Arms Control and Strategic Arms Voting in the U.S. Senate

PATTERNS OF CHANGE, 1967-1983

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This article examines the basis of U.S. Senate support for defense spending and arms control from 1967 to 1983. Some of the findings include the following: Those senators still in office at the end of the 1970s voted the same way on SALT II as they had on ABM limitation in the late 1960s, so no long-term change occurred in the senators' positions on these arms control issues. In contrast, the considerable freedom that senators have to stake out a position of their choice on the hawk/dove continuum can be seen in the weak coefficients of determination between a senator's position and those of his or her predecessors and contemporary fellow senator from the same state. As for the military-industrial complex, traces of its influence are, during the 1970s, at best weakly associated with a senator's hawkishness or dovishness. There are indications of a modest effect of defense-related PACs on roll-call voting in the early 1980s. Although this is cause for concern about the future, other evidence in the article undermines belief in the military-industrial complex model.

Defense policy, military spending, and arms control raise complex questions that must be simplified down to "yea" and "nay" answers in the public roll-call votes in the U.S. Senate. An understanding of the basis of senators' voting decisions can be of value to those who study international security affairs and the arms race. The major studies

of the subject (Russett, 1970; Bernstein and Anthony, 1974), however, are early, dating from the Vietnam war era. The present article updates these analyses to consider whether the findings continue to hold in more recent times, to explore the potential impact of new developments such as corporate poliltical action committees (PACs), and to examine the evolution of senators' positions from the late 1960s to the early 1980s.

Decisions on defense are an intellectual challenge even to specialists in international security, who achieve a modicum of mastery in the subject but often hotly debate what the United States government should do. Non-specialists, in Congress and the public, have been puzzled by the complexities of these defense policy debates. Members of Congress, who need to take a position on such matters (Mayhew, 1974: 61-73), have several options:[1]

(1) vote on the basis of the constituency's opinion (e.g., vote hawkish in cases where one's constituents are hawkish);[2]
(2) vote on the basis of the economic interests of the constituency (e.g., vote hawkish if there are particular defense installations in the state or district);
(3) vote on the basis of campaign contributions (e.g., vote hawkish if one's campaigns are supported by defense industry political action committees (PACs));
(4) vote on each proposal separately considered on its particular merits (e.g., vote hawkish if a particular weapons system seems tailored to meet one's goals); or
(5) vote on the basis of general ideological inclination (e.g., vote hawkish on all roll calls to the degree that one is "conservative").

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1. Although the present study focuses on the Senate, some of the propositions will be relevant to both Houses. "Members of Congress" will refer to senators and members of the House of Representatives.

2. It should be noted at this point that the "geographic" constituency (Fenno, 1977) is what laypersons normally think of as the constituency—that is, it is the state or district the member was elected to represent. When not qualified, the term "constituency" in this article refers to this basic, geographic constituency, given that the minimum winning coalitions and other subconstituencies discussed by Fenno (1977) and Kingdon (1973) are not directly related to the measures of constituency economic base used here.

Prior research (e.g., Miller and Stokes, 1963; Russett, 1970; Bernstein and Anthony, 1974) has tended to show that—at least in the 1950s, 1960s, and early 1970s—the ideological factor has tended to dominate the others, although the jury has remained out on the role of PACs, which has not received sufficient systematic attention. Members of Congress have tended to simplify the debates on the arms race into an ideological clash between hawks, who support a strong defense and emphasize conflicts of interest with the Soviet Union, and doves, who emphasize reduced spending, support for arms control, and a search for détente with the Soviet Union. Indeed, past research indicates that congressional responses to the arms control issue are part of a one-dimensional "general defense orientation" to foreign and defense policy, and that members' attitudes on defense and arms control are largely shaped by their basic ideological stance. The one notable, documented exception involves arms sales abroad, which does not load on the general defense dimension (Russett, 1970: 37). A controversial question is whether voting is becoming even more ideological in Congress, as argued by Schneider (1979). Certainly ideological voting has been and continues to be powerful; Mitchell (1979: 591-592) argues that its power is understandable, given that it greatly reduces information costs while being meaningful to the voting public. In this article I will examine congressional coalitions on defense in the past decade and will argue that the coalitions remain basically ideological. I will reach that conclusion primarily by testing three competing hypotheses with multiple regression analysis:

(1) Ideological position, as indicated by the Americans for Democratic Action (ADA) rating of senators' liberalism, accounts for voting on defense issues.[3]
(2) Economic interests of the constituency, as measured by the jobs and money provided by Department of Defense (DoD) activity, account for voting on defense issues.
(3) Campaign contributions from corporate PACs, as measured by contributions to the incumbent senator and contributions to challengers running against him or her, account for voting on defense issues.

The multiple regression analysis, conducted on data from the 1970s, indicates (a) that the general voting tendency or ideology of the member

3. ADA scores are measures of the roll-call voting support for liberal causes, based on key votes selected by the ADA (Poole, 1981; Schneider, 1979: 55-56).

shapes his or her voting on defense; (b) that this effect of ideology, initially sizable in stepwise regression, is virtually undiminished by controls for economic interests of the constituency and PAC contributions; and (c) that PACs and constituency economic interests are insignificant (controlling for the effects of ideology). The basic finding, in short, is that the effect of general ideology is not significantly altered by the measured forces of the military-industrial complex, as expressed in the second and third hypotheses. This basic finding for the 1970s era is generally reinforced by a series of other tests (e.g., regression of the changes in senators' defense voting patterns over time as a function of new PAC contributions they have received in the interim). Certain ancillary tests for the early 1980s do require one modification of the multiple regression findings—namely, that the role of PACs changes through time, with signs that the defense PACs had become large enough by the 1980s to affect some Senate voting patterns moderately. Hence this article raises serious doubts about the importance of the military-industrial complex in Senate voting in the 1970s, although the role of the military-industrial complex needs to be continually reevaluated, especially if defense PAC spending continues to grow in real dollars.

My analysis proceeds in two stages. First, the voting in committee on the SALT II treaty is briefly scrutinized in order to show how long-term processes have affected the hawkish and dovish coalitions in the Senate. Second, voting in the Senate as a whole on a variety of defense and arms control issues is examined in order to test a series of hypotheses about the military-industrial complex.

SENATE SUPPORT FOR SALT II

The 1970s were ushered out by the grisly specter of a resurrected cold war. The Soviet invasion of Afghanistan triggered an increase in real U.S. defense spending and called into question both the SALT II arms control treaty and an entire era of détente and arms control efforts. In turn, resistance to SALT by some U.S. Senators in 1979 may have made the Soviets skeptical of the payoff from détente and thus contributed to the decision to invade Afghanistan. A vicious cycle of rearmanent thus accelerated, and, as usual, it was difficult to pinpoint when it started or which side started it. It does seem clear that one important step in the cooling of Soviet-American relations was

the reception accorded the SALT II treaty in the Senate Foreign Relations and Armed Services Committees. Although the Foreign Relations Committee voted by a 9-6 margin in favor of ratification, this was not proportional to the two-thirds majority that would be needed for ratification by the Senate as a whole. Then, at the end of the 1979 session, ten members of the Armed Services Committee resolved that approving SALT II "is not in the national security interests of the United States." On that vote, the seven pro-SALT members of the committee indicated support of SALT by the tactic of abstaining rather than voting against the resolution; they voted "present" as an assertion that only the more dovish Foreign Relations Committee had jurisdiction over SALT. In effect, the strategic arms elite of the Senate had split down the middle on SALT II, with sixteen members of the two committees advocating rejection of the treaty as it had been negotiated, and sixteen (including those voting "present") supporting the treaty and the president's position.

The journalistic approach to the causes of Senate voting was to focus on the events, such as Senator Church's reelection campaign or the discovery of a Soviet brigade in Cuba, that produced day-to-day fluctuations in support for the treaty. Although these short-term forces did have a crucial impact on the percentage of senators supporting the treaty, too little attention was paid to the underlying, long-term forces that can account for the voting coalitions that emerged. Such a focus on the long term can help us understand the *causes* of change in the underlying hawk/dove ratio in the Senate. Indeed, as we shall see, the labels "hawk" and "dove," first used in the Vietnam war era, remain appropriate because the coalitions that were clashing over SALT II were the same groups that had been in conflict over defense policy at the end of the Vietnam era.

The durability of long-term forces can be seen from the fact that the 1979 SALT votes can be almost perfectly predicted on the basis of the 1970 ABM votes of the same senators (as analyzed in Bernstein and Anthony, 1974). Fourteen senators served throughout the decade and became members of the two committees that voted on SALT II. Eight of these men supported the anti-ballistic missile system. Of these eight hawks, seven voted against SALT II; only one hawk switched to a dovish position and "supported" the president's SALT II treaty. The five who opposed ABM remained dovish in 1979 and supported SALT II ratification. So did Percy (Rep., Ill.), who had waffled on the ABM issue. (These patterns are summarized in Table 1.) Of those

TABLE 1
Consistency of Voting over a Ten-Year Period[a]

	VOTES IN 1970 IN ABM		
	Two Votes Against ABM (Dove)	One Vote for, One Vote Against ABM	Two Votes for ABM (Hawk)
VOTE IN 1979 ON SALT II — For Salt II (Dove)	Constant Doves Church, D-Id. Pell, R-R.I. McGovern, D-S.D. Muskie, D-Me Javits, R-N.Y. N = 5	Two Who Became More Dovish Percy, R-Ill. N = 1	Stennis, D-Miss. N = 1
Against SALT II (Hawk)	Those Who Became More Hawkish N = 0	N = 0	Constant Hawks Baker, R-Tenn. Jackson, D-Wash. Cannon, D-Nev. Byrd, Ind-Va. Tower, R-Tex. Thurmond, R-S.C. Goldwater, R-Ariz. N = 7

a. Members of the Foreign Relations Committee underlined; members of the Armed Services Committee not underlined. Yule's Q = 1.0 for any 2 x 2 version of this table (i.e., with the ABM voting converted to a dichotomous variable). For the 3 x 2 version above, Pearson's r = .84.

who had taken a clear stand on ABM, all but one—Stennis (Dem., Miss.)—voted the same way on SALT II as they had on ABM.[4]

So the Senate elder statesmen showed great constancy on strategic arms. Doubtful voters like Church (Dem., Idaho) and Baker (Rep., Tenn.), who dramatized their indecision for months, finally decided to repeat their past rather than switching to a new position. Party identification did not interfere with this constancy. As can be seen in Table 1, the hawk/dove alignment was basically nonpartisan. With the exception of Senator Baker, all the elder statesmen of the Foreign Relations Committee were doves—both Republicans and Democrats. And the senior members of Armed Services, with the exception of Stennis, took a hawkish position, whether they were Democrats or Republicans. For a decade, despite the pull of partisanship, these ideological patterns of hawk and dove persisted.

This finding of constancy gives us some evidence about the military-industrial complex theory. One possible pattern by which such a complex could operate would be for senators from arms-manufacturing states to vote for heavy armaments. A thorough study by Bernstein and Anthony (1974), however, showed that this was not happening on the ABM issue in 1970. Instead, senators were shown to be voting for or against ABM for ideological reasons, as measured by their ADA scores. We see in Table 1 that the senators, with the exception of Stennis, voted the same way on SALT II in 1979 as they had on ABM in 1970; indeed, the 1970 patterns are based on exactly the same votes as in Bernstein and Anthony's study. So the Bernstein and Anthony voting blocs, based on ideology and not on state military-industrial complexes, operated intact for a decade and still accounted for the votes of the Senate elder statesmen.

The constancy of the elder statesmen may not be surprising. Organizations tend to change more because of new members with fresh ideas than because of the conversion of old members.[5] What, then, can we say about the new members of these two committees—the ones elected after 1970, after the cold war was abating and détente was developing? Surprisingly, the new members were no different than the

4. All these votes and senators form a perfect Guttman scale. That means that no senator is more dovish than his or her colleagues on one vote but more hawkish on another vote. This indicates that the 1979 votes were part of the same dimension as the 1970 votes, despite the passage of a decade.

5. This pattern has been shown to hold for the Senate in its approach to foreign policy (Burstein and Freudenberg, 1977).

TABLE 2
Committee Assignment by Voting Tendency, for Senators First
Elected During the 1970s

	VOTE ON SALT II	
	Dovish	*Hawkish*
Foreign Relations Committe	Biden (D-Del.) Sarbanes (D-Md.) Zorinsky (D-Neb.)	Glenn (D-Ohio) Stone (D-Fla.) Helms (R-N. C.) Hayakawa (R-Calif.) Lugar (R-Ind.)
	33%	56%
Armed Services Committee	Nunn (D-Ga.) Culver (D-Iowa) Hart (D-Colo.) Morgan (D-N. C.) Exon (D-Neb.) Levin (D-Mich.)	Warner (R-Va.) Humphrey (R-N. H.) Cohen (R-Maine) Jepsen (R-Iowa)
	67%	44%

more senior members, even though the latter had Senate careers going back to the cold war era and Vietnam. The elder statesmen split down the middle on SALT, 7-7, and the new members also split evenly, 9-9. But within each committee, the arrival of new members was affecting the power balance between hawks and doves. As Table 2 shows, the formerly dovish Foreign Relations Committee attracted a hawkish junior echelon, whereas the formerly hawkish Armed Services Committee had a junior membership of a predominantly dovish persuasion.

One plausible reason for these trends is that conservative Southern states like Florida (Senator Stone) were gaining seats on the Foreign Relations Committee whereas liberal northern states like Michigan (Senator Levin) were gaining seats on the Armed Services Committee. Such an explanation, based as it is on the assumption that a certain type of state elects hawks and another type elects doves, is not always supported by the evidence. If the geographic constituency were really important, one would expect senators to vote in a manner consistent with their predecessors from the same state. Instead, the opposite was happening: Senators who were hawkish in 1979 tended to come from states that had had dovish representation in 1970, and vice versa. Not too much should be made of this negative association. It is based on

a small number of cases (18), and we shall see that there is a slightly positive correlation when we consider the Senate as a whole and a larger number of votes later in the article. Still, it is worth considering briefly how a weak positive, or even a negative, correlation could occur when some observers might have expected a stronger positive association. Fenno (1977: 884-889) distinguished between the geographic constituency, emphasized in the Miller-Stokes study (1963), and the reelection, primary, and personal constituencies of the congressman (see also Kingdon, 1973: 34, 268). We have seen that the geographic constituency exerts so little constraint on a senator's defense policy voting that senators often take the opposite stand from their predecessors. In the Fenno framework, we can see that this is perhaps in part because of the ability of senators to build selectively and creatively their own reelection, primary, and personal constituencies that are different from those of their predecessors and their fellow senator from the same state. Indeed, it may be that a senator running for reelection can most successfully be challenged by an opponent with opposing convictions, who can appeal to different subconstituencies within the same geographic constituency. Not so surprisingly, then, it seems that the findings from earlier studies still hold (Miller and Stokes, 1963), and a senator's hawkishness or dovishness depends more on his general ideological stance than on the constraints imposed by his or her geographical constituency; in fact, most states seem heterogeneous enough to provide an electoral base for either a hawk or a dove.

SENATE COALITIONS ON
DEFENSE AND ARMS CONTROL, 1967-1983

Although examining the SALT II vote in key committees provides some insight into the congressional politics of defense policy, it is also useful to examine a broader battery of issues and to examine voting patterns in the Senate as a whole. In this section evidence will be presented in support of three theses about the Senate as a whole:

(1) Being a hawk, moderate, or dove is not significantly associated with the size of the military sector in a senator's home state.
(2) Defense PACs are probably not spending enough to defeat doves even if the PAC spending patterns were efficient. Perhaps because of this, the new PACs were no more of an influence on voting than the economic interests of the con-

stituency, in the 1970s, but the PACs appear to have gained some modest in-
fluence in the 1980s as their spending has increased from the minimal to the
moderate level.
(3) Ideology remains the dominant predictor of voting patterns, as found by Russett
and Bernstein and Anthony a decade ago.

In general, then, the evidence below will reinforce the point already
made in the study of key committees: Senate candidates have a great
deal of flexibility in the initial decision to be a hawk, dove, or
moderate; senators apparently can and do take a *general* stand with
little regard to defense PACs and with even less to defense interests
in the state.

The major studies of congressional roll-call voting on defense were
done in the late 1960s, during the Vietnam-era questioning of American
militarism. As ideology best accounted for voting patterns, evidence
from the past is not particularly supportive of the military-industrial
complex model. There are, however, some compelling reasons for a
closer look. Russett (1970: x) wanted to conduct a study that had a
longer time frame, but he was (correctly) convinced that the national
debate over Vietnam made prompt publication of a thorough but brief
study imperative. No one has subsequently pursued his suggestion that
it would be appropriate to take a longer-term view. And the subsequent
rise of political action committees among the defense industry firms
adds a new dimension to the problem, justifying a fresh look at the
evidence. Furthermore, Arnold (1979) found that key members of con-
gress are especially effective in protecting their districts from such
negative actions as base closings. It may be that patterns found by
Russett in a period of relative expansion of the military (his indices
cover 1961-1962 and 1967-1968) are changed in a period of retrench-
ment. By examining voting in 1977, toward the end of post-Vietnam
isolationism, we may detect greater dedication to protecting potentially
threatened military-industrial assets in senators' home states. Finally,
the unusually large defense build-up of the Reagan administration has
renewed the cyclical interest in this old subject.

To examine the potential influence of home state economic interests,
of PACs, and of ideology on Senate voting, it was necessary to con-
struct an index of support/opposition to defense spending. The Senate
roll-call votes for 1977 were first screened to eliminate domestic policy
issues. Remaining were 73 votes relating to foreign and/or defense
policy, and these were further winnowed to eliminate those (chiefly

foreign aid budgets and restrictions on human rights violators) that were not strongly related to some clear defense-corporate interest. In addition, votes of legislative procedure and lopsided votes (decided by a six-to-one or greater margin) were deleted. The remaining 15 votes were analyzed for unidimensionality using the Yule's Q correlation coefficient. The 11 votes that were highly correlated with each other (with Yule's Q > .65 for every pair of votes) were used to construct an index of dovishness. Senators were each assigned a score from 0 to 11 for the number of dovish votes cast. The 11 votes in the index are shown in Table 3.[6]

The scores on this hawk/dove index were compared to four measures of the economic interests of the senators' home states. The four measures of home-state economic interests were as follows:

(1) Department of Defense expenditures per capita, 1977 (Barone et al., 1979);
(2) net gain or loss (in millions of dollars per capita) from DoD expenditures and DoD tax burden (J. Anderson, 1982);
(3) gross jobs resulting from DoD activity (M. Anderson, 1982); and
(4) net job again or loss due to military spending (M. Anderson, 1982).

The last two measures, focusing on jobs, are included because of Russett's finding that "the only defense spending measure that shows a strong relationship with [the general defense scale] is military payroll" (Russett, 1970). This finding suggests that senators may be especially sensitive to employment in their state, even when they are insensitive to other aspects of state economic interests. The other two measures used in this article are general measures of the impact of the DoD on the state economy. The net gain or loss, taking into account the tax burden as well as the returning expenditures, is the broadest measure and would tend to be associated with hawkishness/dovishness if the senators react to the overall effect of the DoD on their state. The gross DoD expenditures, on the other hand, because they do not include taxation, focus more narrowly on what the DoD bureaucracy has done for the state.

6. Because of the high correlations among individual items, a senator's overall scale score is not especially dependent on which of these 11 items are included or excluded. For example, were any reader concerned by the emphasis in the index on Warnke and the neutron bomb, it should be reassuring that the correlation between the 11-item index and a 5-item scale (#252, 281, 307, 524, and 525), which de-emphasizes Warnke and the neutron bomb, is $r = .92$.

TABLE 3
Roll-Call Votes for Defense Voting Index, 1977

ICPSR No.	Yeas	Nays	Subject
51	58	40	a vote to consent to the nomination of Paul Warnke to be chief SALT negotiator
52	70	29	a vote to nominate Paul Warnke as chief SALT negotiator
281	43	42	a vote to require that an arms control statement, and a presidential statement of need, be submitted to Congress before the neutron bomb could be produced
283	41	44	a vote to table the Nunn Amendment to the Hatfield amendment; Nunn allows Congress to bar production of the neutron bomb by concurrent resolution passed within 60 days of a proposal of weapons production
290	38	58	a vote to amend HR 7553 (an appropriations bill for Public Works and ERDA) by unconditionally prohibiting production of the neutron bomb
291	48	47	a vote to rule on the germaneness of the Kennedy amendment to HR 7553, an amendment that would prohibit production of the neutron bomb until it was approved by the president, it then being subject to veto by a simple resolution of either house
292	51	44	a vote to table the Kennedy amendment
293	74	19	a vote to amend HR 7553 by barring production of the neutron bomb until the president declares it to be in the national need; Congress could then veto it by concurrent resolution within 45 days
307	59	36	a vote to amend HR 7933, a Department of Defense appropriations bill, by reducing the appropriation for the B-1 bomber because of the president's decision not to produce it
524	19	77	a vote to table S. Congressional Resolution 47, a resolution declaring support for President Carter's decision to uphold arms limits established in the 1972 SALT talks
525	62	34	a vote to table the McClure amendment to S. Congressional Resolution 47 by stating that the resolution shall not prohibit or hinder the development of any nuclear weapon authorized by Congress

Compared to ideology and party, none of these economic measures correlates strongly with the defense voting scale:

	ADA Rating	*Party*	*Net Jobs*	*DoD$-Tax*	*Gross Jobs*	*DoD$*
Correlation	.89	-.52	-.26	-.23	-.12	-.10
Signif.	.00	.00	.01	.02	n.s.	n.s.

All relationships are in the predicted direction. The job measures (net and gross) work slightly better than the corresponding expenditure/tax measures. The net measures, which some critics might have assumed to be too subtle for politicians to notice, prove to be more significant than the gross measures, which such critics might have expected to be more politically salient.

Turning to multiple regression analyses of these variables, one finds that ideology (ADA rating) has a significant impact on the voting, whereas other variables do not. The effect of the economic variables is weak and not statistically significant (indeed, sometimes even in the wrong direction; see Table 4). The ADA score accounts for 79% of the variance in defense voting, and that percentage is not increased by adding variables. Nor do the additional variables decrease to any significant degree the beta for ADA rating. Use of alternative measures, such as gross rather than net jobs and taxes, and per capita rather than absolute amounts, does not alter the results in any noticeable way. In short, the bivariate and multivariate evidence indicates that economic factors, as measured in this article, have at best a weak influence on the roll-call voting on general defense issues.

In accounting for this finding, we must begin with the realization that the economic impact of defense on the states is high, especially in the case of certain states. For example, the 1977 DoD expenditures in Connecticut were over $700 per person (in 1977 dollars; see Barone et al., 1979: 149). The net effect of the DoD expenditures and taxation on Illinois in 1980 was a deficit of almost $600 for every person in the state, whereas Connecticut enjoyed a net advantage of about the same amount (J. Anderson, 1982: 6-7). In jobs, the net estimated loss to Michigan was 139,000 jobs in 1977—about 1.6% of the state population; meanwhile, South Carolina was estimated to gain 29,000 jobs— about 1.1% of the state population (M. Anderson, 1982: 3). Why do these large sums have no effect, or at best little effect, on Senate roll-call voting? There is little chance that voters in Senate elections will

TABLE 4
Regressing Defense Voting (1977) on Ideology, Party
Identification, and Defense-Related Net Taxes and Jobs

Independent Variables Included	N	Beta	T-Stat.	Signif.	R^2
ADA'77	97	.89	18.8	.00	.79
ADA'77		.86	15.2	.001	
Party ident.		−.06	−1.0	.31	
	96				.79
ADA'77		.85	14.1	.001	
Party ident.		−.06	−1.0	.31	
Net tax		−.05	−.6	.54	
Net jobs		.01*	.1	.89	
	96				.79

*Coefficient not in the predicted direction.

penalize the senator for voting contrary to the state's economic in-
terests, except for the few voters whose livelihood is directly affected
and who closely follow politics. Most voters do not know how their
senator voted. Most do not know the economic impact of his or her
voting. Most of a senator's votes on defense will not directly affect
the specific industries in his or her state anyway (see Bernstein and
Anthony, 1974, for an analysis of a vote that did). Even if a roll-call
vote did affect the state and the voters knew it, they may not vote
for or against the senator on that basis. So there are many reasons
why the senator is free to vote according to his or her own ideology
much of the time, and then to defend that record as in the best in-
terest of the nation as the senator sees it.

The powerful influence of ideology does not mean that the arms
control and strategic arms voting is something senators do with com-
plete freedom. Both ideology and defense voting are affected by a com-
bination of the members' individual preferences and their state's
political cultures. One indication of the constraint imposed on them
by their state political cultures is their agreement with the other senator
from that state. On the defense indices we have been using, the cor-
relation between the ratings of the two senators from the same state
was r = .53 (r^2 = .27) in 1967-68 and r = .58 (r^2 = .33) in 1977.

In other words, from one-quarter to one-third of a member's defense voting can be accounted for by the defense voting of the senator who represents the same geographic constituency. Although this is an impressive degree of restraint, one must also note that there is considerable freedom for maneuver (the "unexplained" variance being .67 to .73).

And when one examines the constraint from the point of view of the state's political tradition, as indicated by the hawkishness/dovishness of a senator's predecessors, the freedom of action seems even greater. Recall that in the analysis of the Armed Services and Foreign Relations committees, discussed earlier, there was even a slightly *negative* relationship between a senator's hawkishness and that of his or her predecessors. A similar analysis was done for the Senate as a whole, attempting to predict senators' positions on the 1977 defense index from their predecessors' scores on the Russett general defense index of 1967-1968. The astonishing committee pattern, in which hawks seemed to breed doves and vice versa, is by no means repeated for the whole Senate. In states with two hawks in 1967-1968, 71% of the subsequently elected senators were hawks themselves and only 29% were doves; in states with two doves in 1967-1968, 73% of the subsequently elected senators were doves and only 27% were hawks. Although this does indicate an important degree of crude constraint from the state's political culture, those who would overemphasize that constraint should be chastened when they realize that the Pearson product-moment correlation between the 1967-1968 state delegation score (sum of the Russett general defense score for both senators) and the 11-item 1977 defense index score for that state's subsequent senator is only $r = .17$ ($r^2 = .03$). (In contrast, for those senators who stayed in office throughout the period, the correlation between their 1967-1968 and 1977 scores is a much larger $r = .82$.)

In short, it would seem that senators are even less constrained by the state's historic tradition, as measured by their predecessors' votes, than they are by the contemporary state political culture, as measured by their fellow senators' votes. It is unclear how much of this freedom is due to the existence of different electoral constituencies (e.g., Democratic and Republican) in the same state and how much to a senator's ability to act as a Burkean representative on defense issues. But for whichever reason, it is clear that state electorates are able to support a wide range of defense voting in their senators, and, thus somewhat free of restraint, senators can afford to vote ideologically.

Another question arises: Is senatorial freedom to maneuver significantly constrained by the campaign contributions of corporations in the defense industry? Such corporate political action committees have become an important political innovation since they were fostered by legislation in 1974. They have grown rapidly, both in number and in funds contributed. Corporate PACs have been especially prominent in industries that are heavily involved with government. Not surprisingly, therefore, corporations in the defense industry have organized PACs. Research on these PACs has not kept pace with their activities. The problem is that the corporate PACs are a moving target: they are not only growing in scale, but also learning new strategies as they go through their first decade of existence.

This study focuses first on the 1978 senatorial elections and the campaign contributions for the primary and general elections in 1977-1978. Omitting senators who had died or had decided to retire at the end of their terms, one is left with 23 senators who fought for reelection in 1978. Data on the PAC contributions of the largest defense contractors were obtained by identifying the largest prime defense contractors (Department of Defense, 1979) and requesting the tallies of their PAC contributions to Senate campaigns (from the files of the Federal Elections Commission). The PAC contributions of the 16 largest defense contractors were then examined. There were two reasons for cutting off the list at the top 16 companies: First, these companies held 42% of all prime defense contracts and hence represented a sizable proportion of all economic activity in the defense field; second, the companies further down the list included a large number of corporate giants (GM, AT&T, Exxon) that have large civilian and military contracts and customers.[7] The top 16 companies, as the biggest firms in the industry, may bear a disproportionately large burden of any of the lobbying by individual firms for the industry as a whole (as Olson, 1965, argues for collective political action in general).[8]

The 16 firms are General Dynamics, McDonnell Douglas, United Technologies, Lockheed, General Electric, Litton Industries, Boeing,

7. For a discussion of subcontracts, see Russett (1970: 59-63, 65-66, 80).

8. Although the largest firms have the greatest potential payoff and should be studied first, it is also true that the smaller companies should be examined more carefully in the future, especially as more corporations develop PACs. It is also true that some PACs below sixteenth place deserve attention. LTV, for example, although positioned in the low twenties in terms of prime contracts, had the largest corporate defense PAC and was fifth in size of all corporate PACs (Epstein, 1980: 119).

TABLE 5
Defense Score, 1977, and Defense PAC Contributions,
1977-1978, for Senators Running for Reelection in 1978

Senator	Roll Call Score	Net Defense PAC Contributions		Gross Defense PAC Contributions	
		Net Advantage to Incumbent	*Net Advantage to Challenger (s)*	*to Incumbent*	*to Challenger*
Thurmond (R-S.C.)	0	18,750		19,150	400
McClure (R-Idaho)	0	3,050		3,050	0
Domenici (R-N. Mex.)	0	5,650		6,150	500
Helms (R-N.C.)	0	7,150		7,150	0
Griffin (R-Mich.)	1	7,500		15,500	8,000
Tower (R-Tex)	1	15,125		17,725	2,600
Baker (R-Tenn.)	2	17,000		17,000	0
Stevens (R-Alaska)	3	9,150		9,150	0
McIntyre (D-N.H.)	5	9,500		10,000	500
Nunn (D-Ga.)	5	11,000		11,000	0
Johnston (D-La.)	6	7,100		7,100	0
Randolph (D-W. Va.)	8	2,850		5,650	2,800
Huddleston (D-Ky.)	8	4,200		4,650	450
Percy (R-Ill.)	10	3,250		4,250	1,000
Case (R-N.J.)	11		6,200	0	6,200
Hathaway (D-Me.)	11		1,200	2,000	3,200
Pell (D-R.I.)	11	2,500		2,500	0
Brooke (R-Mass.)	11	12,575		13,900	1,325
M. Hatfied (R-Ore.)	11	950		950	0
Biden (D-Del.)	11	2,600		3,200	600
Clark (D-Iowa)	11		2,550	900	3,450
Haskell (D-Colo.)	11		9,880	1,500	11,380
Anderson (D-Minn.)	11		6,400	2,600	9,000

NOTE: $y = -11,810.45 + 1,067.37X$; $r = .67$; $r^2 = .44$; $\bar{x} = 6.43$; $\bar{y} = .\$4,942.17$;
where x = number of dovish votes, y = contributions to challengers - contributions
to incumbent.

Hughes Aircraft, Raytheon, Grumman, Rockwell International, Chrysler, Honeywell, Northrop, Westinghouse Electric, and Fairchild Industries. PACs from these companies gave almost $200,000 to primary and general election challengers (see Table 5). After adjusting the contributions for state population differences (i.e., calculating per capita contributions), one finds that there is a − .16 Pearson correlation between dovishness and contributions to the incumbent; there is a .50 Pearson correlation between incumbent dovishness and contributions to challengers.

TABLE 6

Predicting Defense Voting from Ideology, Party Identification, Net Defense-Related Taxes and Jobs, and Net Campaign Contributions, for Senators up for Reelection in 1978

Independent Variables	N	Beta	T-Stat.	Signif.	R^2	$\bar{R}^2$
ADA '77		.88	7.6	.00		
Party ident.		−.14	−1.4	.17		
Net taxes		−.09	−.4	.69		
Net jobs		−.01	−.1	.96		
Net PAC contribs.		−.01*	−.1	.91		
	22				.92	.89

*Coefficient not in the predicted direction.

When contributions are included as independent variables in the regression analyses discussed above, they do not have a significant effect on the results. This means that if senators were anticipating the contribution patterns and adjusting their votes accordingly, the adjustments were not statistically significant (see Table 6).

The inefficacy of the PAC contributions can be understood better if one considers the small amounts of money involved (in comparison to what is needed to fund a Senate campaign) and the strategy by which the PACs spend their money.[9] Consider the strategy first. The large defense contractors give primarily to incumbents (see Table 5), but that tendency lessens as the incumbent senator's position becomes more dovish. An extreme hawk running for reelection (according to the regression analysis reported at the bottom of Table 5) could expect a net advantage over his or her challengers of $11,810 in contribu-

9. Because 1978 was part of a period of electoral setbacks for liberals, in the United States and almost everywhere else in the OECD area (The Economist, 1983), the liberal senators suffered disproportionate losses in these Senate races. Only two hawks (Griffin and McIntyre), as opposed to six doves (Anderson, Brooke, Case, Clark, Haskell, and Hathaway), lost in the primary or general election. Because net contributions from defense PACs went disproportionately to the hawks, there is a correlation between defense PAC contributions and campaign victory. One purpose, however, of the earlier analysis (last third of the article) is to show that such a correlation is not an indication of the PACs' effectiveness: The defense PAC giving was far too small to have affected the outcome of any of these particular campaigns. One explanation of the observed correlation may be that the PACs picked on anticipated losers.

tions from the 20 defense PACs representing the 16 largest prime con-
tractors. Dovish votes erode that advantage at a rate of $1,067 per
vote, until an extreme dove would have a net advantage of only $69.
The 1977 arms index is a reasonably good predictor of this net PAC
giving ($r^2 = .44$).

To see the strategic calculations, one must break down these net
figures into contributions to incumbents and contributions to
challengers. As for the PAC funds to the incumbent (with all calcula-
tions based on linear regressions), an extreme hawk can expect $12,578,
which erodes at the rate of $834 per dovish vote cast. As for PAC
funds to challengers, the challengers can expect only $784, which in-
creases at the paltry rate of $226 for every dovish vote cast by the
incumbent.

Jacobson (1980) has calculated what effect such contributions would
have on a Senate election campaign in 1974 (the off-year campaign
just prior to the 1978 election under study). Jacobson found that con-
tributions to incumbents have a much weaker effect on campaigns than
do contributions to challengers. This is because incumbents have ad-
vantages of incumbency and do not need much money to win votes,
whereas challengers are relatively unknown and need lots of money
to mount an effective campaign. Of course, the defense PAC giving
is thus distributed in a suboptimal way from the point of view of sway-
ing voters and electing hawks.

Assume, for example, the following conditions: The voting age
population in the state is 2 million; the challenger in the general elec-
tion is a Republican; the incumbent has made some mistakes that have
cost him 5% of the vote compared to the normal vote for an incum-
bent; and the incumbent is spending about $1.5 million and the
challenger about $1 million. According to Jacobson's formula, the race
would then be extremely close, with the challenger's share (almost ex-
actly 50%) given by the formula:

$$CV = 24.4 + b_1 \ln CEPV + b_2 \ln IEPV + b_3 P + b_4 \ln VAP + e$$
$$= 24.4 + 3.40 \ln 50 - .14 \ln 75 + 0 + 1.04 \ln 2000 + 5,$$

where CV = challengers's share
ln(CEPV) = natural log of challenger's expenditures in cents per voting-age person,
ln(IEPV) = natural log of incumbent's expenditures in cents per voting-age person,
P = party (1 for Democrats, 0 for Republicans),
VAP = voting age population in thousands, and
e = error.

In this hypothetical election, in which the challenger is just a whisker away from victory, what is the impact of defense PAC contributions? Will it matter whether the incumbent is an extreme hawk or an extreme dove? Recall that for each dovish roll-call vote, $834 less was given to the incumbent and $226 more to the challengers. Hence an extreme dove would have $9,170 less in his or her war chest and would face a set of challengers who had $2,481 more. With 2 million voters in the state, this comes to .46¢/voter less in the incumbent's coffers and .12¢/voter more in his or her challenger's coffers. Assume that half of this has already been spent in the primaries, thus reducing these figures to .23¢ and .06¢, respectively. The marginal impact of these funds on the hypothetical campaign will be as follows:

— The incumbent's expenditures per voter will drop from 75¢ to 74.77¢; the natural log of 74.77 is .003 different from the natural log of 75, so the shift this will cost in votes will equal $-.14 \times .003$, or .00043; if 1 million people vote in the election, this equals 4.3 votes.
— The challenger's expenditures will increase from 50¢ to 50.06¢; by the same calculations applied to the CEPV section of the previous equation, this will gain 41 votes for the challenger.
— The net effect of the 4 votes lost by the incumbent and the 41 votes gained by the challenger is a shift of 45 votes in the election.

This is the vote shift associated with the extreme case of contrasting an intense dove (holding 11 points on the 11-point defense scale) and an extreme hawk (holding 0 points).

A better strategy for PACs in swaying votes would be to withhold the money till the primary is over, and then throw all the money to the challenger. Doing that, in the previous hypothetical election, the defense PACs could increase the challenger's expenditures from 50¢ to 50.53¢, thus winning the challenger 359 votes. So 20 big PACs, using the strategy of helping the primary victor/challenger, could swing 359 votes with their 1977 level of expenditure. Only a couple of Senate elections since World War II, however, have been decided by such a narrow margin. Furthermore, an optimal strategy for defeating ideological opponents is not an optimal strategy for winning friends in the Senate. Giving heavily to challengers may occasionally unseat an incumbent, but it will probably leave dozens of angry, and reelected, incumbents. If companies like Chrysler and Lockheed had a long-term strategy to set up a favorable climate for loan guarantees, they could

not have done better than to give to a broad spectrum of incumbents, with special extra amounts for those closest to the corporation's "heart," and some money to promising challengers to spread the corporation's risk. This is, of course, exactly what the 20 large PACs tended to do (as seen in Table 5) in 1977-1978. Such a strategy may not elect hawks and oust doves, but it may be very helpful, at pork-barrel time, to one's bottom line.

Because business PACs are a growing and evolving phenomenon, one must be cautious about extrapolating any findings beyond the time span of the study. In order to carry this work into the present, to give the article greater historic range, and to make possible a dynamic analysis, PAC activity was examined in the off-year congressional elections on either side of the principal period studied—that is, in the election campaigns of 1973-1974 and 1981-1982. In the decade thus delineated, there was a steady growth of defense-related corporate giving to Senate campaigns. In 1973-1974, only the Hughes Aircraft PAC was very active among the major defense contractors, and total contributions from major defense PACs were slightly under $1,000 per Senate campaign (Table 7). By 1978, these contributions rose to around $9,000 per campaign, and by 1982 they had about doubled, to $17,000 per campaign.

Of course, adjusted for inflation, this increase is not as great, and with real dollars from all other PACs also increasing, twice as much spending from defense PACs does not necessarily convert into more political clout. Furthermore, the funds were increasingly given to incumbents rather than challengers and hence were even less likely than before to change the hawk/dove balance through direct electoral effects (except in open races, in which there is no incumbent). Nonetheless, it warrants investigation whether the new funding levels of the early 1980s finally got the attention of incumbent senators and produced some measurable political influence on their general defense voting. To examine this question, data were collected for the 1981-1983 period, as follows:

(1) Defense PAC contributions were measured for each senator in 1981-1982.
(2) A new defense voting scale was constructed for the 1983 session of the Senate. The 1983 defense scale, constructed in essentially the same manner as the 1977 scale, consists of the votes shown in Table 9. (See Table 10 for the correlations between the resultant scale and the other defense voting scales discussed in this article.)

TABLE 7
Contributions from PACs of Sixteen Largest Prime
Defense Contractors, 1973-1982

Years	$ to Incumbents' Campaigns*	$ to Opponents' Campaigns*	Total $*	Ratio of Incumbents' to Opponents' $*
1973-1974	$ 503	$ 168	$ 771	3:1
1977-1978	7,177	2,235	9,412	3:1
1981-1982	15,536	1,396	16,932	11:1

*All figures are total contributions from all sixteen PACs, divided by the number of senators running for reelection.

The senators in the 1978 cohort last campaigned in 1972, when there was no defense corporate PAC activity. Nor were individual contributions from executives of large defense corporations important in the pre-PAC era. For example, in 1973-1974, contributions over $500 from individual defense-corporate executives of the 16 largest prime contractors averaged only $100 per Senate campaign and constituted only about 0.01% of a senator's total funds available (compiled from Common Cause, 1976). (In contrast, oil executives gave approximately 1% of all funds available in the same year; see Wayman and Mitchell, forthcoming.) In short, the 1978 defense PAC contributions represented the first significant defense industry campaign funding for the Senate cohort up for election that year, and the hypothesis is that this new funding, albeit modest, would make the voting of those supported more hawkish, in comparison to those not supported.

As for the 1982 Senate cohort, they had received some modest defense PAC funding in 1975-1976, but they averaged several times more support in 1981-1982. It is hypothesized that under the impact of these increased dollars, those who received defense PAC funding in 1981-1982 would move to a more hawkish position vis-à-vis those who did not receive such funding.

The 1978 funding hypothesis is not supported by the data (see Table 10). Whether one operationalizes funding in terms of total dollars or per capita dollars, in terms of net contributions or gross contributions to incumbents or opponents, the coefficients are consistently small, always insignificant, and even occasionally in the wrong direction.

TABLE 8
Correlations Between Defense Voting Indices, 1967-1983[a]

	Defense 1967	*ABM 1970*	*Defense 1977*	*Defense 1983*
Defense 1967 (Russett)	1.0	.86 (N=40)	.82 (N=38)	.72 (N=16)
ABM 1970 (Bernstein and Anthony)		1.0	.81 (N=49)	.84 (N=23)
Defense 1977			1.0	.83 (N=57)
Defense 1983				1.0

a. Compiled for senators serving in 1977. Pearson product-moment correlation coefficients. All correlations are significant at the .001 level.

TABLE 9
Roll-Call Votes for Defense Voting Index, 1983

ICPSR No.	*Yeas*	*Nays*	*Subject*
2	81	11	a vote to nominate Richard Burt to the State Department;
55	57	42	a vote to nominate Kenneth Adelman to ACDA;
114	59	39	a vote to permit the use of funds to conduct MX test flights;
180	50	49	a vote to kill an amendment that would have prohibited the production of lethal binary chemical munitions;
214	41	58	a vote to bar the use of funds for procurement of the MX missile;
217	83	15	a vote to authorize $199 billion for weapons procurement, military research, operations, and construction at DoD, and for defense-related programs of D.O.E.;
317	58	40	a vote to kill an amendment calling for a mutual and verifiable freeze on and a reduction in nuclear weapons; and
329	42	50	a vote to advocate a bilateral moratorium on flight tests of ICBMs with MIRVs.

TABLE 10
Regression of Defense Voting (1983) on Defense PAC Contributions
(1978, 1982) and Lagged Defense Voting (1977)[a]

Independent Variables	N	Beta	T-Stat.	Signif.[b]	Mult. R^2	Bivariate r^2 with Difference of Defense Voting Scores (1977-1983)
Defense voting'77	15	.81	4.3	.001	.74	.03
PAC $ to incumbent'78		-.08	-.4	.68		
Defense voting'77	15	.86	5.9	.0001	.74	.04
PAC $ to opponent'78		-.09*	-.6	.53		
Defense voting'77	15	82	4.2	.0001	.74	.04
Net PAC $'78		-.06	-.3	.76		
Defense voting'77	15	.84	5.7	.0001	.74	.01
PAC $ to incumbent per capita,'78		-.10	-.6	.53		
Defense voting'77	15	.85	5.4	.0002	.73	.01
PAC $ to opponent per capita,'78		.01	.1	.93		
Defense voting'77	15	.84	5.6	.0001	.74	.01
Net PAC $ per cap.'78		-.10	-.7	.52		
Defense voting'77	26	.68	5.1	.0000	.69	.03
PAC $ to incumbent'82		-.25	-1.9	.07		
Defense voting'77	26	.75	6.0	.0000	.66	.03
PAC $ to opponent'82		.17	1.4	.17		
Defense voting'77	26	.65	4.9	.0001	.71	.04
Net PAC $'82		-.30	-2.3	.03		
Defense voting'77	25	.77	5.1	.0000	.66	.01
PAC $ to incumbent per capita,'82		-.07	-.5	.65		
Defense voting'77	25	.76	6.3	.0000	.69	.06
PAC $ to opponent per capita,'82		.21	1.7	.10		
Defense voting'77	25	.76	5.0	.0001	.66	.01
Net PAC $ per capita,'82		-.09	-.6	.56		

a. Table also includes bivariate r^2 between PAC $ and the difference of the standard-
ized scores of each senator on the defense voting scales of 1977 and 1983.
b. Reported significance levels are for two-tailed tests.
*This coefficient is in the "wrong" direction.

By 1982 the picture changes somewhat. Although the dominant
predictor of the voting remains previous voting patterns, some in-
dicators of PAC activity (particularly net dollars) show signs of a
modestly significant statistical effect. These are not large effects by

any means. A sense of their magnitude can be had by examining the r^2s between the 1981-1982 PAC contributions and the change in voting (1977-1983). The highest r^2 (Table 10) is .06. But one would not expect large effects from what are, by the standards of this decade's campaign expenses, modest sums. It is interesting that a significant effect has been detected at all. This suggests that the PAC spending patterns will deserve further attention in the future, particularly if they continue to grow in real dollars as the 1980s unfold.

CONCLUSIONS

One approach to the arms race is to assert that a military-industrial complex accelerates technological change and amplifies hostile action-reaction processes in order to increase its influence on American society. Congress is often seen as a tool in this process. This study has not found any strong support for that theory. Senators' roll-call voting (1) is at best weakly associated with their state's economic base; (2) was in the most recent election weakly associated with contributions from defense-corporate PACs but had not been so associated previously; and (3) is associated with the voting pattern of the other senator from the same state but is weakly related to predecessors' hawkishness/dovishness. The roll-call voting of senators on defense, in short, is most strongly associated with their own general voting tendencies, as measured by ADA rating. Perhaps the workings of the military-industrial complex are more subtle than those measured here. Perhaps they work more at the level of the individual firm buying access and favors than at the broader level considered in this article. Perhaps, however, the findings of other studies will reinforce what has been found in this study, and we will discover that the domestic roots of the arms race are to be sought more often in the realm of social psychology and bureaucratic politics than in industrial economics. Although these important questions cannot be resolved here, this article may contain enough nonobvious findings to shake up those who have become too comfortable with the conventional wisdom on these topics.

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