FROM PARTISAN POLICY TO INCOME TO CONSUMPTION TO UTILITY TO VOTES

Robert Grafstein
Department of Political Science
University of Georgia
Athens, GA 30602
bobgraf@uga.edu

This paper investigates why predominantly self-interested voters exhibit weak pocketbook voting. The paper explicitly estimates the impact of partisan government on the income of different kinds of households and, based on the Permanent Income Hypothesis, models the conversion of that income into consumption, the ultimate source of utility in the model. The analysis implies that pocketbook voting is weak because anticipated policy is already incorporated in individual consumption plans. Sociotropic variables--the inflation rate and the unemployment rate--are statistically more powerful because they determine the relative value of partisan policies in the longer term. Using PSID data, empirical estimates of the partisan income effect are used to generate a measure of partisan utility differences. This measure enters into a probit analysis using 1952-2000 NES presidential election data. The pocketbook measure performs as predicted in comparison to sociotropic variables.

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There is good reason to believe that national economic conditions are an important influence on election outcomes (e.g., Lewis-Beck and Stegmaier 2000). Yet after more than thirty years of careful research, I will argue, it is still not clear why economic conditions have this impact. Our inability to explain the transformation of economic circumstances into votes is troubling. It represents a failure to understand a basic link between citizens and government and therefore a failure to understand a fundamental part of democratic politics.

To say the causes of economic voting are unclear is not to say there are no hypotheses. The consensus view is that economic voting is predominantly sociotropic, responding to the state of the macroeconomy rather than personal financial circumstances (see, e.g., Nannestad and Paldam 1994; Lewis-Beck and Stegmaier 2000). Even advocates of the sociotropic thesis, however, recognize that this view is counterintuitive: "personal experiences–personal economic experiences in particular–are compelling in ways that vicarious experiences cannot be" (Kinder and Kiewiet 1981, 130). So the consensus solution to the puzzle of economic voting creates a new puzzle: why is pocketbook voting not only relatively weak but weak in absolute terms? Sometimes the premise of the question has been challenged on statistical grounds (e.g., Kramer 1983). Here the question is interpreted as raising a genuine problem for a theory of economic voting: to explain why pocketbook voting is trumped by sociotropism.

To get a better sense of the problem, consider three common rationalizations of sociotropic voting. One, sociotropic voting is altruistic. But this explanation makes the strong assumption that the typical voter's altruism strongly outweighs her self-interest. Two, sociotropic voting constitutes a retrospective evaluation of incumbent performance. But the advantage of sociotropic over direct pocketbook assessments must still be explained (see

Kiewiet and Rivers 1984, 376; Conover, Feldman, and Knight 1987; cf. Ferejohn 1986). There is at least a common-sense presumption in favor of modeling self-interested voters along the lines suggested by Ronald Reagan (Simpson 1988), "Recession is when your neighbor loses his job. Depression is when you lose yours." Three, sociotropic voting reflects an enlightened prediction about the voter's own future. But individual circumstances are also crucial to future prospects. Why would self-interested voters emphasize the one over the other? Moreover, since national economic conditions are aggregates of individual conditions, why would voters hold government responsible for the one but not the other?

In a world of (predominantly) self-interested voting, the discrepancy between sociotropic and pocketbook results poses a puzzle. Evidently, resolving this puzzle means recognizing that sociotropic influences on voting cannot be interpreted independently of an assessment of pocketbook influences. Interpreting pocketbook influences, in turn, requires understanding how government affects the individual's economic situation and how this impact translates into political preferences.

I propose the following resolution of the puzzling discrepancy between weak pocketbook and stronger sociotropic voting by self-interested voters. The utility associated with self-interested economic voting, I assume, ultimately is derived from consumption. Consumption, in turn, does not respond passively to government policy. Rather, individuals adjust their consumption not only in response to, but in anticipation of policy. In particular, using Friedman's (1957) Permanent Income Hypothesis (PIH) I argue that insofar as a change in administration was anticipated and therefore already incorporated in the voters' consumption plans, their consumption does not change. Consequently, even dramatic swings of economic policy do not necessarily lead to changes in utility and therefore to measurable pocketbook voting. Given existing party differences, only election surprises will directly alter the individual's utility in a way that will motivate pocketbook voting, and even this impact will be distributed over a long horizon.[1]

By contrast, I will suggest that sociotropic variables like inflation and the unemployment rate measure the relative importance of the policies parties are expected to pursue. In the U.S., specifically, the higher the inflation rate or the lower the rate of unemployment, the less will individual voters value Democratic policy interventions. The persistence of these economic forces magnifies this political impact. How this impact specifically differs from the case of election surprises will be spelled out below.

Kramer (1983), in short, is perfectly correct to insist that the natural way to interpret the connection between economic conditions and voting is in terms of causal connections between government policy and individual circumstances. Yet for that very reason he is wrong to argue that aggregate-level analysis can and should fully substitute for individual-level analysis: his causal concerns are in tension with this insistence. The sociotropic-pocketbook

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[1] There is a further reason to expect a limited pocketbook effect. Mounting evidence indicates that presidential election surprises have a negligible impact on the U.S. economy (Carlsen and Pedersen 1999; Faust and Irons 1999; Blomberg and Hess 2003; cf. Alesina and Rosenthal 1995). While the aggregate neutrality of election surprises is mathematically consistent with large inter-individual partisan transfers, these transfers would presumably have a noticeable impact at the aggregate level.

puzzle can be resolved, in my view, only by specifying the individual's consumption function–the way government's impact on income affects her well-being--and by specifying the individual's vote function–her political response. A correct estimation procedure recognizes the cross-equation restrictions between a model of the government's impact on individual income and a model of the way that impact turns into votes.

This procedure requires abandoning an assumption motivating much of the economics of voting literature, namely, that in a voting regression the coefficient on the relevant economic variable is a fixed parameter translating changes in individual income or perceived well-being into votes. The standard econometric estimate ignores the restriction that individuals' decision rules are not necessarily fixed but may be contingent on the political processes influencing their income (see Lucas 1976). In this sense the effort to find a parameter invariant to government's influence is simply misdirected. It conceives of individuals as black boxes receiving economic information as input and producing votes as output. The transformation must be modeled as well (cf. Suzuki 1991).

Accordingly, this paper employs a different method for sorting out individual and aggregate effects. It explores the political consequences of economic conditions by embedding individuals in a model political economy determining their material and, in turn, political interests. The premise underlying the model is simply an elaboration of the standard pocketbook thesis. Income ultimately matters to people because it improves their consumption or the consumption of their descendants. This indirect concern with income motivates their political behavior. Specifically, voters are modeled as supporting the party seen as best able to protect or increase their future consumption. The implied functional relationships between parties and utility have testable implications for individual voting behavior.

A key empirical task is to estimate the way partisan-induced changes in income translate into consumption. Unfortunately, direct estimation of this impact for U.S. voters faces some obvious practical obstacles.[2] One problem is the absence of appropriate data on consumption. The American National Election Studies (NES), for example, provide only pre-tax income data either for the third or fourth year of an administration, which precludes estimation of the partisan impact on disposable income or on first and second year income. Moreover, the relatively broad categorical structure of NES income data would censor the intra-category partisan income changes most likely to occur. Therefore, for this part of the analysis I supplement data from the Panel Study of Income Dynamics (PSID) with appropriate political variables capturing partisan variations in the national government. This produces estimates of partisan impact on after-tax income conditioned on personal and household characteristics.[3] Applying the PIH to these measurements I generate a regressor reflecting

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[2] By the same token, the use of objective economic instruments sidesteps the problem of nonrandom subjective variation in economic evaluations (Duch, Palmer, and Anderson 2000) not to mention their endogeneity with respect to votes (Wlezien, Franklin, and Twiggs 1997; Erikson 2004).

[3] In effect, this empirical analysis estimates the way partisan government affects certain types of households relative to other types of households. To this extent, it estimates the distributive effect of government. Of course, a respondent's perceived personal financial situation may also be relative to the perceived situation of others (see, e.g., Frank 1985).

partisan impact on consumption and, in turn, expected utility. I then estimate the vote function by matching the appropriate value of the relevant individual and household characteristics from the PSID with characteristics sampled by the NES (cf. De Boef and Nagler 2002; Feldman 1984). On this basis I compare the political impact of an election-induced change in individual utility with the political impact of aggregate economic conditions.

PARTISAN INFLUENCES ON THE VOTER'S ECONOMIC POSITION

The electoral impact of pocketbook and national economic conditions is difficult to interpret causally without a model of how individuals use the relevant economic information. In the formal analysis that follows, I abstract from any retrospective dimension to voting: model voters are forward looking, comparing the expected consequences of alternative partisan administrations (see, e.g., Erikson, MacKuen, and Stimson 2000). Incumbents, in other words, are rewarded with votes for past performance only insofar as it informs voters' expectations about the future and about the opportunity costs of slavish loyalty.

Each period, individuals convert income into consumption, the ultimate source of their self-interested utility. The political implications of this conversion depend on the way consumption responds to the changes in income caused by different partisan economic policies. For its part, the PSID provides direct data only on food consumption.[4] Fortunately, consumption may be the final source of utility in the model, but income offers a better measure of the impact of government policy on economic conditions. Therefore, my estimation will

[4] For problems with the use of food consumption to measure general consumption see, e.g., Zeldes (1989) and Deaton (1992, 10-12).

focus on government's impact on income. Friedman's (1957) PIH provides a theoretical link between government's impact on income and consumption-induced changes in utility. According to the PIH, individuals attempt to consume equal discounted shares of their lifetime income, each share representing their so-called permanent income. Transient income, the difference between current and permanent income due to unanticipated variations in income, is apportioned between savings and consumption with this same goal of smoothing in mind.

The Consumption Function

Each individual is hypothesized to make a discrete choice between Democratic and Republican presidential candidates by comparing expected utility under the alternative economic futures associated with each and (i) voting for the Democrat if expected utility under a Democrat exceeds expected utility under a Republican, and (ii) voting for the Republican in the event of the opposite inequality.

By linking variations in income to changes in consumption, the PIH framework provides leverage for estimating the net impact of government on expected utility. In order to develop this link, I will consider a particularly simple case in which individuals maximize their expected utility defined as

$$E_t \sum_{s=0}^{\infty} \beta^s u(c_{t+s}), \qquad (1)$$

where E_t is mathematical expectation given information available at time t which is measured in years, $\beta \in (0,1)$ is the decision maker's temporal discount factor, c_t is consumption at time t, and $u(\cdot)$ is defined by

$$u(c_t) = -\tfrac{1}{2}(c^* - c_t)^2,\ c^* > 0,\ c_t \geq 0, \qquad (2)$$

with c^*, the satiation level of consumption, assumed to be above the expected present discounted value of the household's income with probability near unity. Because consumers never achieve satiation their marginal utility of consumption is positive over the feasible range, but they lose utility insofar as consumption falls short of this level. In this simple construction of the utility calculus, there is no disutility to work. Moreover, model individuals are fairly narrowly self-interested. They derive utility only from their own consumption or the consumption of their descendants as reflected in the summation to infinity.[5] As an additional restriction, expected assets are bounded from below.

A few comments are in order about using a quadratic function to represent this utility. Its mathematical tractability has made it popular in consumption research (and spatial theories of voting). Substantively, it has two principal defects. First, quadratic utility precludes so-called precautionary savings designed to hedge against unforseen contingencies: optimal savings under quadratic utility are influenced by expected income but not by its variance. Second, many question the existence of a satiation point, whether it is reached or not. Below, I finesse both these objections by treating the quadratic as an approximation to a utility function with neither of these failings.

Individuals have access to two forms of income, after-tax labor income i_t at time t and income from assets A_t at time t. Beginning at $t = 0$, assets evolve according to

$$A_{t+1} = R(A_t + i_t - c_t), \tag{3}$$

[5] Whether consumers act dynastically is a debated question. Seater (1993) offers a relatively positive empirical assessment.

where R > 1 is the constant real after-tax gross rate of return.[6] In what follows I also assume that $\beta = 1/R$. Essentially this asserts that individuals do not exhibit a concern with the time of consumption beyond the weighing of relative intertemporal economic opportunities. Under these conditions, it can be shown that (for the following see, e.g., Sargent 1987, 363-73):

$$c_t = \left(1 - \frac{1}{R}\right)\left[\sum_{j=0}^{\infty}\left(\frac{1}{R}\right)^j E_t i_{t+j} + A_t\right]. \qquad (4)$$

In words, the rate at which consumption absorbs income maintains the expected total resources available to the individual. Total resources, in turn, are the sum of current wealth and the expected income stream from labor, converted to its present discounted value.

The income process is described by

$$i_t = \bar{i} + \pi_t, \qquad (5)$$

where $\bar{i}$ designates mean income net of taxes and

$$\pi_t = \sum_{j=0}^{3}\alpha_j P_{t-j}\varepsilon_{t-j} + \sum_{j=0}^{\infty}\lambda_j u_{t-j}, \quad \sum_{j=0}^{\infty}\lambda_j^2 < \infty \qquad (6)$$

with ϵ_t and u_t both zero-mean, independent and identically distributed (i.i.d.) random variables. Although u_t is an income shock reflecting the impact of aggregate economic factors, initially I focus on ϵ_t, which represents the administration-specific partisan component of π_t. In particular, if t-1 is a presidential election year $\epsilon_t > 0$ implies the election of a Democrat, $\epsilon_t < 0$ implies the election of a Republican. Since the shock is realized toward the end of the election year, for purposes of computing expectations it is treated as entering the individual's

[6] While the assumption of constant rates of return is a great simplification, empirically it is not clear that interest rates explain much of consumption growth (e.g., Campbell and Mankiw 1989). Distortionary taxes on income can undermine the assumptions motivating dynastic utility functions like (1), but see Bassetto and Kocherlakota (2004).

information set in the following period.

While ϵ_t is i.i.d., it is canceled in non-election years by the associated dummy variable P_t. That is, $P_t = 1$ if an administration assumes the presidency in year t, $P_t = 0$ otherwise. Finally, the α_j determine the election shock's impact on income over the years the victor is in office. The impact of Democrats and Republicans is assumed to be symmetric (see the Appendix). In short, the income process reflects the periodic (detrended and demeaned) shocks introduced by the election cycle. The shock is "contemporaneous" in the sense that it reflects either a newly installed administration or its impact during its years in power.

Since the impact of ϵ_t and u_t is separable, they can be discussed separately.[7] Temporarily ignoring u_t, one can rewrite (4) using (5), (6), and the fact that $\sum_{j=0}^{\infty}(1/R)^j = 1/(1 - 1/R)$ and $E_t\epsilon_{t+j} = 0$ for $j \geq 1$:

$$c_t = \bar{i} + \left(1 - \frac{1}{R}\right)\left[A_t + \sum_{k=j}^{3}\sum_{j=0}^{3}\left(\frac{1}{R}\right)^{k-j} \alpha_k P_{t-j} \varepsilon_{t-j}\right]. \qquad (7)$$

The idea behind (7) is that expectations about future income incorporate a partisan shock's consequences distributed over the subsequent years of the resulting administration. Thus consumption is now characterized as equaling mean income supplemented by the marginal propensity (i) to consume current wealth, and (ii) to consume the expected partisan change in income. Substituting (5) and (7) into (3) and rearranging produces

$$A_{t+1} = A_t + \left\{ S(j) - (R-1)\left[\sum_{k=j+1}^{3}\sum_{j=0}^{2}\left(\frac{1}{R}\right)^{k-j} \alpha_k P_{t-j} \varepsilon_{t-j}\right]\right\}_j, \qquad (8)$$

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[7] The asset equation (3) can be decomposed into $A_{t+1} = R^*[A_t + i_{1t} - c_t] + R^*[A_t + i_{2t} - c_t]$, where $R^* = R/2$, in the case of i_{1t}, $u_t = 0$ for all t, and $\bar{i}$ and each ϵ_t are doubled, while in the case of i_{2t}, $\bar{i} = \epsilon_t = 0$ for all t and each u_t is doubled.

where S(j) denotes the first summation in (6) and the notation $\{\cdot\}_j$ indicates that lags j = 0, 1, 2, 3 are synchronized across the terms of (8).

According to the traditional analysis of the individual's savings program, assets follow a random walk. Modified in light of electoral politics, (8) says that assets incorporate the effect of political history as voters attempt to forecast income. More precisely, (8) says that next period's increment to current assets is the contemporaneous structured partisan shock to labor income net of the projected future interest income derived from that administration.

The rule for consumption (8) is based on theoretical concepts. To be operationalized, consumption must be interpreted in terms of the income actually reported for statistical analysis. In the tradition of Friedman (1957), define measured income by

$$i_{mt} = \left(1 - \frac{1}{R}\right)A_t + i_t. \qquad (9)$$

Recalling the discussion of (4), measured income can be interpreted as the sum of regular labor income and the income from interest payments sufficient to maintain constant assets. Algebraic manipulation of equations (5), (7), and (9) yields

$$c_t = i_{mt} + \{(1 - 1/R)S(j,k) - S(j)\}_j, \qquad (10)$$

where S(j,k) denotes the double summation in (7). Shifting (8) back one period gives

$$(1 - L)A_t = \{S(j\text{-}1) - (R - 1)S(k,j\text{-}1)\}_j, \qquad (11)$$

where $Lx_t \equiv x_{t-1}$, S(k,j) denotes the double summation in (8), and S(j-1) and S(k,j-1) indicate that the lag has been applied to the time-dated variables P_t and ϵ_t. Now solve (11) for A_t and, using (5), substitute for A_t and i_t in (9):

$$i_{mt} = \bar{i} + \left\{S(j) + \left(1 - \frac{1}{R}\right)\left[\sum_{m=1}^{\infty} S(j-m) - (R-1)\sum_{m=1}^{\infty} S(k, j-m)\right]\right\}_j. \qquad (12)$$

Finally, substituting (12) into (10) gives

$$c_t = \bar{i} + \left\{ \left(1 - \frac{1}{R}\right) \left[S(j,k) + \sum_{m=1}^{\infty} S(j-m) - (R-1) \sum_{m=1}^{\infty} S(k, j-m) \right] \right\}_j . \tag{13}$$

We now have expressions for measured income and consumption. Specifically, (12) tells us that measured income changes with (i) the "contemporaneous" administration shock to labor income, and (ii) a fraction 1 - 1/R of the accumulated impact of past partisan shocks to labor income net of expected interest income. The change in any period, therefore, makes a permanent addition to measured income. This is because savings that respond to partisan shocks are carried forward via asset accumulation. By the same token, the lagged values in S(j-m) and S(k,j-m) are one period out of phase with the current administration and therefore only represent values from previous administrations at four-year intervals.

From (13), changes in consumption are determined by a fraction 1 - 1/R of both the change in projected income due to the current administration and the accumulated change in income described under (ii). Note that the consumption decision modeled by (13) depends critically on the income process (5). A different history of partisan effects would dictate different current consumption choices and therefore would have different utility consequences.

Fortunately, deriving consumption changes from income changes looks much more intimidating than it really is, since for any t the distributed lag on the sum of the partisan dummy variables counts them only once. Thus if t is the year an administration takes office, income in year t changes by α_0 times the partisan shock and consumption changes by $(1 - 1/R)(\alpha_0 + \alpha_1/R + \alpha_2/R^2 + \alpha_3/R^3)$ times the partisan shock. At t+1 the respective changes are α_1 and $(1 - 1/R)(\alpha_1 + \alpha_2/R + \alpha_3/R^2)$. At t+2 the changes are α_2 and $(1 - 1/R)(\alpha_2 + \alpha_3/R)$. Finally, t+3 changes are α_3 and $(1 - 1/R)(\alpha_3)$.

To see where current inflation and the unemployment rate fit into this picture, it is useful to ask what implications they have given the PIH. Obviously, they are of no concern to forward-looking voters unless they imply limits on future opportunities, ultimately through reductions in permanent income. The key insight is that inflation and unemployment are highly inertial processes, so current levels of inflation and unemployment predict future levels. And future inflation and higher unemployment impose future costs on all: in the former case by prompting extra effort to reduce money holdings, necessitating price adjustments for business, and imposing distortions in savings and investments; in the latter case through wage pressure and by prompting additional provisions for job searches.[8] Therefore higher current inflation reduces the attraction of a future Democratic administration's policies concerning the short-term trade-off between inflation and growth (for partisan differences concerning this trade-off see Hibbs 1987). Conversely, higher current unemployment make these Democratic policies more attractive.

Again, this hypothesized reaction by voters does not reflect their failure to adapt to economic realities. Rather, adaptation notwithstanding, voters as voters still care about the predictable consequences of the two parties' policies.[9] In other words, if one party were led by

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[8] Hibbs (1987, 118) questions whether the actual cost of inflation justifies the public's antipathy toward it (see also Lucas 2000), but compare Dotsey and Ireland (1996) and Bullard and Russell (2004).

[9] This reaction should be distinguished from the claim that as consumers they exhibit "excess sensitivity" to predictable changes in income. Attanasio and Weber (1995) and Baxter

pyromaniacs, even fully insured voters would still prefer not having to pay the additional insurance premium that would be required. Moreover, the size of their added premium would be sensitive to exogenous factors like current drought conditions. Turning to actual elections, the voters' "premium" takes the form of positive and negative economic adjustments in anticipation of partisan policies. These adjustments do not represent an election-specific change in personal financial situation. Rather, these persistent components of the voter's personal financial situation are incorporated in their permanent income. Thus Republican candidates benefit from current inflation. For them, persistence pays. Conversely, Democrats benefit from contemporaneous higher unemployment (see Suzuki and Chappell 1996).

In terms of the present model, a voter considers the impact of Democratic policies on inherited inflation, say, as equivalent to the imposition of a persistent inflation tax, and their impact on inherited unemployment as an income subsidy. Election-year inflation, for example, can be represented as a negative value of u_t in (6). It may prompt voter concern about the way expected Democratic policies would propagate this inherited inflation. In the model, then, the resulting partisan "tax increase" is incorporated in the λ_j governing u_t's impact.

To take a simple example, suppose $\lambda_0 = 1$, $0 < \lambda_1 < 1$, and $\lambda_j = 0$, $j > 1$. Using methods parallel to those already employed it can then be shown that an inflation shock's permanent impact on consumption is no longer discounted by (1 - 1/R) but augmented by $(1 + \lambda_1/R)$. Obviously, the greater the persistence, the larger the negative impact. The voter's reaction to this expected change in consumption does not reflect a fixed partisan disposition,

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and Jermann (1999) argue that this finding is largely spurious.

since it is conditional on current economic circumstances. But neither can one categorize it simply as an election-specific reaction to immediate changes in personal financial situation since these adjustments are already built into permanent income.[10]

Finally, the economics of voting literature has found another sociotropic variable to be important, the per capita election-year change in personal real disposable income. As a reflection of economic growth its impact on voting should be the mirror image of unemployment rates. Several factors, however, weaken this correspondence and therefore suggest that this variable will have a more ambiguous political impact. One, any per capita measure of disposable income is affected by population growth. Two, changes in the tax code also have an effect. Three, starting in the mid-1970s a relatively stable income distribution became increasingly positively skewed (Eckstein and Nagypál 2004; this finding is mirrored for the NES data in comparisons such as median versus mean real income). Thus from the 1970s on, an increase in per capita income is more apt to reflect an increase in economic growth per se as distinct from an increase in an individual's personal income.

Calibrating the Vote Function

The partisan impact on consumption only matters as a source of utility. To generate a regressor for the voting analysis, then, the utility function (2) must be empirically specified by assigning a numerical value to the parameter c^*. Given c^*, expected utility is given by

$$\begin{aligned} E_t(u_t) &= -(1/2)c^{*2} + c^* E_t c_{mt} - (1/2) E_t c_{mt}^2 \\ &= c^* E_t c_{mt} - (1/2)[c^{*2} + (E_t c_{mt})^2 + \sigma^2], \quad (14) \end{aligned}$$

[10] Tax policy also has a degree of persistence but generally not to the extent, say, of high and low inflation periods lasting for more than a decade.

where σ^2 is the variance of measured consumption.

Calibrating the utility function is difficult not simply because the implied satiation point c^* is difficult to estimate. As noted above, it is not even clear whether it exists. The resolution I suggest recognizes that quadratic utility's main role is to be mathematically tractable, not realistic. If so, why not force it to mimic as closely as possible a function with better empirical properties? Consider, in particular, the constant relative risk aversion (CRRA) utility function $c^{1-\gamma}/(1-\gamma)$, where $\gamma > 0$ measures the individual's degree of risk aversion. In contrast to quadratic utility, the CRRA function is consistent with precautionary savings in the face of future uncertainty. Therefore, we seek a value for the quadratic parameter that minimizes with respect to c^* the function

$$L = \int_0^{c'} \left(\frac{c^{1-\nu}}{1-\nu} - [-(1/2)(c^* - c)^2] \right)^2 dc. \qquad (15)$$

Technically, the square root of L generalizes to functions the idea of Euclidean distance.

By Leibniz's Rule, the necessary condition for minimizing (15) with respect to c^* is[11]

$$2\int_0^{c'} (c^* - c)\left(\frac{c^{1-\nu}}{1-\nu} + (1/2)(c^* - c)^2 \right) dc + \left(\frac{c^{*1-\nu}}{1-\nu} \right)^2 = 0.$$

This becomes

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[11] The second-order condition for a minimum is that

$$\frac{\partial^2 L}{\partial L^2} = 2\int_0^{c^*} \left(\frac{c^{1-\nu}}{1-\nu} + (1/2)(c^* - c)^2 \right] dc + 2\int_0^{c^*} (c^* - c)^2 dc$$

$$+ 2(c^* - c)\left(\frac{c^{1-\nu}}{1-\nu} + (1/2)(c^* - c)^2 \right] + 2c^{*-\nu}\left(\frac{c^{*1-\nu}}{1-\nu} \right) > 0.$$

Since $0 \le c \le c^*$, each of the terms is positive or weakly positive for all c and therefore the second-order condition is satisfied.

$$\frac{-c^{*(3-\nu)}}{(\nu-1)(2-\nu)}+\frac{c^{*4}}{8}+\frac{c^{*(3-\nu)}}{(\nu-1)(3-\nu)}+\frac{1}{2}\left(\frac{c^{*(1-\nu)}}{1-\nu}\right)^2 = 0. \quad (16)$$

Since solutions for c^* involve a fourth degree polynomial, the best approach is to solve (16) for given values of ν, selecting one for which (15) is smallest. The selection is subject to two constraints. One, the roots of quartic must be real. Two, imputed values of ν must be consistent with empirical estimates from consumption studies using CRRA utility functions.

This second constraint is not very restrictive since estimates of ν are fairly dispersed (e.g., Brav, Constantinides, and Geczy 2002; Gokhale and Kotlikoff 2002; Gourinchas and Parker 2002; Jacobs 2002; Chetty 2003). Based on a grid search, I set $\nu = 1$ in (16), which is within the range of estimates and produces one real root, $c^* = 1.797$.[12] For this value, the sum of utility is - 0.967 as consumption ranges from 0 to 1.797, whereas the same sum for CRRA utility is - 0.744, a 23% discrepancy integrated over the <u>entire</u> range of consumption. However, between 0 and 1.10 the respective values are - 0.911 and - 0.995, while between 1.10 and 1.797 the respective values are - 0.056 and 0.251. Thus the real discrepancy occurs in the top 39% of the income range. This range corresponds to a much smaller fraction of the income distribution, which is more relevant to the empirical analysis. In particular, only four households in the PSID sample have incomes in this range.

EMPIRICAL ANALYSIS: GOVERNMENT'S IMPACT ON INCOME

In order to determine the utility change due to a partisan shock, I must first estimate the income change induced, say, by Democrats relative to Republicans. In this section I use an income regression to derive estimates for the α_j.

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[12] One can use l'Hôpital's rule to show that $(c^{1-\nu})/(1-\nu)$ limits to $\ln(c)$ as $\nu \to 1$.

The PSID provides detailed economic information on families and the individuals in them over the period 1968-1993.[13] While most uses of the PSID focus on the economic lives of individuals, here it is far preferable to compare the partisan impact on after-tax family income. An individual's income depends in part on labor-supply decisions conditioned on and perhaps coordinated with the parallel decisions made by other household members. Only the family unit of analysis internalizes these interdependent choices.[14] An examination of economic influences on voting using individual income would seriously misinterpret those influences.

Nevertheless, using the family as the unit of analysis presents serious complications (see Hill 1992, 55-57). The PSID tracks families by interviewing one adult member per family, typically the "head of the household." However, new households are constituted and reconstituted from earlier waves via cohabitation, marriage, divorce, and the death of a spouse. This means that new families are added to the survey while others disappear or change, depending somewhat arbitrarily on how splits and unions count under one's definition of the

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[13] The PSID runs beyond this period, but the crucial generated variable, Federal income tax owed, is not included in those later years. Citro and Michael (1995, 403) note that the PSID seems less subject to under-reporting of income than other surveys, although see Baltagi (2001, 8) for more sobering judgments on possible measurement error.

[14] While Gokhale and Kotlikoff (2002, 97) interpret the average rank correlation (0.10) between the lifetime earnings of PSID husbands and wives as suggesting there is little assortative mating, it may also confirm the complementary nature of labor supply decisions.

family (see Zeldes 1989, 342). This arbitrary element is particularly important since PSID income questions refer to incomes in the preceding calendar year. There is a problem then in tracking family units over the survey period. Moreover, changes in family composition are quantitatively significant. Nearly 25% of PSID families experience a change in composition in any given year (Hill 1992, 55).

Most important, insofar as the composition of the panel unit is a product of cohabitation, marriage, divorce, and fertility, its existence is not simply a natural event but typically is the result of individual decisions influenced by economic circumstances and prospects. In turn, partisan policy concerning taxation, welfare, and monetary stimulus affects these circumstances and prospects. Thus the very creation, elimination, or continuation of each panel unit may in part be a consequence of government policy and most certainly reflects decisions made by the individuals involved.

In this sense, what is ostensibly a panel wave is a new collection of households. The composition of some of these households is identical across calendar years, but this continuity is a byproduct of period-by-period choices. To avoid the extraordinary complications of endogenizing the formation and dissolution of family units, I assume that family structure is given exogenously each period. Thus I sidestep the serious issue of family identification across panel waves by treating each cross-sectional family as unique, in effect converting panel to pooled cross-sectional data. Modeling the impact of partisan government on each such household should help address the political endogeneity of unit composition.[15] The very large

[15] See Attanasio and Weber (1995, 1132). Of course the problem of family

sample size and the exogeneity of many of the other variables of interest, like race and age, should mitigate other problems of bias that panel data are often used to address.

To measure the impact of election surprises on income it is necessary to model the way pure election surprises lead to economic changes potentially affecting the voter. Following Taylor (1999), assume (a subset of) workers sign staggered multi-year labor contracts setting nominal wages. Furthermore, assume these wages are then subject to partisan economic policy shocks. Although the political economy literature (e.g., Chappell and Keech 1988) has focused on the aggregate consequences of these contracts, my interest here, as noted above, is their impact on households. The Appendix explains the procedure for predicting election outcomes and determining how prediction failures translate into partisan economic shocks to income. The key point is that according to the PIH predictable changes in income do not change consumption. Therefore, replacing these generated shock variables with, say, a dummy variable for Democratic administration, or even the first year of a Democratic administration, would not reflect the intended model.[16]

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identification can be solved by creating pseudopanels (e.g., Baltagi 2001, 189-93) from cohorts defined by income, number of adults, number of children, and so on, but this also imposes a pseudo-exogeneity on these synthetic units.

[16] The impact of the Federal Reserve Bank's accommodation to partisan policy fits within this scheme so long as the model voter understands the consequences, however indirect, of a given party's control.

Variables

Using PSID data, I regress after-tax family income on a set of characteristics such as the head-of-household's race, gender, and age, each interacted with a measure of partisan economic shocks. The dependent variable is the log of after-tax household income, which highlights effects of partisan policy on income that are proportional to current income. This log transformation produces a 50% increase in variance explained. While it also linearizes the exponential trend characteristic of many income series, here this trend variable has a very small and statistically insignificant impact (there is some evidence of a quadratic trend in the untransformed case). The transformation does creates a problem in the case of non-positive income. This was corrected by dropping observations indicating negative income, which applied to a handful of observations each year, and by adding 1 constant dollar to each 0 income observation (the negative income values do exert leverage on the untransformed regressions and could not be fit by this model or others that were tried). NES surveys are bottom coded at 0 income.

With the ultimate aim of providing estimates for α_0, α_1, α_2, and α_3, distinct shock terms–**PShock1**, **PShock2**, **PShock3**, and **PShock4**–were generated for the first, second, third, and fourth years of an administration respectively. Each term takes the value of the shock variable for the appropriate year and 0 otherwise. By construction, these variables are weakly positive for Democratic administrations and weakly negative for Republican administrations. With the possible exception of PShock1, the variables offer a reasonable approximation to my original assumptions about ϵ_t.

In addition to the PShock and dummy variables for year (1968 base), the regressors are **lnAge** [ln(age) with the head of household's age measured in years], **Gender** (coded 1 if female head of household, 0 if not), **Black** (1 if African-American, 0 if not), **Ill** (the number of weeks the head was ill during the year), **Union** (whether head or spouse is a union member), **Education** (years of education top coded at 17), **Clerical** (1 if a clerical worker using U.S. Census categories, 0 if not), **Laborer** (1 if an unskilled or semiskilled worker using U.S. Census categories, 0 if not), **Farmer** (1 if a farmer using U.S. Census categories, 0 if not), **ProfManager** (1 if a professional or manager according to U.S. Census categories, 0 if not), **Skilled** (1 if a skilled worker, 0 if not), **Unemployed** (1 if unemployed, 0 if not), **Retired** (1 if retired, 0 if not), **Housewife** (1 if labeled housewife by original 1968 PSID categories, 0 if not), **Student** (1 if primarily a student, 0 if not), **Midwest** (1 if living in the Midwest, 0 if not), **Northeast** (1 if living in the Northeast, 0 if not), **South** (1 if living in the South, 0 if not), plus (and most important) the preceding variables interacted with the four PShock variables. There is no control indicating whether a Democrat or Republican was in office since these facts are incorporated in the calculation of the PShock.

Oil price shock variables are used to capture more historically specific exogenous aggregate influences on income. They are an imperfect instrument. First, their impact is mediated by energy policy. Second, their impact on GDP growth is asymmetric: the negative impact of increases is much larger numerically than is the positive impact of decreases (e.g., Dotsey and Reid 1992). Third, oil price changes are not necessarily exogenous. OPEC's pricing, for example, responds to market demand conditions. To deal with exogeneity, I follow Hamilton (2003) and instrument oil price changes by current and lagged values of shocks to oil supply occasioned by exogenous military-political disruptions. To deal with asymmetry, I follow Dotsey and Reid (1992) in defining two distinct variables, one recording strictly positive changes in price and another recording strictly negative changes in price. Akaike and Schwarz Bayesian information criteria as well as t-tests determined lag lengths for the oil variables and their instruments, four for both the positive and negative oil shocks.

Income Regression Results

The results are presented in Table 1, which for reasons of space does not list the oil shock variables or year dummies.

[Table 1 about here]

Since this estimation reflects the pragmatic concerns of model voters, not scientists who can suspend judgment, I use a liberal standard ($p < 0.10$) to determine statistical significance for the interaction terms.

The interactions take the form $\ln(i) = (b + b_{ns}X_s)$PShock(n), where X_s is a variable of interest like level of education or employment status and (n) = 1,2,3,4. This expression indicates PShock(n)'s impact on income conditional on the characteristic X_s. In particular setting $X_s = 0$, so that $\ln(i') = b_1$PShock(n), shows the impact relative to X_s's base level. Therefore the difference between the two, namely, $(b + b_{ns}X)$PShock(n) - (b)PShock(n) = $(b_{ns}X_s)$PShock(n), is the difference, due to X_s, in PShock(n)'s impact on the log of after-tax income. As outlined in the next section, the relevant α_j with respect to a given voter type, defined as a set of X_s values, is derived from $\sum_s b_{ns}X_s$, summing over each statistically significant b_{ns}. Finally, although b_4Ill is statistically significant it is not a component of α_3 since Ill cannot be matched to NES data.

EMPIRICAL ANALYSIS: ESTIMATION OF THE VOTE FUNCTION

The vote function is estimated by a probit model. The dependant variable is the probability of voting for the Democratic presidential candidate. The principal regressor is an estimate of the relative difference in expected utility that candidate represents. It is necessary therefore to convert the predicted partisan consumption changes derived from the preceding analysis into predicted changes in consumption for NES respondents by matching each of their sociodemographic profiles to a specific change. These changes can then be translated into differences in expected utility.

The base level of consumption c_{bt} for a representative NES respondent can be derived from (12) and (13) by setting $c_{bt} = \hat{\imath} + (1 - 1/R)$Residual, where (1) $\hat{\imath}$ is his or her predicted household income (calculated by exponentiating predicted ln[i] from a regression on the same characteristics employed in the PSID estimation of the consumption function), and (2) Residual is the residual from this regression net of the change in income due to $(\alpha_2)\text{PShock3}_t$ or $(\alpha_3)\text{PShock4}_t$, the specific contribution of the partisan shock in either year three or year four of the relevant administration.[17]

Note that α_j and $\sum_s b_{ns} X_s$ cannot be equated directly since the latter represents the proportional change in income due to a unit change in PShock. To determine α_3, for example, I first solve $(i_{mt} - i_{bt})/i_{bt} = \sum_s b_{4s} X_s$ for i_{bt}; $\alpha_3 = i_{mt} - i_{bt}$ is then plugged into the equation for c_{bt}. In these calculations, I calibrate R to the average real after-tax U.S. interest rate, 4% (e.g.,

[17] Prior to 1972 the NES income variable (VCF0114) measures election year income, from 1972 on it measures the previous year's income.

Mehra and Prescott 2003), so $1 - 1/R \approx 0.04$. This tells us that, for the sake of consumption smoothing, model agents delay consuming the bulk of any change in their income.

In short, c_{bt} is interpreted as the sum of permanent income and the discounted non-political shock to income. To maximize quadratic utility's fit with CRRA utility, c_{bt} (as well as post-shock consumption) is rescaled so that for all respondents $c_{mt} \leq c^*$. Since the NES records before-tax income, multiplying each by $1.797/c_{max}$, where c_{max} is the highest measured consumption, puts each individual's consumption in the sample strictly below the satiation point. By the same token, because I use after-tax income the preceding calculation of utility differences is in general distorted by the failure to factor in average tax rates for each individual. If, on the other hand, the calculation used log utility instead of the quadratic utility approximation, the tax rate would be impounded in the intercept term. Fortunately, the specification of quadratic utility employed here is equivalent to log utility (see note 12). At any rate, the baseline utility for comparing the impact of a succeeding four-year administration is $EU(c_{bt}) + \beta EU(c_{bt}) + \beta^2 EU(c_{bt}) + \beta^3 EU(c_{bt})$, where again $\beta = 1/R$. $EU(c_{bt})$ is determined by plugging c_{bt} into (14). In this calculation $c^* = 1.797$.

To determine the utility expected from Democrats, model voters compare their baseline utility with their projected utility were a Democrat to win. When computing projected partisan utility, therefore, the four PShock terms associated with each election year are (re)calculated to reflect the possibly counterfactual condition that the Democrat is victorious (see the Appendix). Thus for NES respondents the projected post-election levels of consumption for each of the succeeding four years conditional on a Democratic victory in November of t-1 is given by $c_{Dt+j} = c_{bt} + (1 - 1/R)\sum_j^3[(1/R)^j \alpha_j PShock_{Dt+j}]$, $j = 0,1,2,3$, where $PShock_{Dt}$ is the hypothetical

PShock just described. Again, the α_j are matched to each particular NES sociodemographic profile. For j = 0,1 they are recovered from $i_{mt+j} - i_{bt}$ using the method just described for j = 3, 4, but this time first solving for i_{mt+j}. Conditional expected utility at time t is then $EU(c_{Dt}) + \beta EU(c_{Dt+1}) + \beta^2 EU(c_{Dt+2}) + \beta^3 EU(c_{Dt+3})$. Subtracting $EU(c_{bt}) + \beta EU(c_{bt}) + \beta^2 EU(c_{bt}) + \beta^3 EU(c_{bt})$ from this sum yields, for each sociodemographic type, the expected utility difference due to a hypothetical Democratic victory, which I label **EUdiff**. Finally, from (13) any partisan shock to consumption is permanently added to future consumption for each of the years succeeding the resulting administration (that is, t+4, t+5, . . .). In present value terms, this means the expected partisan utility difference must be multiplied by $1 + \beta^4/(1-\beta)$.

A theoretically appropriate voting analysis must be sensitive to the way EUdiff is constructed and the model of political choice it reflects. Specifically, sociodemographic variables should not appear as separate regressors since they already given their due in EUdiff itself. Achen (1992) makes this point about Party ID. Party ID, on his interpretation, encapsulates the voter's current estimate of the future differential in party benefits. In particular, it summarizes all the politically relevant information voters originally receive from their parents and later modify based on their own experience. Achen (1992, 198) concludes:

> when researchers are being theoretically serious, demographics should be discarded. They belong neither in party ID nor in vote equations. The voter's political history is the only causal variable. Age, social class, and other background factors may be correlated with history, of course; they may provide a serviceable summary for purely descriptive purposes. But they do not belong in explanatory equations.

The same argument applies to EUdiff.

Despite concerns about its endogeneity, there is much to be said for including Party ID in an analysis of EUdiff. First, Party ID incorporates all perceived party benefits whereas EUdiff is purely economic. Second, Party ID is likely to reflect family influence, which can be a legitimate part of a fully developed expected utility analysis of partisanship (Piketty 1995). Third, if Achen (1992, 208-209) is correct, measured ID will be influenced by voter-specific campaign information that a party-oriented measure like EUdiff fails to capture even when supplemented by election-year dummy variables. Finally, Party ID constitutes a voter's "standing decision" (Achen 1992, 200, quoting V. O. Key), while EUdiff measures a deviation in consumption from a standing disposition to consume out of permanent income. Thus the PIH explains why in general voters' economic utility is not greatly affected by which party wins any given election. But long-term systematic party differences, weighted by the proportion of time the two parties are in power, affect utility generally, mean income $\bar{\imath}$ in particular. Therefore party differences affect the voter's mean utility level, in contrast to election-specific utility differences.

Unfortunately, Party ID and EUdiff are not simply complementary. Since EUdiff measures the degree to which voters materially benefit from a surprise Democratic victory, it is likely to be related to any measure like Party ID that reflects in part the economic benefits Democrats have come to represent to that voter. Indeed the stronger the economic motivations behind Party ID, the more it should act as a confounder of EUdiff. But given the way the two variables are constructed–one a generic survey item and the other a rigorously developed measure of utility from consumption–I am inclined to interpret their overlap as a indicator of

Party ID's relation to EUdiff rather than the reverse.

Table2 reports estimates for three probit models that include "sociotropic" aggregate-level economic variables. In each the dependent variable is **Vote**, coded Democratic = 1, Republican = 0, and each includes the regressors **EUdiff**, the expected utility difference just calculated; **PDI**, the percent change in real per capita personal disposable income; **Inflation**, the percent change in CPI for the election year**; Unemployment**, the average unemployment rate for the election year; election-year dummy variables (1952 base); and a constant. Model 1, with these variables, is designed to reflect generic sociotropic concerns. Model 2 supplements Model 1 by interacting each of the aggregate variables with a dummy variable coded 1 for a Democratic incumbent, 0 for a Republican incumbent. This model is designed to capture the role of sociotropic concerns in response to the performance of the incumbent party. The incumbent dummy variable dropped due to multicollinearity. Model 3 adds **Party ID** based on a seven point scale, with 1 = strong Democrat and 7 = strong Republican. To save space, election-year dummy variables are not listed.[18]

[Table 2 about here]

In Model 1, EUdiff and the sociotropic variables behave qualitatively as expected. Likewise for Model 2, which suggests that voters are cognizant of the incumbent party's record on aggregate economic indicators.[19] With Model 3's addition of Party ID, EUdiff is no

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[18] Since EUdiff is a generated regressor, its standard error is biased downward. I therefore use a bootstrapped standard error for this variable.

[19] For interactions, standard errors and statistical significance were calculated for the

longer statistically significant and loses strength as the model gains explanatory strength. Given the conceptual overlap between Party ID and EUdiff already noted and the theoretically anticipated weakness of the latter, the confounding effect is hardly surprising.

To gauge the relative importance of EUdiff and the sociotropic variables, I use CLARIFY (Tomz, Wittenberg, and King 2003) to estimate the impact of a change in each of these regressors from its mean to one standard deviation above its mean, holding all other variables at their means, conditional on a Democratic or Republican incumbent (I use overall means for the main effects sociotropic variables; using different Democratic and Republican means makes essentially no difference).

[Table 3 about here]

Four points are worth noting about these first-difference estimates. One, the first difference of EUdiff consistently is associated with a smaller percentage change in the probability of voting for a Democrat than are the sociotropic variables.[20] This provides additional confirmation that pocketbook voting has been neutralized by pocketbook considerations. Again, a finding that EUdiff causes a dramatic change in the vote would present a theoretical puzzle. Two, the sociotropic variables have a consistently greater impact than EUdiff, even when incumbency is taken into account. Three, per capita income's

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entire conditional expression.

[20] The difference in the percent change in the probability of voting Democratic is the appropriate column to examine, since for a nonlinear function such as probit the gradient for changes in probability will be sensitive to the baseline probability.

behavior seems to reflect retrospective voting, although the introduction of Party ID weakens this implication. As noted above, per capita income can be expected to be a weaker partisan variable. Four, Party ID consistently has a larger impact than all other variables, confirming its baseline importance as a continually revised assessment of party performance.

In contrast to per capita income, there clearly is a core disposition toward prospective sociotropic voting with regard to inflation and unemployment, that is, voting independent of the incumbent party. With respect to inflation, for example, a one standard deviation increase in inflation under a Republican administration (controlling for Party ID) is associated with a 37% reduction in the probability of voting Democratic. Similarly, a one standard deviation increase in unemployment under a Democratic administration is associated with a 29% increase in the probability of voting Democratic (see Kinder and Kiewiet 1981, 133-34).

In sum, pocketbook influences have a muted impact, as expected. The pocketbook measure EUdiff is a theoretically dictated construct and generated through a fairly complicated process independent of respondent perceptions or subjective evaluations. Therefore, the extent to which Party ID serves as a confounder (cf. Kinder and Kiewiet 1981, 152) is a positive finding, suggesting that EUdiff's impact is not a statistical artifact. Finally, theory also predicts that sociotropic variables will not only have a larger impact than EUdiff but this impact will have an important prospective dimension. These expectations were also confirmed.

CONCLUSION

The transformation of economic conditions into individual votes is one piece of a very large puzzle involving the impact of those votes on the relative share of power among political parties, the policy differences among parties, and the effect of monetary, fiscal, and welfare policies on people's lives. While these other topics have received considerable attention from political economists, the microfoundational question tackled here has largely been monopolized by survey researchers. Unfortunately, existing survey instruments are not particularly well suited to political-economic models or explanations. One virtue of the alternative model developed here is that one can pose questions to it that models relying exclusively on survey research cannot answer.

The central question is how individual votes are influenced by partisan economic policies. The central answer, according to a PIH-based model, is that even if Democratic and Republican administrations have a substantial economic impact on people who care deeply about their material well-being, the election of any particular administration will tend to have a very attenuated influence on individual utility. The reason lies with the distinction between income and consumption. To the extent household consumption plans already factor in the systematic impact of the two parties on income, a single election outcome only changes household utility to the extent the result is a surprise. The way an administration comes into office may or may not influence its policies, but its electoral history affects how those policies affect individual voters. By the same token, I suggest that the general economic conditions associated with sociotropic variables also affect individual income, conditioning the relative importance of partisan policy differences. Moreover, since these economic conditions are quite persistent, they have a larger role in determining the vote.

APPENDIX

This section details the presidential election forecast procedure and its relation to the impact of partisan shocks.[21] In order to impute an election prediction I use a slightly modified quarterly version of Fair's (1998) election forecast model amended to exclude a "war" dummy variable for 1948 and to include Gallup trial-heat data for the 15^{th} and 16^{th} quarters of the election cycle, that is, the two quarters immediately prior to the election. Trial heat data collected prior to September of the election year have not proven to be of serious value in election prediction efforts (Campbell and Garand 2000). Fair's vote predictions are thus transformed into quarterly observations representing the information available to wage setters at a given quarter prior to the next election. Adding opinion data, however, limits the sample for estimating the Fair prediction model to the post-World War II period in which Gallup trial-heat results are available. The original Fair model election sample extends back to 1916.

Fair's model does not represent my idea of an explanation of the Democratic share of the two-party vote. It is purely a forecasting tool. I choose it over other very credible models primarily because its emphasis on economic factors is in the spirit of the paper, although it is by no means unique in this respect, and because it permits a forecast horizon compatible with the model used here. In general, political scientists have applied forecast models when they are most credible and useful, namely, when the election is on the horizon. These models also tend to be quite parsimonious, which is particularly appropriate given the limited number of election-year observations. But this parsimony is a handicap for my purposes since critical

[21] This procedure was developed in collaboration with Kiki Caruson.

variables in these models are no longer appropriate for longer-lagged, quarterly forecasts.

Thus Abramowitz (2000) appeals to GDP growth in the first half of the election year, which is too specialized for my purposes. Moreover, a given six month rate of growth may reflect either declining or increasing GDP growth over the period. My modified Fair model is less susceptible to this particular problem because it considers quarterly growth and singles out particularly high positive growth. Campbell (2000) relies heavily on trial-heat polls, which cannot be applied with a sufficient lag to accommodate the entire contract length (up to two years) assumed in this analysis. Lewis-Beck and Tien (2000) and Wlezien and Erikson (2000) include leading economic indicators to tap prospective calculations by voters, but the forecasting horizon of these indicators is generally only two quarters (e.g., Rogers 1998). Lockerbie (2000) uses consumer sentiment concerning the next year, which in the model used here does not always implicate an election. In sum, the modified Fair model offers the best representation of the kind of calculation wage setters are likely to rely upon as they negotiate labor contracts throughout the 15 quarter period prior to a presidential election.

The next question is how election predictions figure in the voter's economic planning. It is assumed that the policy preferences of the two parties differ and are known by the public. In principle, predictions about election outcomes and the resulting policies can be made at any time. Here, each specific prediction is adapted to the information available to wage bargainers at the successive quarters prior to the next election, thereby incorporating all applicable contracts up to a lag of seven quarters, which reflects the wage contract length of eight quarters Carlsen and Pedersen (1999) find to be optimal for the U.S.[22] Partisan shocks have no impact at lags greater than that. The economic impact of prediction mistakes–discrepancies between the predicted probability of a party's success and the actual outcome–is computed based on Carlsen and Pedersen's (1999) explicit grounding of Alesina's (1987) model of rational partisan business cycles. Specifically, the quarterly partisan shock is determined to be

$$PShock_{qt} = Dem_t - (1/8)\sum_{\tau=t-7}^{t}[Dem_\tau(1-g) + \Pr obDem_\tau g],$$

where:

i. the signing of contracts is assumed to be equally distributed across all quarters;

ii. $Dem_\tau = 1$ if a Democrat is president at time τ and 0 if not;

iii. $ProbDem_\tau$, the probability of a Democratic victory calculated at time τ, is defined by (see Chappell and Keech 1988; Carlsen and Pedersen 1999):

$$\Pr obDem_{T-k} = ST\left(\frac{E_{T-k}Vote_T - 0.5}{\sigma_k}\right),$$

with $E_{T-k}Vote_T$ the expected Democratic share of the two-party vote in an election at time τ calculated using information available at time τ-k, σ_k the estimated forecasting error of the regression, and ST the cumulative student's t distribution. Note that the studies just cited used different election forecast models. Finally, g(t), which reflects the wage setters' quarterly discount factor δ, is defined by:

$$g = \begin{cases} 0 & if\ T \geq t+7 \\ (\delta^{T-t+1} - \delta^8)/(1-\delta^8) & if\ T < t+7. \end{cases}$$

Following Carlsen and Pedersen (1999) I set $\delta = 0.99$, which annualized equals $0.96 = 1/1.04 = 1/R = \beta$. Jacobs (2002) estimates β in the 0.9 to 0.95 range. Gourinchas and

[22] I assume that contracts are signed at the beginning of a period, so that those signed more than seven quarters prior to an election expire before the new administration takes office.

Parker's (2002) similar estimate is about 0.96. I also assume a one-quarter lag in implementing the labor contract. Abstracting from the impact of staggered wage contracts, then, for each election year $\underline{t}$ PShock measures Dem_t - $ProbDem_t$ and therefore ranges between 1 (a totally surprising Democratic victory) and - 1 (a totally surprising Republican victory). Since the calculation is quarterly, each year's PShock is summed over the relevant four quarters. Since the election occurs in the final quarter of the year, in estimating the vote function PShock1 is summed over the four quarters following the election. For subsequent years PShock2, PShock3, PShock4 are summed as well. Finally, since the vote function characterizes the probability of voting Democratic, each relevant value of PShock is conditioned on a possibly counterfactual Democratic victory. This means setting $Dem_\tau = 1$.

Table 1 Regression for Predicting log of After-Tax Income

	Coefficient	SE		Coefficient	SE
PShock1	-0.3	0.18	SouthShock1	0.03	0.032
lnAgeshock1	0.001	0.0345	SouthShock2	0.3	0.18
lnAgeShock2	-0.4*	0.20	SouthShock3	0.8	0.76
lnAgeShock3	-1.1	0.82	SouthShock4	0.03	0.081
lnAgeShock4	0.02	0.086	SkilledShock1	0.16***	0.038
GenderShock1	-0.03	0.032	SkilledShock2	1.3***	0.23
Gendershock2	-0.2	0.19	SkilledShock3	5.9***	0.91
GenderShock3	-1.7**	0.76	SkilledShock4	0.3***	0.10
GenderShock4	0.11	0.081	ProfmanShock1	0.16***	0.040
IllShock1	0.002	0.0035	ProfmanShock2	1.4***	0.24
IllShock2	0.006	0.0157	ProfmanShock3	6.5***	0.96
IllShock3	-0.06	0.068	ProfmanShock4	0.3**	0.11
IllShock4	-0.029***	0.0096	HouseShock1	0.09	0.083
UnionShock1	-0.02	0.018	HouseShock2	1.4***	0.49
UnionShock2	-0.2**	0.11	HouseShock3	8.4***	2.0
UnionShock3	1.05*	0.511	HouseShock4	0.2	0.22
UnionShock4	0.07	0.055	StudentShock1	0.6***	0.14
EdShock1	-0.009*	0.0049	StudentShock2	2.7***	0.91
EdShock2	-0.10***	0.028	StudentShock3	4.1	3.29
EdShock3	-0.04	0.115	StudentShock4	-0.07	0.344
EdShock4	0.007	0.0121	UnemployShock1	0.14**	0.056
ClericalShock1	0.22***	0.042	UnemployShock2	1.1***	0.34
ClericalShock2	1.3***	0.25	UnemployShock3	23.7***	0.71
ClericalShock3	6.913***	1.0094	UnemployShock4	1.43***	0.043
ClericalShock4	0.2**	0.11	RetiredShock1	0.12*	0.065
LaborerShock1	0.19***	0.044	RetiredShock2	0.9**	0.39
LaborerShock2	1.4***	0.28	RetiredShock3	6.6***	1.51
LaborerShock3	6.11***	1.068	RetiredShock4	0.09	0.16
LaborerShock4	0.3**	0.12	Gender	-1.44***	0.018
FarmersShock1	0.09	0.054	Ill	-0.004**	0.002
FarmersShock2	1.006***	0.343	Union	0.42***	0.011
FarmersShock3	6.6***	1.25	Education	0.189***	0.0026
FarmersShock4	0.4***	0.14	Clerical	0.91***	0.023
BlackShock1	0.01	0.027	Laborer	0.82***	0.025
BlackShock2	0.04	0.157	Farmer	0.49***	0.031
BlackShock3	-0.7	0.64	Black	-0.83***	0.015
BlackShock4	-0.03	0.068	NE	-0.11***	0.020
NEShock1	0.05	0.037	MW	-0.04**	0.019
NEShock2	0.2	0.21	South	0.13***	0.018
NEShock3	-0.6	0.87	Unemployed	-0.92***	0.027
NEShock4	-0.07	0.092	Retired	-3.96***	0.035
MWShock1	0.09***	0.034	Housewife	-4.88***	0.046
MWShock2	0.4**	0.20	Student	-2.0***	0.082
MWShock3	1.07	0.804	Profmanager	0.60***	0.022
MWShock4	-0.05	0.085	Skilled	0.81***	0.021
			lnAge	0.88***	0.020
			Constant	4.20***	0.091

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$ $R^2 = 0.60$; N = 138,111; robust standard errors

Table 2 Estimation of Probit Models of Presidential Vote 1952-2000

	Model 1	Model 2	Model 3
EUdiff	0.04**	0.04**	0.0003
	(0.007)†	(0.007)†	(0.00849)†
PDI	- 0.10**	- 0.08**	- 0.10**
	(0.011)	(0.011)	(0.01)
Inflation	- 0.05**	- 0.10**	- 0.14**
	(0.007)	(0.020)	(0.008)
Unemployment	0.11**	0.22**	0.33**
	(0.013)	(0.019)	(0.02)
DemPDI		0.13**	0.10**
		(0.016)	(0.021)
DemInflation		0.04**	0.003**
		(0.012)	(0.015)
DemUnemploy		0.02**	0.07**
		(0.028)	(0.036)
Party ID			- 0.518**
			(0.0079)
Constant	- 0.21**	0.92**	0.5**
	(0.070)	(0.093)	(0.12)
N	13471	13471	13449
Pseudo R^2	0.02	0.02	0.41

* $p < 0.05$; ** $p < 0.01$; standard errors in parentheses (Democratic incumbent for interaction terms; Republican incumbent for "main effects" terms);
† bootstrapped standard error

Table 3 First Differences

	Change in Probability of Vote for Democrat	95% Confidence Interval		% Change in Probability
Without Interactions				
EUdiff	0.02	0.015	0.033	4%
PDI	-0.06	-0.077	-0.049	-13%
CPI	-0.06	-0.072	0.044	-13%
Unemployment	0.07	0.050	0.082	16%
With Interactions and Hypothetical Democratic Incumbent				
EUdiff	0.02	0.014	0.031	3%
PDI	0.03	0.011	0.051	5%
CPI	-0.06	-0.090	0.036	-7%
Unemployment	0.12	0.1005	0.138	27%
With Interactions and Hypothetical Republican Incumbent				
EUdiff	0.02	0.014	0.031	5%
PDI	-0.05	-0.063	-0.038	13%
CPI	-0.10	-0.130	-0.062	-26%
Unemployment	0.13	0.110	0.153	34%
With Interactions, Party ID and Hypothetical Democratic Incumbent				
EUdiff	0.00002	- 0.0095	0.0102	0.0003%
Party ID	-0.41	-0.419	-0.40	-62%
PDI	-0.003	-0.0277	0.0214	-2%
CPI	-0.15	-0.181	-0.118	-23%
Unemployment	0.19	0.169	0.201	29%
With Interactions, Party ID, and Hypothetical Republican Incumbent				
EUdiff	0.00007	- 0.0093	0.0103	0.002%
Party ID	-0.28	-0.288	-0.263	-85%
PDI	-0.06	-0.074	-0.046	-18%
CPI	-0.12	-0.154	-0.086	-37%
Unemployment	0.20	0.173	0.228	61%

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