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A FISCAL MODEL OF PRESIDENTIAL ELECTIONS IN THE UNITED STATES: 1880–1980*

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Abstract

The paper presents a model in which the re-election of presidential incumbents is a negative function of increases and accelerations in federal expenditures relative to Gross National Product. Data on 26 elections held between 1880 and 1980 tend to support this hypothesis. We also find that the fiscal-electoral system of the United States exhibits homeostatic behavior similar to those of economic and physical systems.

Introduction

The relations between electoral variables, economic conditions, and fiscal and monetary policies are of interest to political scientists and economists (Kramer, 1971; Niskanen, 1979; Tufte, 1978; Hibbs, 1982). In this paper, we limit our inquiry to the interrelations between changes in the ratio of federal expenditures to Gross National Product and election results for President. We present a simple theoretical construct which helps to explain the outcome of 21 of the last 26 presidential elections during the last 100 years. It also yields a number of important insights into the workings and history of the fiscal-electoral system of the United States.

Given the limitations of time and space, we have chosen to specialize in a purely fiscal explanation of presidential elections. We realize, however, that a complete explanation of presidential elections will

have to include non-fiscal variables in an eclectic attempt to synthesize various theories. Although such a task is beyond the scope of this paper, we hope that a reader will be stimulated to do just that.

The Variables

The variables of our model are the following:

(1) Total federal expenditures relative to Gross National Product.

$$F = \frac{Federal\ Expenditures}{GNP}$$

(2) The relative change in F between presidential elections

$$\dot{\mathbf{F}} = \frac{\mathbf{F_t} - \mathbf{F_{t-1}}}{\mathbf{F_{t-1}}}$$

where t is an election year, and t-1 is the previous election year.

(3) The rate of change in F between presidential election years,

$$\ddot{\mathbf{F}} = \dot{\mathbf{F}}_{t-1} \dot{\mathbf{F}}_{t-1}$$

If \ddot{F} is positive, it represents an acceleration in \ddot{F} and, if negative, a deceleration.

- (4) The percentage of the vote received by the incumbent president or party, V.
- (5) Outcome of the election, E. Reelection of the incumbent is represented by a plus one (+1) and defeat by a minus one sign (-1). This +1, -1 variable conveys the sense of election outcome, but not the magnitude.

Fundamental Relationships

We submit that V is a negative function of F as shown in Figure 1. We reason that

^{*} An earlier version was presented before the Southern Political Science Association, Atlanta, October 29, 1982.

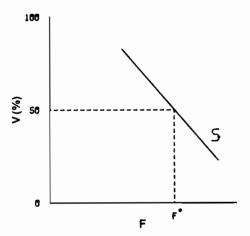


Figure 1. Expenditure-Votes Relationship

the establishment of government where there is none (F = 0 in Figure 1) meets nearly universal approval from the citizenry. Those who organize government capitalize on this support. But once expenditures rise beyond a trivial amount, support for the incumbents erodes due to taxpayer resistance, disagreements about the relative distribution of budget outlays, and greater political competition. In a democracy, this loss of support is manifested in a smaller V for the incumbent administration.

Our hypothesized support function is analogous to the demand curve in economics. The first law of demand says that as price increases, the quantity demanded falls. Similarly, as expenditures increase the opportunity costs of budget outlays rise, causing loss of support for the incumbents. Hence, the fiscal support function has a negative slope, as shown in Figure 1.

Government expenditures will tend to increase in response to pressures from the bureaucracy, interest groups, professional politicians, and segments of the general public. This growth is constrained, however, by the desire of the incumbents to be reelected. Thus the incumbents are faced with two conflicting fiscal pressures. Figure 1 shows an equilibrium level of expenditures F* at a V of approximately 50 percent. This is the share of the vote required for reelection. Beyond F* the incumbents are defeated: this induces them to keep expenditures from exceeding that point. The closer F is to F* the more precarious the fiscal-electoral equilibrium becomes.

The equilibrium nature of the model is another attribute shared with economic theory. In economics, the price of a commodity tends to rise or fall until the quantity demanded is equal to the quantity supplied. Similarly, expenditures tend to increase or decrease until the vote received by the incumbents and their opponents is about the same.

So far we have examined static conditions only. Over time the support function shifts in response to changes in income, economic conditions, the threat or occurrence of war, changes in public philosophy, and the rise or fall in the popularity of public figures. According to "Wagner's Law of Increasing State Expenditures," F* will tend to rise over time due to greater income, urbanization, density, and related variables (Buchanan and Flowers, 1980). Peacock and Wiseman (1961) as well as Kendrick (1955) argue that the "displacements" of F* caused by wars or depressions are never fully offset after the end of the war or economic recovery. Thus there may be forces which continually push F* to the right in the long run. This tendency is analogous to the physical law of entropy, according to which changes are, in the net, in the same direction (Georgescu-Roegen, 1971).

A Fiscal Hypothesis About Presidential **Elections**

We hypothesize that E is negatively related to both F and F. The linkage between E and \dot{F} is direct. As E (a + 1, -1 variable) is positively correlated to V and dV/dF (the slope of S in Figure 1) is negative, dE/dF must likewise be negative. Should dF/dt be positive (as it must be when F is positive), dE/dt will be negative. Should F be negative, dE/dt will be positive. E and F are thus negatively related.

A linkage between E and F cannot be rigorously derived unless the sign of the second derivative of figure 1 is specified. It is mathematically possible to have F and F positive, zero, or negative in any combination. We hypothesize a negative E-F linkage based on a fiscal trend perception by the voters. If a government acts to slow the rate of expenditure increase (F negative, even though a positive F indicates fiscal expansion), V (thus E) increases. If a government acts to slow the rate of relative fiscal decrease (F positive while F is negative), V falls. Thus we hypothesize that F and F significantly affect the outcome E. The pressures to spend are such that the budget is seldom going to be much below F*. Hence any increases in F or its rate of growth is not only going to reduce the margin of incumbent victory, but negate the likelihood of incumbent survival.

It is hypothesized that:

If sign (F, 1) + sign (F, 1) > 1, then E < 0, Otherwise, E > 0;

where sign (X, 1) = +1 if X > 0 and -1if X < 0. Examining the F and F possibilities.

- (1) If both F and F are negative, E will be positive (reelection).
- (2) If both F and F are positive, E will be negative (defeat).

- (3) If one of the variables is positive and the other negative, E will be positive.
- (4) If one of the variables is close to zero, E will be of opposite sign to the nonzero variable.
- (5) If both F and F are zero, E will be positive.

It should be noted that we give the benefit of reelection to the incumbent when F and F have opposite signs. We expect that, unless there is an unbalanced fiscal indicator of defeat, the electoral advantages of being in office provide reelection advantage to the incumbent.

The Data Set

Kendrick (1955) provides yearly data on federal expenditures and Gross National Product beginning in 1869. We have chosen the 1880 election as the first in the series, however, in order to avoid the aftereffects of the Civil War and Reconstruction. Summary data on all the variables between 1880 and 1980 is given in the appendix.

Figures 2, 3, and 4 show the values of F, F, and F, respectively, since 1880. As Figure 2 shows, F was relatively stable be-

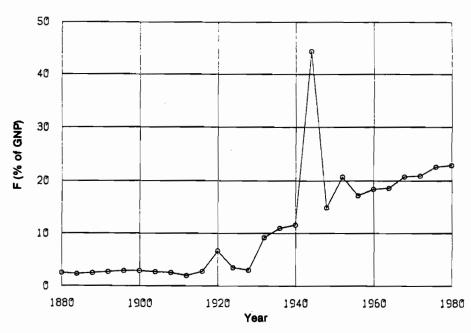


Figure 2. Federal Expenditures/Gross National Product, 1880-1980

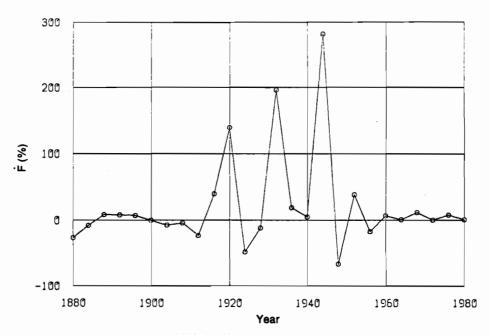


Figure 3. Relative Changes in F, 1880-1980

tween 1880 and 1912, ranging from 2.0 to 3.4 percent. Between 1916 and 1956, F experienced steep increases or declines during two world wars, the Korean conflict, and the Great Depression. Figures 3 and 4 show the behavior of F and F during the same period. Note the large shifts of these indicators during the displacements caused by war and depression.

As shown in Figure 2, F has on average been growing at roughly the same rate (slightly above one percentage point per

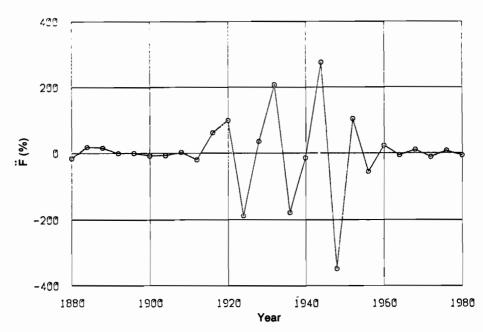


Figure 4. Relative Accelerations in F, 1880-1980

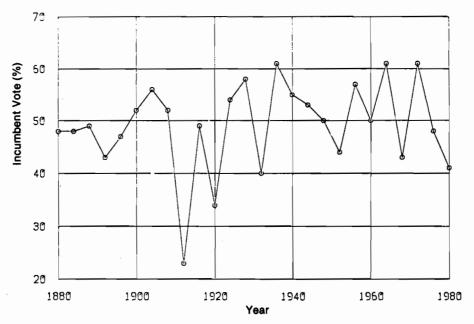


Figure 5. Percentage of Vote Won by Incumbents, 1880-1980

election) since 1912. The positive rate of relative fiscal growth is seen in Figure 3 in that F has been positively significantly more often than negative. Figure 4 shows that for every acceleration there has followed a roughly equivalent deceleration. This indicates that in the long term, relative growth in F has been at essentially a constant rate.

Figure 5 shows the values of V between 1880 and 1980. Note that V was relatively stable between 1880 and 1908, ranging from a low of 43 percent in 1892 to a high of 56 percent in 1904. Beginning in 1912, V also experiences large shifts, from 23 percent in that year and 34 percent in 1920 to 58 percent and 61 percent in 1928 and 1936, respectively. Thus, the period of "displacement" characteristic of F, and F, also is observed for V. The 1956-1980 period falls between the pervious two in stability.

Hypothesis Testing

Table 1 arranges all 26 administrations between 1880 and 1980 according to F and F during each term, and shows the subsequent election result. Each administration is labeled according to party, R for Republican and D for Democrat, followed by (+) or (-) depending on whether they were re-elected or defeated. F and F are grouped as positive, negative or minimal change.

The table yields the following information:

- (1) Approximately 80 percent of the administrations that decreased, decelerated, or both, were reelected.
- (2) In contrast, only about 33 percent of administrations that increased or accelerated were reelected.
- (3) The smallest percentage of reelection - 22 percent - is found among administrations that simultaneously increased and accelerated.
- (4) The ratio of reelections to defeats in the group that increased and accelerated is roughly the reverse of the ratio in the group that decreased or decelerated.
- (5) Administrations in which F and F moved in opposite directions had the same rate of reelection (80 percent) as those in which both variables were negative.

According to the hypothesis, administrations in which F, F or both are nega-

Table 1 F, F and Re-election (+) or Defeat (-) of Incumbents, 1880-1980. (Percentage Re-election in Parentheses; R = Republican, D = Democrat).

Ë		F (percentages)		
(percentage) points		- 2 ≤ F ≤ 2		Re-elections Elections
	1880 R + ^a	1900 R+	1936 D+	
	1904 R+	1964 D+	1940 D+	9/12
$\ddot{F} < -2$	1912 R –	1972 R+	1,740 25 1	J, 12
- ' -	1924 R+	1980 D -		(80%) ^a
	1948 D+			(33.3)
	1956 R+			
	(80%) ^a	(75%) ^a	(100%)	
			1892 R-	
			1896 D –	0/2
				(0%)
			(0%)	
	1884 R –		1888 D-	
	1908 R+		1916 D+	4/12
F̈ > 2	1928 R+	1	1920 D-	
		1	1932 R -	(33%)
			1944 D+	
			1952 D-	
			1960 R –	
			1968 D-	
			1976 R	
	(67%)		(22%)	
Reelections/	7/9	3/4	4/13	14/26
Elections	(78%)	(75%)	(31%)	(54%)

^a Since 1880 is the first election in the series we cannot compute F for it. Source: Appendix

tive should be reelected while those in which one variable is positive but neither variable is negative should be defeated. This means that, in Table 1, administrations in cells 1, 2, 3, 4, 5, and 7 should all have been reelected and all those in cells 6, 8 and 9 defeated. (We have separated these two sets of cells by a heavy line; note that cells 4, 5 and 8 are empty).

21 of the 26 cases conform to the hypothesis. The probability that is this result is a random occurrence is only 1 in 800.

The Exceptions

Five elections do not behave according

to our expectations. Two (1916, 1944) involve a simultaneous increase/acceleration that should have resulted in defeat and three (1884, 1912, 1980) are decreases and/or decelerations that should have been followed by reelections. The former two took place during war periods. In 1916, what became World War I threatened to engulf the United States and in 1944 America was in the midst of World War II. Thus these two exceptions are not difficult to understand, given the tendency of F* to be "displaced" by large wars.

Less obvious are the latter three exceptions. Perhaps historians can find some important variable which these three cases have in common that the other elections do not. For example, Lichtman and Keilis-Borok (1981) show that disunity within the incumbent party, as reflected in a serious contest for the nomination, is strongly associated with defeat. Such disunity characterized the incumbents in these three cases.

Of course, no model can explain all relevant cases, and we did not set out to do that. Our purpose from the start was to see how well two fiscal variables could explain election results. We found an 80 percent success rate.

The Equations of Reelection or Defeat

We have treated the variables V, and F as continuous. Regressing and F on V we obtained the expected negative coefficients but with inconclusive statistical significance. Though the percentage point vote loss due to increases in F and F can be calculated, the resultant slope is not statistically defensible.

Transforming V, F and F into discrete variables, E, \vec{F} and \vec{F} improves the level of statistical significance. E is 1 if the incumbent party was reelected, -1 if not. \cdot and \ddot{F} are -1 if the continuous value was less than -2, 0 if between -2and 2, and 1 if greater than 2. This procedure eliminates the distortion caused by outlying values while retaining the qualitative nature of the data points.

The equations estimated with the use of the transformed variables are shown in Table 2. By virtue of the computation, E must be estimated as a continuous variable: if E is positive, reelection is predicted; if negative, defeat. The closer the estimate of E is to zero, the less predictable the outcome. Note that the equations essentially restate the basic hypothesis: when F and F are large (1 in the discrete form) defeat of the incumbents is predicted.

Related Observations

Appraisal of the data base provides additional insights into the relations between E, F and F. A portion of the observations reinforce in an explicative manner the basic hypothesis tested earlier. Other observations merely illustrate what we consider to be informative political behavior. We include six such data observations in this paper recognizing each to be only a small portion of any complete evaluation.

Observation 1: Normal and Displacement Periods

In Table 2 we divided the data into normal (1880-1912; 1956-1980) and displacement (1916-1952) periods. The latter shows large shifts in F and F immediately prior, during, and after war, and during the Great Depression. Note that the gen-

	Table 2			
Election Equations	Using Discrete	Variables	E, Ė	and F

	Sample			Mean Values		
Period	Size	E Estimate	Significance	E	Ė	Ë
All	26	$0.08 - 0.50 \dot{F}$	0.025 - 0.05	0.077	0.154	0.000
		$0.15 - 0.48\ddot{F}$	0.01 - 0.025			
		$0.12 - 0.31 \dot{F} - 0.37 \ddot{F}$	0.01 - 0.025			
Normal	15	$0.16 - 0.62 \dot{F}$	0.025 - 0.05	-0.200	0.067	-0.067
		$-0.23 - 0.56\ddot{F}$	0.025 - 0.05			
		$-0.20 - 0.44 \dot{F} - 0.38 \dot{F}$	0.025 - 0.05			
Displacement	11	$0.57 - 0.42 \dot{F}$	0.10 - 0.25	0.455	0.273	0.091
•		$0.50 - 0.50\dot{F}$	0.05 - 0.10			
		$0.56 - 0.25 \dot{F} - 0.39 \ddot{F}$	0.10 - 0.25			

^{1,} Re-election of incumbent party $\dot{F}(\ddot{F}) = -1, \dot{F}(\ddot{F}) < -2$ percent (percentage points) -1, Defeat of incumbent party $0, -2 \le \dot{F}(\dot{F}) \le 2$ percent (percentage points)

^{1,} F(F) > 2 percent (percentage points)

eral form of the E functions is similar, i.e., the incumbents lose support when and F increase, during war or depression as well as at other times. The constant term, however, is negative in normal periods but positive during the displacement period. This implies that during war or economic crisis the incumbents have a larger support base than during normal times.

Observation 2: Newly-Elected and Reelected Parties

When a party newly assumes the presidency, a period of adjustment is required. First-term parties often lack momentum to carry out rapid change in fiscal policy. By virtue of having supporters in office already, reelected parties are in a better position to hasten fiscal change (the change not necessarily being in direction. but also in rate of growth).

Tables 3 and 4 compare election result and subsequent F and F, respectively. Although the sample sizes are small, Chisquare analysis indicate 98 percent significance of non-randomness. Re-elected parties (E = +1) are more likely to accomplish fiscal change than are newlyelected governments.

Table 3 also shows the tendency of new governments (E = -1) to decelerate expenditures, (slowing the rightward move in F) and of returned governments to accelerate expenditures (capitalizing on support to move F to the right in Figure 1). Following 10 of the 14 reelections (71 percent) F accelerated. In contrast, it accelerated only 2 of 11 times (18 percent) following defeats.

Table 3 E at t and F at t + 1, 1884-1980.

 F at t + 1		Election Result at t		
		Defeat	Re- election	N
$\ddot{F} < -2$		7	4	11
$-2 \leqslant \ddot{F} \leqslant 2$		2		2
$\ddot{F} > 2$		2	10	12
_	N	11	14	25

Source: Appendix

Table 4 E at t and F at t + 1, 1880-1980.

	Election Result at t			
Fatt + 1		Defeat	Re- election	N
F < − 2		2	7	9
$-2 \leqslant \dot{F} \leqslant 2$		4		4
$\dot{F} > 2$		5	8	13
	N	11	15	26

Source: Appendix

There is a less clear relationship between E and F the subsequent electoral term. (See Table 4). It may be that the margin of victory is a significant factor, i.e., the higher the vote percentage of the victor, the greater will be that administration's capacity to expand expenditures. The 1956-1980 period supports such expectation concerning the response of F to election results (Table 5). F increased after each of these reelections. That F is more responsive during this period may be due to the very large re-election victories that characterize it. A president reelected by margins as large as those of Eisenhower. Johnson, and Nixon has less incentive to resist the growth in expenditures.

This difference in sensitivity to election results between F and F is understandable. It is easier to slow down a speeding car than to throw it in reverse, or to increase its velocity when in motion than to get it moving when it is at rest. Similarly, it is easier in the short-run for presidents to change the rate at which F is rising or falling than to shift its direction.

Observation 3: Republicans and Democrats

Table 1 reveals fiscal differences between the parties (see Tufte, 1978). Of the administrations that decreased F, almost 90 percent are Republican. Republicans also comprise 80 percent of the administrations that simultaneously decreased and decelerated. Of the 15 Republican administrations, 10 (67 percent) either decreased, decelerated, or both. In constrast, only 5 of the 11 Democratic administrations (45 percent) behaved this way.

Table 5 Presidential Election or Re-election at t and F at t + 1, 1956-1980. (* indicates re-election; R = Republican, D = Democrat).

President	Election Year t	% Vote	F at t+1
D. Eisenhower (R)	1956*	57%	7.6
J. Kennedy/L. Johnson (D)	1960	50	1.1
L. Johnson (D)	1964*	61	11.8
R. Nixon (R)	1968	43	0
R. Nixon/G. Ford (R)	1972*	61	8.0
J. Carter (D)	1976	48	1.3

Source: Appendix

Observation 4: Fiscal Differences Between Hoover and FDR

There exists a widely held belief about the fiscal "conservatism" of Herbert Hoover and the fiscal "liberalism" of Franklin D. Roosevelt. The fiscal data do not support these beliefs. Under Hoover, F increased by 197 percent, an acceleration of 201 points. These are the biggest in-F and F during non-war creases in periods, and second only to the increases during World War II. Although Hoover to combat the depression had increased government expenditures, the enormous increase in F is more attributable to the enormous decrease in GNP. Nonetheless. Hoover's defeat in 1932 conforms to the hypothesis. (It is interesting to note that in 1928, the Republicans under Hoover were reelected with 58 percent of the vote, the highest margin of victory for an incumbent up to that time. Such a large reelection may have contributed to Hoover's decision to increase F as much as he did when the Great Depression hit.)

In contrast, during the first Roosevelt administration, F increased by 20 percent, still a large increase by historical standards. But this increase represented the largest deceleration during peacetime. During FDR's second term, F was only 5 percent, one of the smallest increases in the data, for a deceleration of -15, a substantial magnitude during a non-war period. Thus, one can metaphorically say that what FDR did was to put the brakes on a run-away F.

Nevertheless, slowing down the growth

of F is not the same as cutting it back. Before the Great Depression, F was down to about 3 percent, roughly the same as in 1900. (World War I appears to have had minimal lasting effect on F.) By 1936, F was 11 percent and has never been that small again. It appears that FDR's political achievement lies not in expanding the fiscal role of the government, as many suppose, but in bridging the gap between where the electorate was in 1928 and where the government was in 1936. By repackaging and relabeling federal expenditures, he "sold" a bigger budget to the electorate, raising enough support to stabilize F at a much higher equilibrium than had been possible before. What he did, then, was to shift the S curve to the right in Figure 1. This in itself is a remarkable achievement. Our interpretation does not detract from what Roosevelt did. It simply fits the fiscal facts better than the popular belief.

Observation 5: Why F Has Not Decreased Since 1956

As Figure 2 shows, F has experienced no declines since 1956. It has increased after all three reelections regardless of party. Following the defeat of the incumbents, F remained roughly constant but it did not fall. Why? We believe this is because none of the defeats gave the opposition more than 50 percent of the vote. Kennedy (1960), Nixon (1968), and Carter (1976) were elected with 50 percent, 43 percent and 50 percent of the vote, respectively. (In 1968, Wallace's third party campaign took so many votes away from the major parties that they ended up almost evenly splitting only about 85 percent of the vote). Thus, there have been no large-scale victories for an "out" party since 1952, when Eisenhower defeated Stevenson with 57 percent of the vote (See the Appendix). We do not expect a sharp contraction in F until such an event is repeated.

Observation 6: Periodicity

The cycles apparent in Figures 3 and 4 indicate periodicity, the tendency of systems to vacillate regularly about a mean path. Since large perturbations tend to dampen, the data suggest that the fiscalelectoral system of the federal government is homeostatic, or self-correcting. The general tendency over the last half century has been for expenditures to increase relative to GNP. However, a process-response system is at work which maintains the rate of increase constant. An acceleration is followed by defeat, which is followed by a deceleration, which is followed by a reelection, which is followed by an acceleration, and the cycle is repeated. Thus elections regulate the rate of growth of expenditures in a way suggested by the theory of an "open" system (von Bertalanffy, 1956).

We speculate that the fiscal-electoral model has a strong feedback mechanism. Fiscal policy influences subsequent election outcome and election results in turn influence subsequent spending.

Conclusion

The history of presidential elections in the United States shows a strong relation between increases and accelerations in F and the defeat of incumbents. Whereas a fiscal-electoral linkage may be only a small portion of a comprehensive political model, we submit that this linkage is significant, quantifiable, and conceptually justified.

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Appendix F, F, F, E and V, 1880-1980 (* Indicates outcome predicted by our model; R = Republican, D = Democrat)

Year	F_	Ė	ř	v	E	Winner	Outcome
1876	3.4						_
1880	2.5	- 26		48	+ 1	R	*
1884	2.3	-08	+ 18	48	1	D	
1888	2.5	+ 09	+ 17	49	– 1	R	*
1892	2.7	+ 08	-01	43	- 1	D	*
1896	2.9	+ 07	-01	47	- 1	R	•
1900	2.9	0	-06	52	+ 1	R	*
1904	2.7	07	-07	56	+ 1	R	*
1908	2.6	-04	+ 03	52	+ 1	R	*
1912	2.0	-23	- 19	12	-1	D	
1916	2.8	+ 40	+63	49	+1	D	
1920	6.7	+ 139	+ 99	34	– 1	R	*
1924	3.5	-48	- 187	54	+ 1	R	*
1928	3.0	-11	+ 37	58	+ 1	R	*
1932	9.2	+ 197	+ 208	40	- 1	D	*
1936	11.0	+ 20	- 177	61	+1	D	•
1940	11.6	+ 05	- 15	55	+ 1	D	*
1944	44.3	+ 281	+ 276	53	+ 1	D	
1948	14.9	66	-347	50	+1	D	*
1952	20.7	+ 39	+ 105	44	-1	R	•
1956	17.1	- 17	- 56	57	+1	R	*
1960	18.4	+08	+ 25	50	- 1	· D	*
1964	18.6	+01	- 07	61	+ 1	D	*
1968	20.8	+12	+11	43	-1	R	•
1972	20.9	0	-12	61	+1	R	•
1976	22.6	+ 08	+ 08	48	-1	D	•
1980	22.9	+01	- 07	41	– 1	R	

Sources: M. Slade Kendrick, A Century and a Half of Federal Expenditures (New York: National Bureau of Economic Research, Inc, 1955); Joint Economic Committee, Economic Indicators (Washington, D.C.: 1980 and 1981); Congressional Quarterly's Guide to U.S. Elections (Washington, D.C., 1975); and Richard M. Scammon and Alice V. McGillivary (ed.) America Votes, 14 (Washington, D.C.: Elections Research Center, 1981).