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## An empirical study of politico-economic interaction in the US

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AN EMPIRICAL STUDY  
OF POLITICO-ECONOMIC INTERACTION  
IN THE U.S.

Bruno S. Frey  
Friedrich Schneider

DISKUSSIONSBEITRÄGE

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by

Bruno S. Frey and Friedrich Schneider

Summary

Popularity and reaction functions as the main relationships between the economic and political sectors are theoretically derived and empirically estimated with quarterly data for the U.S. One of the purposes is to endogenize government behavior in macro-econometric models.

Unemployment, inflation (negatively) and the growth of consumption (positively) influence presidential popularity. The presidents who fear not to be reelected use in turn their policy instruments (public expenditures and jobs) to increase their popularity. There is also some indication that the presidents pursue ideological goals when they are confident to win the upcoming election.

# AN EMPIRICAL STUDY OF POLITICO-ECONOMIC INTERACTION IN THE U.S.

by

Bruno S. Frey and Friedrich Schneider\*

## I. Introduction

To study the interactions between the economic and the political system is of obvious importance in a modern society in which the government has assumed a major role in economic affairs, and in which the population tends to make the government politically responsible for its material well-being. The government should no longer be regarded an exogenous entity outside the economic system.

These statements are of immediate consequence for econometric model building. As some authors have noted<sup>1</sup>, an econometric model may be subject to serious misspecification if an endogenous variable (such as government expenditures) is treated as if it were exogenous.

The study of politico-economic interdependence is also of crucial importance for forecasting. Present macro-econometric models in which the government is essentially exogenous (except for tax income) are of limited use for prediction, as the future course of economic events depends strongly on what actions the government is going to undertake.

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The knowledge of the relationships between the economy and the polity may also be of importance from a constitutional point of view (see Buchanan and Tullock 1962): the voters become better informed about the possibilities and constraints of political decision-makers, and are therefore better equipped to make a good choice.

The same applies to advisors on economic policy. Presently, they are often unsuccessful because they do not take into account the political repercussions on the government of the policies they suggest. A deflationary policy shortly before an election will e.g. hardly be adopted by a government because it would lead to a high risk of defeat. A politico-economic model helps the advisor to advance proposals which have a reasonable chance of actually being put into practice.

This study advances some simple theoretical hypotheses about the nature of the main interacting links between the economy and the polity, with special regard to the (central) government. The basic relationships are the popularity function describing the impact of economic conditions on the government, and the reaction functions describing how the government uses its policy instruments in order to steer the economy in the direction desired. These relationships are econometrically tested with quarterly data for the United States from 1953 to 1975.

The analysis shows that the government's (the president's) popularity is significantly reduced when the rate of unemployment and the rate of inflation rise, and that it is significantly increased when the growth rate of private consumption rises. The government reacts to changes in its popularity because it is taken as an indicator of future election

outcome. When popularity is low, the government tries to steer the economy such as to be more popular with the voters and thus to be re-elected, if it is high enough, the government can afford to pursue ideologically oriented policies, not necessarily popular with the voters. These political influences on (nondefense) government spending are undertaken within the framework of a government bureaucracy which has an interest in a regular increase of public outlays and employment and which opposes structural changes.

There has been a number of papers studying the influence of economic variables on election outcomes and on government popularity, most of which are not satisfactory on theoretical and statistical grounds. There are, on the other hand, only a few studies on government reaction functions. They are, moreover, either apolitical and interested in the implied weights of a welfare function (e.g. Friedlaender 1973), or relate only to a particular section of the economy (e.g. MacRae 1975, Wright 1974), and/or do not present any econometric estimates (e.g. Nordhaus 1975). The present paper is based on analytical and simulation studies by the authors (see e.g. Frey 1974).

## II. The Popularity Function

In a modern society, the population tends to make the government responsible for the course of economic events because the citizens believe that the government has the insight and capability to control the economy. The hypothesis is advanced that the government loses popularity if the rate of unemployment and the rate of inflation rise, and if the rate of

growth of consumption (or of disposable income) falls. This corresponds to the approach taken by Kramer (1971) in his pathbreaking study of election functions.<sup>2</sup> As has been pointed out by Stigler (1973) and by Fair (1975) this formulation implies that voters' rationality is rather limited: (a) they do not compare how well the other party (or parties) would have done under the same conditions; (b) they do not take into account whether the underlying economic conditions have been favourable or not; (c) they take current (or slightly lagged) economic conditions as the only basis for the government's evaluation.

It is reasonable to assume that a president's personality is reflected in the popularity series. For each president, a specific level of popularity is introduced, i.e. the constant of the regression equation is broken up into various parts.

As is well known, presidential popularity is subject to erosion over the term of office: Popularity depreciates autonomously. A dummy variable is introduced for each president (except for Ford for whom there are too few observations available) which rises over his term of office. Popularity depreciation is thus indicated by a negative coefficient. Nixon's depreciation variable refers to his first term (1969:I-1972: IV), only. Due to the overriding importance of the Watergate scandal, a special dummy depreciation variable (WAT) is introduced for his second (unfinished) term; this variable is designed to capture Nixon's dramatic loss of confidence with the population due to Watergate. This dummy takes the values 1, 3, 5, 5, 5 over the period 1973:II-1974: II, and is otherwise zero.



Eq. (1) shows the formulation of the presidential popularity function:

$$(1) \text{ Popularity} = \pi_1 (\text{inflation})_{t-1} + \pi_2 (\text{unemployment}) + \pi_3 (\text{growth of consumption}) + \Pi_L (\text{popularity level of each president}) + \Pi_D (\text{popularity depreciation for each president}) + \pi_{\text{WAT}} (\text{Watergate-var. for Nixon}) + \epsilon_t$$

It is assumed that all other economic and non-economic influences (such as foreign policy events) are random and thus included in  $\epsilon_t$ . The variables used above are more fully described in the appendix. Popularity is a data series regularly collected by the Gallup Poll, and gives the percentage share of the population "approving the way Mr. . . . handles his job as president." To facilitate the interpretation, the rates of inflation, of unemployment and of growth of consumption are also given in percent.

The theoretically expected sign of the coefficients in eq. (1) are  $\pi_1 < 0$ ,  $\pi_2 < 0$ ,  $\pi_3 > 0$ , and  $\Pi_D$  (for each president)  $< 0$ . Price rises are included with a one quarter lag, assuming that the consumers need some time before they notice an increase (or decrease) in the rate of inflation.

The simultaneous inclusion of the three economic variables may run into statistical difficulties as they are correlated among themselves. The correlation coefficient between the rates of unemployment UR and of inflation  $RP_{t-1}$  is 0.25, the one between unemployment and the nominal growth rate of consumption RCN is -0.29, and the one between the rate of inflation and the growth of consumption -0.56. Multicollinearity is thus

not so strong that it would make it useless to estimate eq. (1), but it is advisable first to estimate the popularity function by omitting one of the economic variables in turn. The result is shown in Table 1.

The estimates reported in Table 1 have a good statistical fit and there is no serial correlation. All the coefficients of the economic variables are statistically significant at the 95% confidence level; the parameter estimates correspond to a priori theoretical expectations and are remarkably stable. While the absolute level of each president's popularity is different in eq. (2) - (4), their relative size is stable e. g. Kennedy always having the highest level and Nixon the lowest. Only the joint popularity depreciation of Kennedy/Johnson corresponds to theoretical a priori expectations and is statistically significant, while it may be rejected that Eisenhower and Nixon (first term, only) suffered any autonomous popularity decline while in office. Watergate has, however, had a very clear effect on Nixon's popularity during his second term.

The estimation results of Table 1 suggest that the theoretical model captures the underlying structure reasonably well. It shows in particular that each one of the three economic variables has an important effect on presidential popularity. This contradicts the findings by Mueller (1970) for popularity functions (who includes in his regression equation unemployment as the only economic variable), the (corrected) estimates for election functions by Kramer (1971) (in whose estimate inflation is the only economic variable with a clearly significant effect), by Stigler (1973) (who denies the empirical existence of an election function as long as it does not refer to distributional issues), and finally by Fair (1975) (who maintains that the growth of real income is the only variable with any significant effect).<sup>3</sup>

Table 1: The effect of two economic variables on presidential popularity; 1953: II--1975: II.

eq.	Economic Variables			Popularity Factors										Test Statistics			
	Inflation RP <sub>t-1</sub>	Unemployment UR	Growth of Consumption RCN	Popularity level						Popularity depreciation				R <sup>2</sup>	d	σ <sub>e</sub>	ρ̂
				Eisenhower first term EI	Eisenhower second term EII	Kennedy K	Johnson J	Nixon N	Ford F	E	K/J	N	WAT				
(2)	--	-4.00 (-5.40)	0.71 (2.63)	83.63 (20.16)	80.67 (17.69)	104.5 (18.97)	93.35 (18.88)	73.00 (18.40)	79.71 (13.69)	0.11 (0.55)	-2.14 (-12.07)	0.10 (0.35)	-5.40 (-7.14)	0.90	1.97	3.96	0.22
(3)	-2.05 (-2.43)	--	0.85 (2.20)	70.02 (11.74)	66.95 (15.75)	76.36 (19.36)	69.92 (17.38)	63.15 (11.57)	76.20 (7.67)	-0.23 (-0.69)	-1.27 (-4.77)	-0.29 (-0.79)	-4.70 (-3.71)	0.90	1.99	3.92	0.25
(4)	-1.58 (-2.44)	-4.30 (-5.56)	--	89.90 (20.33)	88.16 (18.11)	109.31 (19.94)	99.37 (20.76)	83.68 (18.24)	99.50 (10.41)	0.11 (0.52)	-1.93 (-9.48)	0.14 (0.46)	-4.87 (-5.32)	0.90	2.00	3.98	0.31

The figures in parentheses are t-values. d indicates the Durbin-Watson coefficient, σ<sub>e</sub> the standard error of regression, and ρ̂ the coefficient of autoregression obtained through the Cochrane-Orcutt interaction procedure. There is only one depreciation dummy for Eisenhower, and for Kennedy and Johnson it is estimated jointly in order to increase the number of observations and to save space.

For the purposes of a politico-economic model it may be useful to show the influence of all three economic variables in one single equation in order to capture the "total" influence of economic conditions on the polity, as measured by the president's popularity. This is done in Table 2, where the effect of substituting the real (RCR) for the nominal growth of consumption (RCN) is also shown.<sup>4</sup>

Again, the statistical fit is good and there is no serial correlation. A comparison with Table 1 shows that in this particular case the multicollinearity existing between the economic variables does not affect much the size but only the reported statistical significance of the estimated coefficients: In a joint regression, the rate of inflation and the growth of consumption seem not to be statistically significant. It may also be noted that the coefficients of the personality factors are much the same as in Table 1, again the Kennedy/Johnson and the Watergate depreciation being highly significant. The inclusion of the growth of real consumption (instead of nominal consumption) changes the other coefficients very little. Both seem to do equally well, with a slight presumption in favor of nominal consumption<sup>5</sup>, suggesting that the population may not only have "money illusion" with respect to income but also with respect to expenditures, e.g. because higher prices due to inflation are (mistakenly) taken as indicators of better quality.

To summarize: A correct specification of a popularity function (and probably of an election function) should take into account the effects of both the economic situation and the particular personality of each president.<sup>6</sup> A one percent increase in the rate of inflation decreases

**Table 2: The effect of three economic variables on presidential popularity, 1953: II--1975: II**

eq.	Economic Variables				Personality Factors										Test Statistics			
	RP <sub>t-1</sub>	UR	RCN	RCR	Popularity level					Popularity depreciation					R <sup>2</sup>	d	σ <sub>e</sub>	ρ̂
					EI	EII	K	J	N	F	E	K/J	N	F				
(5)	-1.00 (-1.98)	-4.03 (-5.23)	0.52 (1.69)		86.20 (17.91)	84.08 (15.72)	105.6 (17.93)	95.04 (17.43)	77.96 (13.77)	91.59 (8.75)	0.08 (0.37)	-2.00 (-10.02)	0.12 (0.38)	-4.84 (-5.44)	0.91	1.98	3.94	0.29
(6)	-0.97 (-1.22)	-4.20 (-5.44)		0.36 (1.67)	87.96 (19.08)	86.14 (16.97)	107.2 (18.87)	96.87 (18.92)	80.80 (15.98)	96.34 (9.84)	0.09 (0.41)	-1.95 (-9.59)	0.12 (0.39)	-4.65 (-5.01)	0.91	1.99	3.96	0.31

presidential popularity by one to two percentage points; an increase of unemployment by one percentage point decreases popularity by somewhat more than four percentage points; and an increase of the growth rate of nominal consumption increases presidential popularity by about seven-tenth of a percentage point.

### III. The Reaction Function

The reaction function describes the second major link of interdependence between the economy and the polity: It shows how the government (the president) influences the state of the economy in order to stay in power, or--if a reelection is considered likely due to high current popularity--to put his ideological views into practice. In terms of a macro-econometric model, the reaction functions are endogenous with respect to government instruments, particularly public expenditures. Presidential popularity, whose determinants were empirically estimated in the last section, is one of the major forces influencing governmental expenditure decisions.

Following the tradition in economic theory, it is assumed that the government maximizes its own utility subject to constraints. This assumption deviates fundamentally from the one still sometimes explicitly or at least implicitly advanced, namely that the government seeks to maximize the happiness of the population. The government (or in our case, the president) derives utility from the fact of putting his ideological views into practice. For the United States it seems appropriate to attach specific ideological views to each president.<sup>8</sup> The presidents are subject to three major constraints on their behavior:

(a) Government bureaucracy constraint. As in the case of the government it is realistic to assume that the bureaucracy is not simply following the wishes of the presidents but rather tries to maximize its own utility. The members of a public bureaucracy tend to resist any structural changes in expenditures because this threatens to destroy the positions of their now powerful members. They have, moreover, a clear interest in the continuous expansion of expenditures and of jobs as this increases the influence and income of the present members.<sup>9</sup>

This constraint facing the government may be formulated in two different ways:

(i) it may be assumed that the government is able to influence only marginal or incremental expenditures, i.e. established items and programs are largely outside of its control;

(ii) past expenditures determine current expenditures.<sup>10</sup>

In this paper, due to reasons of space, only the estimates with formulation (i) will be presented. The incremental hypothesis is shown here because it is more difficult to get good fits and the statistical tests are readily applicable.<sup>11</sup>

(b) Budget Constraint. Tax receipts may be considered to constitute the budget constraint within which the government may operate. Even more than private consumers, it has, of course, the possibility of borrowing and (in the case of some governments at least) of simply printing money. Tax revenue is therefore no absolute constraint on expenditures, but it is still of considerable importance as the borrowing possibilities and conditions may depend strongly on a "reasonable" relationship between

tax revenue and expenditures. This is particularly true for the United States, in which the financial community and the public at large seem to a considerable extent to be committed to the philosophy of a "balanced budget."

The theoretical assumption to be tested is that government expenditures are positively related to government receipts (GRE). It should be noted that this hypothesis clashes in many instances with the simple Keynesian prescription of anti-cyclical expenditures.

(c) Reelection constraint. Within the framework of a politico-economic model, the most important constraint on government behavior is that politicians want to stay in power. They can put their ideological views into reality only if they are and remain in office.<sup>12</sup> Current popularity is used as a convenient and widely observed indicator of the probable election outcome, provided the underlying conditions do not change strongly.

It is assumed that a president can be confident of reelection if a certain target popularity share ( $POP^*_g$ ) of, say, 58% is reached or surpassed.<sup>13</sup> (The exact percentage figure is of little importance; it depends on the president's degree of risk aversion and the exact structural conditions of the presidential race, e.g. if the president expects to be opposed by more than one serious contender, the target percentage may be lower.)

The dynamic maximization problem (or even differential game) as set up would, of course, be much too complex for any government to solve.



Rather it is assumed that a satisficing strategy is used which differentiates between two basic states:

(1) State of popularity deficit. Current popularity (POP) is smaller than the target (POP\*) and the president fears he will not be reelected if conditions do not change. He therefore undertakes expansionary policies by increasing public expenditures and government employment, expecting that the induced changes in the state of the economy will increase his popularity with the voters and secure reelection. This expectation is realistic: The empirical estimates of the popularity function indicate that a decrease of unemployment and an increase in the rate of growth of consumption indeed lead to a popularity rise if the possible concomitant increase in the rate of inflation is not extremely high.

It is reasonable to assume that the government's reaction to a popularity deficit will be much stronger, when the gap is large than when it is small. The size of the change of public expenditures and jobs, is therefore taken to be proportional to  $(POP-POP*)^2$ , for  $POP < POP*$ , and a positive coefficient is theoretically expected. As there is certainly a maximum amount by which the government succeeds in changing public expenditures and jobs within any quarter, it has (somewhat arbitrarily) been assumed that the squared popularity deficit determines government behavior only if it is smaller than 530 units. (This case is relevant only during the quarters in which Nixon's popularity was so extraordinarily low due to Watergate.)

As current popularity is an indicator of future election outcomes, the government will certainly react much more strongly when the popularity deficit appears shortly before the election date than a long time before. The time before an election is reflected in a dummy variable, TBE, which takes the values 1, 2, 3. . . 8 starting with the beginning of the second half of each presidential term and ending one quarter before the election date. As the expansionary measures are (cet. par.) assumed to be the higher, the nearer the election (given  $POP < POP^*$ ), a positive coefficient is expected. (For  $POP \geq POP^*$ ,  $TBE = 0$ ).

(2) State of popularity surplus. When current popularity is equal or higher than necessary for reelection ( $POP \geq POP^*$ ), the president has the possibility to put his ideological views into practice. It may again be assumed that he will seize this opportunity increasingly as the surplus becomes larger. The variable for each president's ideology is equal to 1 and multiplied by the "room" available to the president, formulated as  $(POP - POP^*)^2$ . (For  $POP < POP^*$ , this variable is zero.) Within the framework of this politico-economic model, it is not possible to advance any a priori hypothesis about the sign of the corresponding parameters.<sup>14</sup>

It is now possible to state the regression equation:

$$(7) \Delta \text{ INSTR} = \text{const.} + \rho_1 \Delta (\text{government receipts})_{t-1} + \rho_2 (\text{squared popularity deficit})_{t-1} + \rho_3 (\text{time before elections}) + \rho_4 (\text{each presidents ideology}) + u_t.$$

The variables are more fully explained in the appendix, they all refer to the federal government. The change in receipts and the popularity deficit are lagged by one quarter, as the government needs time to react.

The instruments (INSTR.) considered are:

- GX :           nondefense exhaustive government expenditures  
                  (current);
- TR :   government transfers to private households (current);
- JOB:   number of civilian government jobs.

$u_t$  is a random variable. The theoretically expected signs of the coefficients are  $\rho_1 > 0$ ,  $\rho_2 > 0$ ,  $\rho_3 > 0$ .

Table 3 reports the regression estimates for the whole period of 22 years.

Taking into account that the regression does not relate to absolute values and that there is no lagged endogenous variable included, the statistical fit is quite satisfactory but there may possibly be serial correlation in eq. (8) and (10).

All coefficients relating to political factors have the theoretically expected positive sign. Government receipts are statistically significant in the case of government expenditures for goods and services, transfers and jobs. One of the most important determinants from the point of view of a closed political-economic model, the popularity deficit, is of significant influence for all three expenditure categories considered. For the United States in the period considered, therefore, there is empirical evidence suggesting that economic conditions influence presidential popularity, which in turn motivates the use of policy instruments and thus shape to a considerable extent general economic conditions.

Table 3: Reaction functions, 1953: II--1975: II

eq.	Dependent variable	Consf.	Political factors			Ideology				Test Statistics			
			$\Delta GRE_{t-1}$	$(POP_{t-1} - POP^*)^2$	TBE	E	K	J	N	$R^2$	d	$\sigma_e$	$\hat{\rho}$
(8)	$\Delta GX$	0.49 (0.73)	0.17 (2.47)	0.002 (2.08)	0.26 (2.20)	-0.0003 (-1.79)	0.0004 (1.88)	-0.004 (-2.10)	-0.003 (-1.66)	0.87	1.43	0.55	0.91
(9)	$\Delta TR$	7.04 (1.66)	0.20 (2.60)	0.003 (2.34)	0.05 (0.61)	0.0008 (0.51)	-0.00008 (-0.56)	-0.0009 (-0.66)	-0.0008 (-2.66)	0.78	2.49	0.32	0.98
(10)	$\Delta JOB$	539.13 (4.20)	3.89 (1.99)	0.03 (2.41)	1.39 (0.27)	-0.04 (-0.37)	-0.08 (-0.88)	0.41 (2.31)	-0.06 (-0.76)	0.90	1.48	109.3	0.96

As the column referring to TBE shows, presidents tend significantly to increase exhaustive government expenditures before elections. It is somewhat surprising that the regression results do not show a similar behavior with respect to the other two policy instruments.

The coefficients relating to the ideology variable are mostly negative but in quite a number of cases not statistically significant. They are significant only in a few cases, two of which are for Nixon who seems to have followed (cet. par.) a restrictive economic policy compared to other presidents.

Table 4 shows the regression estimates for the three subperiods of the Eisenhower administration, for the joint administration of Kennedy and Johnson and finally for the joint administration of Nixon and Ford. Due to the use of quarterly data there are sufficient observations for meaningful statistical tests.

The subperiods presented in Table 4 reveal the same general picture as the overall period (Table 3). The model is, however, unable to account for any large share of the variance in the case of Eisenhower's transfers and jobs. In the other equations between 60% and 90% of the variance is statistically explained by the reaction functions derived. Serial correlation is absent, except in eq. (16) and (17). The popularity deficit is highly significant in half of the equations, and the same is true for the budget constraint ( $\Delta$ GRE). All presidents are influenced in their spending behavior by upcoming elections. The instrument used being exhaustive expenditures (Eisenhower, Nixon/Ford) or transfers

Table 4: Reaction functions for the various presidential administrations, 1953: II--1975: II

eq.	Administration	Dependent Variable	Const.	Political Factors			Ideology		Test Statistics			
				$\Delta GRE_{t-1}$	$(POP_{t-1} - POP^*)^2$	TBE			$R^2$	d	$\sigma_e$	$\hat{\rho}$
(11)	<u>Eisenhower</u> (1953:II-1960:IV)	$\Delta GX$	0.39 (0.51)	0.24 (2.11)	0.02 (1.84)	1.08 (2.20)	-0.0003 (-1.81)		0.83	1.45	0.52	0.87
(12)		$\Delta TR$	0.38 (5.62)	0.08 (2.63)	0.01 (2.02)	0.15 (0.61)	-0.0003 (-0.70)		0.27	1.90	0.24	--
(13)		$\Delta JOB$	275.47 (3.23)	11.26 (0.85)	0.06 (0.03)	4.90 (0.08)	-0.01 (-0.13)		0.26	1.61	62.9	0.86
	<u>Kennedy- Johnson</u> (1961:I-1968:IV)						<u>Kennedy</u>	<u>Johnson</u>				
(14)		$\Delta GX$	1.34 (1.26)	0.29 (2.18)	0.001 (1.73)	0.06 (0.92)	0.0003 (1.82)	-0.005 (-1.91)	0.86	1.72	0.49	0.90
(15)		$\Delta TR$	0.65 (4.60)	0.11 (2.82)	0.002 (2.16)	0.10 (3.03)	-0.0008 (-1.69)	0.00009 (0.06)	0.81	1.69	0.30	--
(16)	$\Delta JOB$	651.13 (5.12)	10.61 (0.89)	0.03 (1.89)	9.87 (0.93)	0.07 (0.96)	-0.42 (-1.69)	0.92	1.25	4.52	0.93	
	<u>Nixon-Ford</u> (1969:I-1975:II)						<u>Nixon</u>					
(17)		$\Delta GX$	2.51 (1.26)	0.15 (2.05)	0.0007 (1.78)	0.24 (1.83)	-0.0009 (-1.06)		0.87	1.17	0.61	0.94
(18)		$\Delta TR$	9.12 (2.02)	0.04 (0.87)	0.003 (2.34)	0.07 (0.28)	-0.02 (-2.55)		0.56	1.78	0.21	0.94
(19)	$\Delta JOB$	1016.01 (1.97)	8.56 (1.69)	0.04 (1.73)	1.03 (0.16)	-0.05 (-1.82)		0.84	1.57	48.7	0.98	

In eq. (12) and (15) the Cochrane-Orcutt iteration is not used, as the OLS-estimate shows no serial correlation.

(Kennedy/Johnson). Job creation is not employed for this particular purpose on any large scale. The ideology variables are in many cases statistically insignificant but mostly have a negative sign, indicating that American presidents tend to restrict expenditure increases when they are free from political constraints

#### IV. Concluding Remarks

The model of the interaction between the economy and the polity (government) presented in this paper is extremely simple; it can at best be considered a first step towards the formulation of a realistic model of political-economic interdependence. A great many important aspects are obviously still missing, such as the relationship between the government (president) and parliament (congress), the Central Bank (Federal Reserve System), economic and other interest groups, a more explicit account of government bureaucracy and its relationship to particular sectors of the economy (e.g. the department of agriculture to the farm sector), and many other aspects.

Taking account of the simplicity of the model and its preliminary character, the econometric estimates give quite reasonable results. The popularity function is able to explain a large share of the variance. It indicates that unemployment, inflation, and growth of consumption have a significant influence on presidential popularity.

The estimation of governmental reaction functions is confronted with many problems. The theoretical hypotheses advanced are, on the whole, not refuted by the empirical evidence: in particular, governments take account of their popularity when using the economic policy instruments.

When they fear they may lose an election, they make an effort to influence the economy in order to increase their popularity and chances of reelection. Some instruments are also used with increasing intensity as elections become nearer. There is also some indication that when presidents are confident of winning the upcoming election, they can allow themselves to act according to their ideological views.



## Appendix

### Definition and data sources

Presidential popularity (POP): Monthly series in percentage shares; 1953-1970 from the Gallup Opinion Index, Report No. 56, Feb. 1970, thereafter from the Reports No. 57-121, March 1970-Aug. 1975. The data used are averages over the three months of each quarter.

Civilian unemployment rate (UR): percentage points; rate of price inflation (RP): implicit price deflator for domestic sales inclusive of indirect business taxes, 1958 = 100, percentage rates; growth rate of nominal consumption (RCN), percentage rate; growth rate of real consumption (RCR), percentage rate. These economic data are taken from R.C. Fair, A Model of Macroeconomic Activity, Vol. II: The Empirical Model. Ballinger Publ. Co., Cambridge, 1975, pp. 37, 39, 41, 82/83.

Federal nondefense government purchases of goods and services (GX), current, in bil. \$. Survey of Current Business, 39-55 (1960-1975), section: Finance.

Transfer payments from the government sector to the household sector (TR), current; number of civilian jobs in the government sector (JOB), in thousand. Both from R. C. Fair, op. cit., pp 37, 43.

Federal government receipt (GRE), current, national income and product account basis. Survey of Current Business Statistics, op. cit.

The variables UR, RP, RCN, RCR, GX, TR, JOB and GRE are seasonally adjusted.

## Footnotes

1. See Crotty (1973), Goldfeld and Blinder (1972), Blinder and Solow (1974), pp. 69-7.
2. Kramer also presents a survey of previous research on election functions. There are only a few estimates of the popularity function for the U.S., the most notable being by Mueller (1970). That particular study is, however, marred by serious shortcomings, both of a theoretical (there is e.g. only one variable, unemployment, representing economic influences) and of a statistical nature (there is very strong serial correlation of residuals).
3. It must, of course, be noted that these studies partly refer to quite different time periods.
4. Alternatively, the growth rate of nominal and real disposable income has been included, yielding comparable results in terms of the size and level of statistical significance of all parameters.
5. This is also based on a comparison of estimates corresponding to those of Table 1, which due to space are not reproduced here.
6. When the personality factors are excluded, the coefficient of unemployment and of the growth of consumption (or of income) become insignificant, and the  $R^2$  drops sharply.
7. This behavioral assumption has been theoretically explored by Frey and Lau (1971).
8. For other countries it may be sufficient to differentiate between a right-wing and a left-wing ideology.
9. See Downs (1967), Tullock (1965), and Niskanen (1971).
10. This behavioral assumption has been used by Wildavsky (1964) in his empirical studies.
11. It may be argued that the use of first differences (incrementals) does not completely eliminate the time trend because (at least some) expenditure components are rising at a constant relative rate (or even more quickly). The explicit inclusion of a time trend in the regression equation has little or no effect, however, the respective coefficient is statistically insignificant.
12. American presidents almost invariably seek reelection. Even after having served two terms they are under strong pressure from their party (and especially their vice-presidents) to pursue policies as if they were seeking another reelection, i.e. which makes it likely that their successor will be a member of their own party.

Footnotes (continued)

13. Luce and Rogow (1956, p. 93) suggest e.g. on the basis of a game theoretic analysis that it is optimal to reach between 51% and 66% of the vote.
14. This could require an analysis of each president's ideological conceptions and of his preferences for the use of policy instruments (if any). This goes outside the scope of the Public Choice approach here pursued.

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