs, 1977), the 'policy voting' hypothesis developed by Kiewet (1981, 1983) holds that parties benefit from bad realizations of macroeconomic variables to which they are generally viewed as attaching highest priority. (See also Meltzer and Vellrath, 1975). Hence under policy voting, no matter which party holds the Presidency the Democrats benefit when the economy is performing poorly on the growth and unemployment fronts, whereas Republicans benefit from high and rising inflation. Partisan voting theory asserts that the parties are evaluated most heavily in terms of realizations of their high priority macroeconomic objectives. Income growth and unemployment have bigger effects on voting outcomes when the Democrats hold the presidency; inflation has greater effect when the Republicans are incumbent. (See, for example, Fox ,1997 and Powell and Whitten, 1993.)

Let *Dem* be a binary variable equal to +1 when the President is a Democrat and zero otherwise. Conditioned on the benchmark Bread and Peace equation, policy voting theory would predict negative coefficients for the first and third test variables in regression 15. Partisan voting implies that the coefficient of the first test variable should be positive and the coefficient of the third should be negative. As in test regression 2, however, the results for this experiment show that inflation had no

significant influence on aggregate votes for President, even allowing for partisan asymmetry. Likewise, I obtained a null result for the real income growth asymmetry term. Test regression 15 therefore supplies no evidence favoring either the policy voting or the partisan voting alternative to the standard incumbency voting assumption.[36]

3.10 Asymmetric voting responses to good and bad realizations of the economy

The idea that voting is more responsive to poor performance than good has a distinguished pedigree. Two eminent examples from political science are Angus Campbell et. al. (1960) who claimed "A party already in power is rewarded much less for good times than it is punished for bad times" (pp.554-55) and V.O. Key (1966) who observed "people vote only against, never for." Subsequently, Bloom and Price (1975) reported regression evidence indicating that aggregate congressional voting outcomes were affected more by negative than positive realizations of economic outcomes. More than a decade later theoretical rationale and laboratory evidence favoring the asymmetry hypothesis was supplied by 'prospect theory', which implies that individuals usually exhibit greater sensitivity to losses than gains. (Kahneman, and Tversky, 1979; Quattrone and Tversky, 1988.)

I apply this idea to real disposable income changes in test regression 16 (and to other macroeconomic variables in test regressions not reported) by computing the absolute value of negative realizations of $\Delta \ln R$ and adding this variable to the benchmark Bread and Peace model. The point estimate for the test coefficient is properly signed but the null hypothesis of zero asymmetry cannot be rejected at any conventional level. And, as before, the null of parameter equivalence between coefficients in the perturbed Bread and Peace specification and in the benchmark model cannot sensibly be rejected.

3.11 Changes in wealth: stock prices

Notwithstanding Paul Sameulson's famous quip that "the stock market has predicted nine out of the last five recessions", stock price changes are an important component

[36] A regressions test identical to 15 except that unemployment appeared in place of real income growth also revealed no signs of policy or partisan voting.

of changes in consumer wealth[37] as well as a commonly used indicator of forward expectations about the macroeconomy. (See Fama, 1990 and Schwert, 1990.) Moreover, the idea that stock price changes are correlated with presidential election outcomes has circulated in the investment community for decades. An example is Yale Hirsch's remark in the 1984 *Stock Traders' Almanac* : "As we have learned in the past, the Dow Jones industrial average has foretold the outcome of presidential elections in this century. When the venerable average gains ground between New Year's day and Election Day, the incumbent party will usually win the election. A loss in the average during the period will usually result in the 'ins' being ousted."

The claim of investment advisors has begun to appear in statistical equations co-populated with more conventional economic variables. Gleisner (1992) and Hanes and Stone (1994) report regressions based on one of Fair's equations (see section 3.3 above) implying that that each percentage point increase in the Dow Jones Industrial Average registered between January and October of the election year yields a vote share harvest of between 0.4 to 0.7 percentage points for the incumbent party's presidential candidate. Conditioned on the Bread and Peace model in test regression 13, however, I find that votes for President exhibited no response at all to changes in the DJIA. The same regression experiment using broader market indices, for example the S&P 500, yielded results no different than what I obtained for the Dow Jones industrials.

3.12 The interest rate spread

In a 1991 paper appearing in the Journal of Finance, Estrella and Hardouvelis reported the startling discovery that the slope of the yield curve had significant capacity to predict cumulative changes in real output up to four years in advance, and successive quarter on quarter output changes up to a year and half in advance. Although the standard errors for output growth forecasts generated by the yield spread were large relative to the variability of output changes, the spread dominated conventional leading indicators of the cycle in out of sample forecasting experiments.

[37] In Halls famous paper (1978) on the life-cycle, permanent income hypothesis about consumption, for example, stock prices were the only variable to improve upon the prediction of future consumption from consumption the previous period.

Subsequently, Estrella and Mishkin (1996) showed that the same yield spread variable used by Estrella and Hardouvelis – the difference between the ten year Tbond interest rate and the three month Tbill rate – had predictive power for the occurrence of NBER recessions up to six or seven quarters ahead.

On the standard argument that citizens know how the world works, at least implicitly, long before econometricians catch on, forward looking voters could have exploited the modest predictive power of the yield spread to guide their electoral behavior. Lower spreads (flatter, or even inverted, yield curves) are noisily associated with slower future output growth and higher future probabilities of recession.[38] The behavioral prediction which follows is that the higher the spread the higher the vote for the incumbent party's candidate at presidential elections. In fact, this line of reasoning already appeared in Berry et al.'s (1996) four equation recursive model of votes for President, presidential job approval ratings, employment growth and inflation, which is one reason why I pursue the issue in this paper. The yield spread is the primes mobile in Berry et al.'s setup. It affects employment growth and inflation, which in turn directly, and indirectly via presidential approval rates, help account for presidential voting.

Test regression 18 shows that conditioned on the Bread and Peace equation the yield spread had no effect on postwar presidential election outcomes. Moreover, no other leading indicator I investigated (including the Commerce Department's well known index of leading indicators) exerted any statistical impact on voting, or perturbed significantly the benchmark Bread and Peace parameter estimates. These results, along with the results for stock price changes in regression 17, reinforce the evidence favoring the retrospective, ex post 'settling up' foundation of the Bread and Peace model.

[38] The transition mechanisms are not well understood. A standard scenario is that high short rates relative to long follows a tightening of monetary policy, which is perhaps undertaken to offset lax fiscal policy and allied fears about higher inflation expectations. Real activity then slows with Milton Friedman's famous "long and variable lags." But Estrella and Hardouvelis present evidence indicating current monetary policy is not the source of the yield spread's forecasting power. However this may be, the yield spread surely cannot be viewed as exogenous with respect to expectations about (and,

3.13 Survey assessments of retrospective and prospective economic performance

Many studies of presidential voting outcomes and presidential approval ratings have tried to distinguish the relative importance of retrospective and prospective valuations of economic conditions by using survey assessments of personal economic wellbeing and the state of national business conditions. (See, for example, Lewis-Beck and Tien, 1996 and MacKuen et al., 1992 and the sources cited therein.) The results of this research are somewhat mixed, but an important message is that expectations about future economic conditions are probably more important than retrospective appraisals.[39] This message contrasts strongly with the cumulative over the term, retrospective evaluations featured in the Bread and Peace model.

In test regressions 19-21 I investigate whether such survey readings of voters' judgments about economic performance (obtained from the University of Michigan Surveys of Consumers) add value to the Bread and Peace model. Regression 19 shows that short-run retrospective assessments of family financial wellbeing and general business conditions exert no significant effects on aggregate votes for President. Test regression 20 yields the same inference for short-run expected future family finances and general business conditions.[40] Test regression 21 delivers the same result for longer run expectations about future general business conditions. Moreover, none of these variations significantly perturbs coefficients of the Bread and Peace equation, which according to the significance statistics in column 3 are with high probability equivalent to their benchmark values.

3.14 Presidential approval ratings in the Gallup polls

Many presidential voting models, especially those geared to forecasting election outcomes, include the President's Gallup Poll job approval rating among prediction regressors. (See, for example, Abramovitz, 1988, Erikson, 1989, Lewis-Beck and Rice, 1992, Erikson and Wlezien, 1996.) Although approval ratings and other poll

hence, realizations of) future real activity and the associated demands and supplies of loanable funds. Nonetheless, forward oriented voters could have used the spread as a noisy forecasting device.

[39] See, however, Clarke and Stewart (1994) who question the robustness of MacKuen et al.'s results for presidential approval to respecifications inspired by modern time series econometrics.

[40] Parallel regressions in which the test variables in 19 and 20 were included one at a time yielded results comparable to those reported.

readings of voter sentiments about the incumbent President, his party, candidates at elections and so forth are logically inadmissible in behavioral models of voting, I nonetheless examine the robustness of the Bread and Peace equation to inclusion of Gallup Poll approval ratings (often referred to as "presidential popularity").[41]

The President's job approval rating certainly does correlate fairly highly with the incumbent party's vote share at presidential elections. Projecting vote shares on third quarter approval ratings, I obtain:

$$\underset{}{Vote_t} = \underset{(4.2)}{31.8} + \underset{(0.08)}{0.40}\ Approval_{t-1}, \qquad \bar{R}^2 = .70$$

where standard errors are in parentheses. However, as shown in the last test regression in Table 4, presidential approval ratings show no sign of having affected votes for incumbent party candidates, when conditioned on the Bread and Peace model. In fact, pre-election approval ratings evidently responded to per capita real disposable personal income growth rates and cumulative killed-in-action in much the same way as votes for President. Applying the Bread and Peace setup to third quarter of election year *Approval* ratings rather than *Vote* shares, yields:

$$\underset{(4.4)}{Approval_{tQ3}} = \underset{(2.2)}{42.6} + \underset{(0.08)}{6.66}\left(\sum_{j=0}^{13} 0.96^j\ \Delta \ln R_{tQ3-j} \left(1 \Big/ \sum_{j=0}^{13} .96^j \right) \right) \underset{(0.27)}{-0.84}\ CUM\ KIA_{tQ3} \qquad \bar{R}^2 = .62$$

[41] The Approval variable is based on computations of the number of Gallup Poll respondents answering "approve" in percent of those answering "approve" plus "disapprove" to the question: "Do you approve or disapprove of the way [name of incumbent] is handling his job as President?" Quarterly values are averages of the approval ratings computed from each poll taken in a quarter.

Table 4. Robustness of the bread and peace model to additional variables
(1952-1996 presidential elections)

$$Vote_t = \beta_0 + \beta_1 \left(\sum_{j=0}^{14} \lambda^j \Delta \ln R_{t-j} \left(1 \Big/ \sum_{j=0}^{14} \lambda^j \right) \right) + \beta_2 CUM\ KIA_t + Test\ Variable(s)$$

Test variable(s)	Test variable parameter estimates (t-ratio / signif. level)	Signif. level for equivalence of $\hat{\beta}_0, \hat{\beta}_1, \hat{\beta}_2, \hat{\lambda}$ to benchmark estimates in Table 1, row 1
1. Incumbent party's vote share at last election ('old' news, unbounded retrospection)	-0.06 (-0.33 / 1.0)	1.0
2. Inflation $\left(\sum_j \lambda^j \Delta \ln CPI_{-j}\right)$	-0.18 (-0.54 / .62)	.99
3. Inflation surprises $\left[\sum_j \lambda^j \left(\Delta \ln CPI_{-j} - E_{-j+1} \Delta \ln CPI_{-j}\right)\right]$	-0.73 (-0.66 / .54)	99
4. Unemployment rate $\left(\sum_j \lambda^j U_{-j}\right)$	-0.87 (-0.68 / .52)	.95
5. Change in unemployment $\left(\sum_j \lambda^j \Delta U_{-j}\right)$	0.02 (0.00 / .99)	1.0
6. Fair's economy:		
election yr. output growth, *g3*	0.26 (0.86 / .43)	
inflation over the term, *p15*	-0.11 (-0.34 / .74)	.77
number of high growth quarters, *good-n*	-0.51 (-1.2 / 0.29)	
7. Volatility (standard deviation) of $\Delta \ln R$ over the term (15 quarters)	-0.23 (-0.46 / .66)	.99
8. Pct. change in volatility (standard deviation) of $\Delta \ln R$ from previous administration	0.07 (0.72 / 0.50)	.99

Table 4 continued

9. Gini ratio for family income quintile shares at the election year	22.5 (0.77 / .47)	.96
10. Cumulative pct. Change over the term in Gini ratio for family income quintile shares	0.86 (0.82 / .44)	.99
11. Cumulative pct. Change in real federal expenditures per capita over the term	-0.12 (-0.60 / .57)	.99
12. Cumulative pct. Change in federal expenditures in proportion to GNP over the term	-0.04 (-0.16 / .87)	1.0
13. 'Extremism' of incumbent party's candidate relative to opponent	-0.76 (-0.72 / .49)	.99
14. House vote share of incumbent party at the previous mid-term election	-0.10 (-.31 / .77)	1.0
15. Policy voting and partisan voting		
$\left(\sum_j \lambda^j \Delta \ln R_{-j} \cdot Dem\right)$	-0.66 (-0.84 / .44)	
$\left(\sum_j \lambda^j \Delta CPI_{-j}\right)$	-2.87 (-0.85 / .44)	.73
$\left(\sum_j \lambda^j \Delta \ln CPI_{-j} \cdot Dem\right)$	2.80 (0.92 / .40)	
16. Asymmetric response to positive and negative real income changes $\left(\sum_j \lambda^j \Delta \ln R_{-j}, \quad for\ \Delta \ln R_{-j} < 0\right)$	3.35 (1.3 / .23)	.76
17. Stock prices; percent change in DJIA from January to October of the election year	0.045 (0.054 / .43)	1.0
18. Yield spread (10 yr. Tbond rate minus 3 mos. Tbill rate), 3rd quarter of the election year	-0.54 (-0.60 / .57)	.99

Table 4 continued

19. Family financial situation today compared to a year ago (% "better" minus % "worse")	0.07 (0.63 /.55)	.81
Business conditions today compared to a year ago (% "better" minus % "worse")	0.03 (0.93 / .39)	
20. Expected change in family financial situation over the next year (% "better" minus % "worse")	0.05 (0.43 / .69)	.96
Expected change in business conditions over the next year (% "better" minus % "worse")	0.01 (0.09 / .93)	
21. Expected change in business conditions over the next 5 years (% "better" minus % "worse")	0.03 (0.42 / .69)	.98
22. Gallup pct. Presidential approval rating, 3rd quarter of election years	0.11 (1.4 / .20)	.74

Notes: Due to lack of 1952 data on the test variables, regressions 1921 are estimated for 1956-96 elections. As noted before, election quarter growth rates are weighed by 1/3:

$$\Delta \ln R_t = \ln\left[\left(R_t / R_{t-1}\right)^{1/3}\right] \cdot 400 .$$

4. Conclusions

I conclude with just two sentences: A simple Bread and Peace model shows that aggregate votes for President in postwar elections were determined entirely by weighted-average growth of real disposable personal income per capita during the incumbent party's term and the cumulative numbers of American military personnel killed in action as a result of U.S. interventions in the Korean and Vietnamese civil wars. No other variable, or set of variables, I have been able to find in the extensive literature on presidential voting adds value to the Bread and Peace model or significantly perturbs its coefficients.

Appendix 1. Calibration of the election effects of American military participation in the Korean and Vietnamese civil wars.

To calibrate the vote losses associated with American participation in the Korean and Vietnamese civil wars, I investigated terms of the form $\beta_2 \sum_{j=0}^{14} \lambda^j X_{t-j} \cdot NQ_t$, where X denotes test variables that included the number of American military personnel *killed-in-action* per quarter, the number of Americans *wounded* per quarter and the total number of American *casualties* per quarter, 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 'inherited' wars, that is, the number of quarters of a new President's administration during which Americans killed-in-action, Americans wounded or total American casualties exerted no effect on the subsequent presidential election outcome. NQ therefore determines how the vote for Dwight Eisenhower in 1956 (who inherited U.S. engagement in the Korean civil war from Harry Truman) was affected by (the small number of) Korean War casualties suffered by American military personnel after he assumed office in 1953 and, especially, how the vote for Richard Nixon in 1972 (who inherited U.S. involvement in the Vietnamese civil war from Lyndon Johnson) was affected by the declining but still significant numbers of casualties suffered by American troops after he assumed office in 1969. NQ could not be estimated directly by standard techniques (it is not identified); it had to be pinned down by manual search over relevant values, NQ = 0 for 1, 2, 3, ..., 16 quarters.

Nonlinear least squares estimation of Bread and Peace test equations for each X variate over relevant values of NQ (with separate lag weighting parameters for real income growth and the American casualty term) established that $\lambda = 1.0$, X = killed-in-action and NQ = 0 for 16 quarters was the optimal combination for calibration of war effects. This yields the cumulative killed-in-action term (*CUM KIA*) appearing in equation (1) of the main text. At optimal value NQ = 16, CUM KIA is nullified (takes zero values) at the 1956 and 1972 elections.

Appendix 2. Data series for the bread and peace equation

VOTE: incumbent party's percentage share of the aggregate major-party (two-party) vote in presidential elections.

DPIPC: disposable personal income per capita, seasonally adjusted at annual rates, from Bureau of Economic Aanalysis, US Dept. of Commerce; used to compute growth rates 1949:2-1959:1.

DPIPC Revised: disposable personal income per capita, seasonally adjusted at annual rates, from Bureau of EconomicAnalysis, US Dept. of Commerce, comprehensive revision of the National Income and Product Accounts, released 28 October 1999; used to compute growth rates 1959:2-1996:4.

CPI: consumer price index, all urban consumers, seasonally adjusted, 1982-84 = 100.

KIA: number of American military personnel killed in action per quarter in Korea and Vietnam; from US Department of Defense, various branches.

	vote	*dpipc*	*dpipc revised*	*cpi*	*kia*
1949:01		1280		23.93	0
1949:02		1271		23.90	0
1949:03		1265		23.70	0
1949:04		1271		23.67	0
1950:01		1355		23.57	0
1950:02		1349		23.77	0
1950:03		1393		24.20	9623
1950:04		1427		24.70	2649
1951:01		1464		25.70	4081
1951:02		1491		25.93	3490
1951:03		1498		25.93	2830
1951:04		1513		26.33	3196
1952:01		1512		26.43	523
1952:02		1523		26.50	975
1952:03		1557		26.67	1394
1952:04	44.6	1584		26.70	1512
1953:01		1604		26.60	812
1953:02		1625		26.73	1219
1953:03		1621		26.87	922
1953:04		1615		26.90	246
1954:01		1622		26.93	152
1954:02		1612		26.90	27
1954:03		1619		26.87	0
1954:04		1645		26.77	0
1955:01		1666		26.80	0
1955:02		1698		26.77	0

	vote	*dpipc*	*dpipc revised*	*cpi*	*kia*
1955:03		1729		26.80	0
1955:04		1745		26.87	0
1956:01		1761		26.87	0
1956:02		1784		27.03	0
1956:03		1800		27.30	0
1956:04	57.76	1828		27.53	0
1957:01		1838		27.80	0
1957:02		1855		28.00	0
1957:03		1872		28.27	0
1957:04		1867		28.40	0
1958:01		1860		28.73	0
1958:02		1870		28.90	0
1958:03		1907		28.90	0
1958:04		1928		28.93	0
1959:01		1946	1952	29.00	0
1959:02			1988	29.03	0
1959:03			1988	29.17	0
1959:04			2005	29.40	0
1960:01			2015	29.40	0
1960:02			2029	29.57	0
1960:03			2030	29.60	0
1960:04	49.91		2030	29.80	0
1961:01			2042	29.80	0
1961:02			2064	29.80	0
1961:03			2092	29.93	0
1961:04			2127	30.00	0
1962:01			2145	30.10	11
1962:02			2171	30.20	5
1962:03			2183	30.30	6
1962:04			2197	30.40	9
1963:01			2212	30.47	17
1963:02			2230	30.53	11
1963:03			2259	30.73	12
1963:04			2296	30.80	38
1964:01			2344	30.90	29
1964:02			2403	31.00	30
1964:03			2436	31.03	31
1964:04	61.34		2465	31.17	57
1965:01			2491	31.30	72
1965:02			2526	31.50	144
1965:03			2599	31.60	261
1965:04			2653	31.73	892
1966:01			2690	32.07	1224
1966:02			2711	32.37	1287
1966:03			2760	32.67	1250
1966:04			2806	32.90	1247
1967:01			2846	32.97	2126
1967:02			2874	33.17	2773
1967:03			2919	33.50	2090
1967:04			2957	33.87	2388
1968:01			3035	34.20	4867
1968:02			3111	34.53	4725
1968:03			3142	35.00	2945
1968:04	49.6		3190	35.43	2052

	vote	*dpipc*	*dpipc revised*	*cpi*	*kia*
1969:01			3218	35.87	3184
1969:02			3284	36.43	3156
1969:03			3380	36.93	1910
1969:04			3434	37.50	1164
1970:01			3484	38.10	1178
1970:02			3572	38.63	1698
1970:03			3643	39.03	870
1970:04			3665	39.60	475
1971:01			3761	39.93	633
1971:02			3848	40.30	472
1971:03			3888	40.70	210
1971:04			3942	41.00	66
1972:01			3997	41.33	53
1972:02			4048	41.60	125
1972:03			4161	41.93	54
1972:04	61.79		4343	42.37	68
1973:01			4444	43.03	30
1973:02			4562	43.93	105
1973:03			4663	44.80	28
1973:04			4807	45.93	74
1974:01			4865	47.30	66
1974:02			4947	48.57	72
1974:03			5077	49.93	44
1974:04			5161	51.47	25
1975:01			5208	52.57	0
1975:02			5505	53.20	0
1975:03			5515	54.27	0
1975:04			5650	55.27	0
1976:01			5795	55.90	0
1976:02			5883	56.40	0
1976:03			6017	57.30	0
1976:04	48.95		6145	58.13	0
1977:01			6279	59.20	0
1977:02			6417	60.23	0
1977:03			6594	61.07	0
1977:04			6782	61.97	0
1978:01			6946	63.03	0
1978:02			7172	64.47	0
1978:03			7353	65.97	0
1978:04			7540	67.50	0
1979:01			7758	69.20	0
1979:02			7898	71.40	0
1979:03			8115	73.70	0
1979:04			8357	76.03	0
1980:01			8639	79.03	0
1980:02			8673	81.70	0
1980:03			8910	83.23	0
1980:04	44.7		9252	85.57	0
1981:01			9489	87.93	0
1981:02			9584	89.77	0
1981:03			9942	92.27	0
1981:04			10075	93.77	0
1982:01			10158	94.60	0
1982:02			10295	95.97	0

	vote	*dpipc*	*dpipc revised*	*cpi*	*kia*
1982:03			10448	97.63	0
1982:04			10554	97.93	0
1983:01			10684	98.00	0
1983:02			10861	99.13	0
1983:03			11146	100.10	0
1983:04			11448	101.10	0
1984:01			11808	102.53	0
1984:02			12116	103.50	0
1984:03			12398	104.40	0
1984:04	59.17		12537	105.30	0
1985:01			12643	106.27	0
1985:02			12975	107.23	0
1985:03			12964	107.90	0
1985:04			13180	109.00	0
1986:01			13395	109.57	0
1986:02			13508	109.03	0
1986:03			13630	109.70	0
1986:04			13687	110.47	0
1987:01			14002	111.90	0
1987:02			13980	113.17	0
1987:03			14354	114.37	0
1987:04			14645	115.43	0
1988:01			14915	116.30	0
1988:02			15165	117.63	0
1988:03			15446	119.07	0
1988:04	53.94		15720	120.40	0
1989:01			16036	121.77	0
1989:02			16171	123.70	0
1989:03			16266	124.70	0
1989:04			16465	125.93	0
1990:01			16892	128.10	0
1990:02			17114	129.40	0
1990:03			17313	131.63	0
1990:04			17381	133.87	0
1991:01			17480	134.87	0
1991:02			17668	135.67	0
1991:03			17779	136.70	0
1991:04			17910	137.83	0
1992:01			18332	138.77	0
1992:02			18529	139.83	0
1992:03			18581	140.90	0
1992:04	46.55		19020	142.13	0
1993:01			18754	143.13	0
1993:02			19106	144.20	0
1993:03			19146	144.87	0
1993:04			19476	146.03	0
1994:01			19326	146.73	0
1994:02			19705	147.67	0
1994:03			19969	149.03	0
1994:04			20276	149.93	0
1995:01			20441	150.90	0
1995:02			20489	152.17	0
1995:03			20670	152.97	0
1995:04			20849	153.90	0

	vote	*dpipc*	*dpipc revised*	*cpi*	*kia*
1996:01			21072	155.10	0
1996:02			21261	156.53	0
1996:03			21517	157.47	0
1996:04	54.74		21687	158.77	0

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