

**QUALITY OF LIFE FROM THE VOTING BOOTH: THE EFFECT OF CRIME  
RATES AND INCOME ON RECENT U.S. PRESIDENTIAL ELECTIONS**

Michael R. Hagerty  
Graduate School of Management  
University of California  
Davis, CA 95616  
(530)752-7619  
(530)752-2924 (Fax)  
mrhagerty@ucdavis.edu

March, 2005

## **QUALITY OF LIFE FROM THE VOTING BOOTH: THE EFFECT OF CRIME RATES AND INCOME ON RECENT U.S. PRESIDENTIAL ELECTIONS**

### **Abstract**

Quality of Life (QOL) is often measured with surveys of citizen's satisfaction. In contrast, the current research uses already-existing voting data to infer citizens' perceptions of QOL. Under this model, citizens decide how much their QOL has improved (or declined) since the last election, and then vote to reward (or punish) the incumbent party accordingly. Analysis of the popular vote for the incumbent party then allows inference on how citizens judge their QOL and how they weight the various domains. Previous research has concluded that voters reward an incumbent who improves the economic domain prior to election. I test whether voters also reward declining crime rates, and estimate how citizens weight the relative importance of each in determining QOL. I analyze the vote shares by state from U.S. presidential elections from 1972-1996. Results show that changes in crime rates do influence vote share, consistent with the responsibility hypothesis, but to a smaller degree than the economic domain does. The method described provides convergent evidence that citizens weight domains differentially, and can provide the weights for a national QOL index.

## 1. Introduction

The news media give the impression that presidential elections in the U.S. are decided in the closing days of the election campaign when many voters “make up their minds” on candidates. However, research over the last 30 years has shown that presidential elections can be predicted with fair accuracy using information that is available even before the campaign begins. For example, Rosenstone (1985) concludes of one election, “President Reagan’s victory in 1984 and the margin by which he won were due to conditions that were in place well before the campaign even began” (p.32). Economic conditions in particular have been shown to be influential. When the economy has successfully expanded during the incumbent’s term, votes for the incumbent party increase. Lewis-Beck and Paldam (2000) review this literature and Abrams and Butkiewicz (1995) provide some recent U.S. results supporting this thesis.

The theory underlying this literature is termed the “responsibility hypothesis” – that voters hold the incumbent party responsible for economic outcomes while in power. The present paper broadens the responsibility hypothesis to other aspects of Quality of Life. If the responsibility hypothesis can be generalized, then voters hold the governing party responsible for many domains of QOL, such as reduced crime, pollution, etc. If so, then it should be possible to calculate the relative importance weights that the average voter places on each of these domains of QOL (c.f., Hagerty, Naik, and Tsai 2000). The present paper tests whether the responsibility hypothesis holds specifically for crime rates in U.S. presidential elections, and estimates the weights that the average voter places on crime versus economic domains.

Is it reasonable to expect that citizens hold the president responsible for changes in the crime rate? Candidates have themselves suggested as much – for example, in 1968 Nixon successfully campaigned on “law and order.” Further, the federal government budgets money to help pay for hiring and training police, for prisons and laboratories. As a result, the Gallup Poll has consistently reported that voters consider the crime issue important in deciding whom to vote for in presidential elections. Most recently, Gallup (1997 p.18) reports that 66% of U.S. voters in 1996 called crime a top or high priority in how they vote for president, the second most important issue in the survey (the economy was named third). Hence it seems reasonable that voters hold the president at least partly responsible for keeping crime rates down.

In this paper, I shall follow the most common approach of the voting literature by regressing presidential popular vote share onto changes in income and crime rates during the incumbent’s term in office. Section 2 describes the theory and its predictions in more detail. Section 3 describes the empirical results, and Section 4 concludes.

## **2. Theory and previous research**

The theory outlined here is that voters rationally evaluate the effects of increased crime rates in terms of expected losses to themselves. They can then compare expected losses from crime rates to expected gains from increasing disposable income during the governing party’s term to decide how to reward or punish the incumbent. Note that in this model voters consider not their own actual losses from crime, but their expected losses if such crime rates continue indefinitely. To calculate expected losses from crime, we consider violent crimes separately from property crimes, since the character of losses differs for each.

### *2.1 Losses from violent crime*

Violent crimes are defined by the FBI as murder, forcible rape, robbery, or aggravated assault. To calculate losses from violent crime, Miller, Cohen and Rossman (1993) defined three categories of costs: (1) direct losses – costs of medical, mental health, emergency response, and insurance administration, (2) productivity losses – lost wages, fringe benefits, and housework, and (3) nonmonetary losses – pain, suffering, and quality of life. The first two categories were estimated from longitudinal studies of victims' hospital stays (if any), days lost from work/housework, and long-term disability. The last category was estimated in two ways, from jury awards for similar injuries, and from surveys on willingness-to-pay for devices that prevent personal injury, such as smoke detectors and airbags. Using these categories, they calculated total losses for violent crime in 1989 to be \$178 billion per year. This was 4.6% of the total Disposable Personal Income (DPI) in 1989.

Computing the losses from crime in dollar terms as above allows a direct comparison of relative importance of crime to DPI. To the extent that losses from an increase in crime rate exceed gains from an increase in DPI, then voters will be more likely to vote against the incumbent. In particular, if Miller, Cohen, and Rossman (1989) calculations are correct, then a 1% (marginal) increase in crime should affect voters just 4.6% as much as voters faced with a 1% (marginal) decline in DPI. This prediction is formalized as:

P1: Voters hold the president responsible for growth in violent crime. However, the effect will be small (4.6%) compared to the effect of growth in DPI.

## 2.2 Losses from property crime

Property crimes are defined by the FBI as burglary, larceny, motor vehicle theft, and arson. Property crimes are simpler to measure, because the losses are primarily monetary and involve no personal injury. The Bureau of Justice Statistics (1993) measures the monetary value of property crimes from national surveys of U.S. residents. Residents are probed to recall all instances of crime victimization over the previous 6 months, and are asked to report all losses resulting from the crime, including property loss or damage, cash losses, and other costs. Average losses in 1991 were \$21.2 billion from property crime, or about .4% of the \$5.78 trillion of total DPI – quite small relative to total DPI. Therefore I predict:

P2: Voters hold the president responsible for growth in property crime.

However, the effect size will be negligible (.4%) compared to DPI's effect.

## 2.3 Sociotropic versus Egotropic

Most studies (Nannestad and Paldam 1994; Markus 1988) have found that voters seem to pay more attention to aggregate national economic growth than to their own financial circumstances, supporting the sociotropic hypothesis. However, previous studies have not been able to examine intermediate forms of the hypothesis – do voters consider primarily their *state's* well-being or their *nation's* well-being? The data offer a rare opportunity to test this, because they contain not only a cross-section of conditions in each of the 50 states, but also a time-series over 7 national elections on both DPI and crime rates. Based on previous support for the sociotropic hypothesis, I predict:

P3: Voters should weight national growth in crime and DPI more heavily than growth in their own states.

Implications of this prediction are discussed in the conclusion.

#### 2.4 Regression model

The following regression model was used to test the predictions above:

$$V_{i,t} = f(V_{i,t-1}, V_{i,AV}, \text{SecondTerm}_t, \text{DPI}_{i,\text{lag}}, \text{VC}_{i,\text{lag}}, \text{PC}_{i,\text{lag}}, \text{DPI}_{N,\text{lag}}, \text{VC}_{N,\text{lag}}, \text{PC}_{N,\text{lag}})$$

Where

$V_{i,t}$  = the incumbent party's share of the major 2-party presidential vote in state  $i$  during elections in year  $t$ .

$V_{i,AV}$  = the incumbent party's average share of the major 2-party presidential vote in state  $i$  from 1972-1996.

$\text{SecondTerm}_t = 1$  if the current president is running for a second term, 0 otherwise.

$\text{DPI}_{i,\text{lag}}$  = annual growth in state  $i$ 's Disposable Personal Income per capita for various lags prior to the election.

$\text{VC}_{i,\text{lag}}$  = annual growth in state  $i$ 's Violent Crime incidence per capita for various lags.

$\text{PC}_{i,\text{lag}}$  = annual growth in state  $i$ 's Property Crime incidence per capita for various lags.

$\text{DPI}_{N,\text{lag}}$  = annual growth in National DPI per capita for various lags.

$\text{VC}_{N,\text{lag}}$  = annual growth in National Violent Crime incidence per capita for various lags.

$\text{PC}_{N,\text{lag}}$  = annual growth in National Property Crime incidence per capita for various lags.

The function  $f$  is taken to be linear throughout this paper. The first three variables on the right hand side are control variables to account for statistical effects of previous election patterns in the state and the incumbent president's possible advantage.

Consistent with Abrams and Butkiewicz (1995), all regressions are estimated using

Weighted Least Squares (WLS) with weights proportional to population of each state. This properly weights the precision of estimates in each state.

Previous research is ambiguous about the lag structure of the independent variables. Smyth, Dua, and Taylor (1994) report strong evidence that lagged conditions rather than expected future conditions influence voters. Early studies (Fair 1978) concluded that voters are myopic, that they consider only the 3 quarters prior to election. Nannestad and Paldam (1994) suggest that the myopic result is an artifact due to the high correlations among lagged predictors. Later studies with more data (Abrams and Butkiewicz 1995; Peltzman 1990) have found 4-year lags, such that voters consider all changes since the previous election. We will test the best fitting lags for each independent variable.

### *2.5 Measurement*

All measures of crime are reported only once per year. The FBI's Uniform Crime Report indexes all crimes reported or known to police in each jurisdiction for 8 major types: murder (including non-negligent manslaughter), forcible rape, robbery, aggravated assault, burglary, larceny (over \$50) motor vehicle theft, and arson. Note that some error in measurement appears because the crime rates are reported for an entire calendar year, whereas elections occur two months prior to the close of the year. To the extent that voters can accurately forecast the crime rate for the remaining two months of the year, this is not a problem.

Yearly Disposable Personal Income per capita (DPI) comes from the Bureau of Economic Analysis, with midyear population estimates by the Census Bureau. Nominal

DPI was transformed to real 1997 DPI using the Consumer Price Index – U (all urban consumers).

The popular votes received by the two major parties in each state for the 7 presidential elections from 1972 to 1996 are published in the United States Statistical Abstract. These totals were transformed to the percent of the 2-party vote received by the incumbent party. Average voting record for each state was computed as the percent of the 2-party vote received by Democrats during presidential elections from 1972-1996. If the incumbent party in an election was Democratic, the long-term average vote share garnered by Democrats was used. If the incumbent party was Republican, the long-term average share for Republicans was used.

### **3. Empirical results**

#### *3.1 Responsibility for changes in income*

Table 1 shows the WLS regression coefficients that best predict voting results when only DPI per capita and control variables are considered, with a separate column for different lags  $i$ . The coefficient for the average vote  $V_{AV}$  is consistently positive and significant for all lags, indicating the substantial party loyalty shown by many states despite changes in DPI. The effect of a president seeking a second term tends to be small and insignificant in these data. Between 1972 and 1996, 3 incumbent presidents have been defeated when seeking another term, and 3 have been successful. Hence in recent years there is no evidence for the power of incumbency. The coefficient for national growth in DPI/capita is consistently positive and significant, but the coefficient for state growth in DPI/capita does not reach significance. We will return to this point later.

*Table 1.* Coefficients for WLS regressions predicting incumbent party's vote share  $V_t$  for presidential elections in year  $t$ .

	Lag=1 year	Lag=2 years	Lag=3 years	Lag=4 years
Constant	.18 (4.6)	.18 (5.3)	.02 (2.6)	.06 (1.6)
$V_{t-1}$	-.16 (2.4)	-.08 (1.4)	.18 (3.3)	-.05 (.9)
$V_{\text{long term}}$	.79 (8.5)	.68 (8.5)	.54 (8.1)	.69 (8.6)
Second Term (0=no,1=yes)	.00 (.9)	.01 (1.4)	.00 (.0)	.07 (6.4)
National DPI growth	.96 (3.5)	1.9 (6.2)	1.5 (13.2)	5.9 (9.7)
State DPI growth	.13 (.6)	.32 (1.2)	.15 (1.8)	.48 (1.3)
Adjusted $R^2$	.408	.538	.677	.541

Note: T-statistics are in parentheses.  $N=350$ ; weight used is state population divided by average state population; lag refers to number of years preceding the year of election.

Examining the adjusted  $R^2$  across the columns reveals a pronounced peak at a lag of 3 years. These results are close to those of Peltzman (1990) and Abrams and Butkiewicz (1995) who found a lag of 4 years, with the first year of the term being least important to voters because of the “honeymoon effect.” The adjusted  $R^2$  at the selected lag of 3 years is .677, more than double the variance explained by the control variables (.326). Hence voters appear to be strongly affected by the 3-year growth rate of DPI prior to the election, and use this to reward or punish incumbent parties for their performance. This confirms the prediction of the responsibility hypothesis for DPI, consistent with previous research. I next test the responsibility hypothesis for the crime rate.

### 3.2 Responsibility for changes in crime

To test the responsibility hypothesis for crime, I first exclude income variables to more clearly see the pattern of smaller effects for crime. Columns (1-4) of Table 2 present the regression coefficients when violent crime and property crime rates are added to the control variables, with income excluded for the moment. The coefficients for the control variables show results similar to Table 1 – the effect of the long-term average is large and significant, while the effect of seeking a second term is not. The coefficients for national violent crime are all significant and consistently negative. This confirms the responsibility hypothesis (P1) for violent crime.

*Table 2.* Coefficients for WLS regressions predicting incumbent party's vote share  $V_t$  for presidential elections in year  $t$ .

	(1) Lag=1 year	(2) Lag=2 years	(3) Lag=3 years	(4) Lag=4 years	(5) Lag=3 years
Constant	.17 (3.3)	.14 (3.6)	.13 (3.5)	.13 (3.5)	.10 (2.6)
$V_{t-1}$	-.30 (3.7)	-.23 (2.8)	-.37 (5.)	-.43 (5.7)	-.22 (3.1)
$V_{\text{long term}}$	1.11 (10.7)	1.02 (10.3)	1.23 (13.9)	1.30 (14.4)	1.1 (11.8)
Second Term (0=no,1=yes)	-.01 (1.3)	.00 (.4)	-.02 (1.6)	-.01 (1.5)	.00 (.0)
National DPI growth					4.82 (16.8)
State DPI growth					
National VC growth	-.29 (2.1)	-.29 (2.0)	-.78 (6.0)	-.98 (5.9)	-.19 (3.2)
State VC growth	-.00 (.0)	.06 (.8)	.06 (.7)	-.00 (.0)	
National PC growth	.08 (.4)	-.06 (.3)	.27 (1.6)	.51 (2.6)	
State PC growth	-.06 (.7)	-.21 (1.8)	-.08 (.6)	-.05 (.3)	
Adjusted $R^2$	.343	.387	.427	.417	.684

Note: T-statistics are in parentheses; N=350; weight used is state population divided by average state population.

In contrast, the 8 coefficients for property crime reach significance only once, and then have the wrong sign. This is consistent with predictions of (P2).

Examining the adjusted  $R^2$  in columns 1-4 shows again a peak at the 3-year lag. Hence both income in Table 1 and crime in Table 2 show highest predictive accuracy when 3-year growth rates are considered prior to the election. Later analyses will therefore use the 3-year lag specification.

### *3.3 Magnitude of crime's effect on voting*

Column 5 in Table 2 examines the joint effect of DPI and violent crime for the 3-year lag specification. As above, both coefficients are significant and have the correct signs. Hence the information added by crime is not redundant with that for DPI. The effect of an additional 1% annual growth in DPI over the 3 years prior to the election is worth an additional 4.8 percentage points in votes to the incumbent party. This is higher than the 2.3% reported by Markus (1988) for DPI, but he reported results only for a one-year lag.

The next row provides the first estimate for the effect of crime on U.S. presidential voting. The effect of an additional 1% increase in violent crime per year yields a loss of .19 percentage points in votes for the incumbent. Note that the effect of violent crime on voting is much smaller than that of DPI. Specifically, the relative magnitude of the violent crime coefficient to DPI is 4.0%, remarkably close to the relative magnitude calculated from Miller, Cohen and Rossman of 4.6%. This confirms (P1). Since Miller et al. calculate their result without any reference to voting functions,

this is a welcome convergence of evidence from two quite different economic methods. It suggests that voters settle up with candidates in proportion to the dollar value of gains or losses in violent crime and in DPI during the incumbent's term.

### *3.4 Sociotropic versus Egotropic*

A surprising result from Tables 1-2 is that the state-level measures of DPI and violent crime are all non-significant, while the national measures are all significant. This strongly confirms the sociotropic hypothesis (P3). However, the result conflicts with previous research (Abrams and Butkiewicz 1995; Peltzman 1990) where state-level income measures predicted the presidential vote well. Table 3 expands on this issue by using state conditions alone to predict votes. Six of the eight state coefficients are significant and all are in the expected direction. The pattern of lags is similar to Tables 1 and 2, with a peak  $R^2$  at 3 years. However, all  $R^2$ s are smaller than their corresponding  $R^2$  from Tables 1-2. This suggests that voters consider state conditions only as noisy proxies for national conditions, and that state conditions provide no additional information to voters on their choice for president.

The results from Table 3 successfully replicate results of Abrams and Butkiewicz (1995), and Peltzman (1990) who use state-level conditions to predict presidential votes. However, Table 2 extends their results by suggesting that they could further improve prediction by (1) adding violent crime, and (2) employing national conditions instead of state conditions. This pattern is robust across all time lags.

*Table 3.* Coefficients for WLS regressions predicting incumbent party's vote share  $V_t$  for presidential elections, using state-level measures of DPI and violent crime.

	(1) Lag=1 year	(2) Lag=2 years	(3) Lag=3 years	(4) Lag=4 years
Constant	.16 (4.1)	.17 (4.7)	.06 (1.9)	.10 (2.7)
$V_{t-1}$	-.20 (2.8)	-.14 (2.2)	-.05 (.9)	-.22 (3.4)
$V_{\text{long term}}$	.89 (9.5)	.80 (9.5)	.86 (11.0)	.99 (11.8)
Second Term (0=no,1=yes)	.00 (.1)	.01 (.6)	.03 (3.1)	.02 (1.9)
State DPI growth	.76 (5.8)	1.6 (10.0)	2.5 (11.6)	2.6 (8.3)
State VC growth	-.07 (1.5)	-.09 (1.9)	-.21 (4.4)	-.37 (5.8)
Adjusted $R^2$	.390	.492	.541	.468

Note: T-statistics are in parentheses; N=350; weight used is state population divided by average state population.

### *3.5 National voting predictions*

Table 4 displays the power of the best-fitting equations from column (5) of Table 2 to predict national voting results. Two measures of predictive power are shown. The first aggregates the prediction for each state to get predicted national popular vote. The second counts the number of states where majorities were predicted correctly – important in predicting electoral votes. Column (1) shows the error between predicted and actual popular vote when the national measures of DPI and violent crime from Table 2 column (5) are used as predictors. The mean absolute error was 2% of the vote, with maximum error of 3.4%. This is quite a low absolute error, implying that on average all but 2% of the popular vote can be predicted before the campaign even begins. The mean absolute error is lower than that reported by Marcus (1988), who used a similar cross-sectional time-series database to make predictions. The absolute error is also lower than Fair

(1996), who used only economic conditions to make predictions (though he reported average absolute error of 2.1%, just slightly higher than Table 4). Column 2 shows the number of states (out of 50) where the model correctly predicted which party would win a majority. The average number of states correctly predicted was 42.3, with a minimum of 30 in 1976.

*Table 4.* Error in prediction for best-fitting models using national or state-level measures of DPI and violent crime.

	National-level measures		State-level measures	
	(1) Error	(2) States correct	(3) Error	(4) States correct
1972	1.9	48	4.5	48
1976	-1.5	30	-2.6	30
1980	1.6	42	-0.4	43
1984	-3.0	49	0.1	49
1988	0.0	44	0.0	38
1992	-3.0	40	-5.5	28
1996	3.4	45	4.0	38
Mean Absolute	2.0	42.3	2.5	39.1

Note: Error is given in percent actual vote less percent predicted.

Columns 3-4 give corresponding error measures for the prediction equation in Table 3 that uses state-level measures of DPI and violent crime. Predictive power

declines for both error measures, echoing the results for adjusted  $R^2$ . Again, national-level measures predict presidential voting better than state-level measures.

#### 4. Conclusions

In contrast to examining surveys of QOL, I examine already-existing voting records to infer citizens' perceptions of QOL changes over time. The model holds that voters evaluate whether their QOL has improved (or declined) since the last election, and that they reward (or punish) the incumbent party accordingly. This is termed the responsibility hypothesis. I examine the popular presidential vote in the U.S. from 1972-1996 and show that changes in the domains of economics and of personal safety strongly affect election outcomes. The model allows inference on the relative importance that citizens place on the two domains. Based on these elections, the average voter considers the economic domain as much more important, with violent crime just 4% of the effect of a 1% change in real DPI per capita.

Though this 4% figure appears very small, the actual effect that violent crime has on elections is higher than 4% because the standard deviation of changes in violent crime is about 4 times higher than that of DPI. Hence the actual effect on voters due to violent crime in this period is 16% of the effect due to DPI. This is smaller than the effect of DPI, but still adds significantly to predictive power.

The results also provide strong support for an extension of the sociotropic hypothesis for both crime and DPI, that voters seem to use *national* economic and crime conditions to determine their support for the incumbent, ignoring unique conditions

within their own state. The result is consistent across various time lags and for predicting national vote totals as well as state totals.

The finding that voters pay attention only to national conditions in presidential voting gives further dimension to the “voting paradox.” We know that voters make the effort to vote, even though their likelihood of affecting the outcome is vanishingly small. Earlier research on sociotropic orientation also showed that voters ignore their own pocketbook in favor of national conditions. The current results extend these by showing that voters ignore even state-level conditions in favor of national conditions. That voters do not favor their own state over others seems to ignore an opportunity to extract more favors from the incumbent and to improve their own self-interest.

I caution, however, that the data in this paper are limited because only aggregate votes are observed. Hence the voting function can estimate preferences only for the “marginal voter” who can swing elections. These marginal voters may be more far-sighted in considering national conditions than the “loyal voter” who always votes for one party. Indeed, one mechanism to ensure the loyalty of more egotropic voters is for a party to grant continual favors to specific states whenever the party is in power. This would commit the egotropic segment of voters to one party, whereas the sociotropic segment would be the “swing” voters, who decide elections by monitoring how much the incumbent has improved national conditions.

Finally, the method outlined in this paper is a useful supplement to the method of custom-made surveys to measure national QOL. The German national QOL system (as well as the European Union and the Swedish systems, see Noll and Zapf 1994; Vogel 1998) custom-designs surveys to get citizen’s perceptions of QOL in many domains. The

present method does not require expensive surveys, but uses already-existing voting records and objective economic and crime data. The present method also has another advantage that Hagerty et al. (2001) considered essential in constructing a QOL index: it can estimate the importance weights that citizens apply to each domain. In contrast, no national QOL survey even attempts to measure weights. With these weights, it is possible to construct a national QOL index where domains are weighted by the importances provided by the average voter in the nation.

## REFERENCES

- Abrams, B. A. and Butkiewicz, J. L. (1995) The influence of state-level economic conditions on the 1992 U.S. presidential election. Public Choice 85: 1-10.
- Bureau of Justice Statistics (1993) Highlights from 20 years of surveying crime victims: The national crime victimization survey, 1973-92. Washington: U.S. Department of Justice.
- Fair, R.S. (1978) The effects of economic events on votes for president, Review of Economics and Statistics, 60: 159-173.
- Fair, R.S. (1996) Econometrics and Presidential Elections, Journal of Economic Perspectives, 10, 3, 89-102.
- Gallup, George Jr. (1997) The Gallup Poll: Public Opinion 1996. Scholarly Resources: Wilmington, DE.
- Hagerty, M.R., Naik, P. and Tsai, C.L. (2000) The Effects of Quality of Life on National Elections: A Multi-Country Analysis. Social Indicators Research, (Feb), 49.
- Hagerty, Michael R., Robert A. Cummins, Abbott L. Ferriss, Kenneth Land, Alex C. Michalos, Mark Peterson, Andrew Sharpe , Joseph Sirgy, Joachim Vogel (2001) Quality of Life Indexes for National Policy: Review and Agenda for Research", Social Indicators Research, 55, 1-96.
- Lewis-Beck, Michael S. and Martin Paldam (2000) Economic Voting: An Introduction. Electoral Studies, 19, 113-121.
- Markus, G.B. (1988) The impact of personal and national economic conditions on the presidential vote: A pooled cross-sectional analysis. American Journal of Political Science 32:137-154.

- Miller T.R., Cohen M.A., Rossman S.B. (1993) Victim Costs of Violent Crime And Resulting Injuries. Health Affairs, Winter, 12 (4):186-197.
- Nannestad, P. and Paldam, M. (1994) The VP-function: A survey of the literature on vote and popularity functions after 25 years. Public Choice, 79, 213-245.
- Noll, H. H. and W. Zapf: 1994, 'Social Indicators Research: Societal Monitoring and Social Reporting', in I. Borg and P. Mohler (eds.), Trends and Perspectives in Empirical Social Research. (Walter de Gruyter, Berlin/New York), pp. 1-16.
- Nordhaus, W.D., and J. Tobin (1973) Is Growth Obsolete? In The Measurement of Economic and Social Performance, (M. Moss, ed.) p.509-32, New York: National Bureau of Economic Research.
- Peltzman, S. (1990) How efficient is the voting market? Journal of Law and Economics (April) 33, 27-63.
- Rosenstone, S. J. (1985) Why Reagan won. Brookings Review, 3: 25-32.
- Smyth, D. J., Dua, P., Taylor, S.W. (1994) Voters and macroeconomics: Are they forward looking or backward looking? Public Choice 78, 283-293.
- Vogel, J.: 1998a, 'Welfare Surveys and Social Reporting in the Nordic Countries', I Statistik im Dienste der Öffentlichkeit. Bundesamt fuer Statistik (Bern, Schweiz).