Buttery Guns and Welfare Hawks: The Politics of Defense Spending in Advanced Industrial Democracies

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In this article, we present a new theory that, given the economic consequences of military spending, some governments may use military spending as a means of advancing their domestic non-military objectives. Based on evidence that governments can use military spending as welfare policy in disguise, we argue that the role of ideology in shaping military spending is more complicated than simple left-right politics. We also present a theory that strategic elites take advantage of opportunities presented by international events, leading us to expect governments that favor more hawkish foreign policy policies to use low-level international conflicts as opportunities for increasing military spending. Using pooled time-series data from 19 advanced democracies in the post–World War II period, we find that government ideology, measured as welfare and international positions, interacts with the international security environment to affect defense spending.

Overview

Most studies of the politics of military spending have focused on the dynamics of arms races between superpowers.[1] In this article, we advance a theory about the politics of military spending in lesser powers. The argument has been made elsewhere (Palmer 1990) that these internationally weaker nations have an incentive to shirk in their military spending, relying instead on the protection of the superpower with whom they are most closely aligned. We present a new theoretical argument that, given the economic consequences of military spending, some governments may use military spending as a means of advancing their domestic non-military objectives.[2] Our theory of military spending as welfare policy in disguise relies heavily on the empirical evidence that governments do not face a trade-off between "guns" and "butter."

Although "guns vs. butter" is one of the best-known clichés about policy trade-offs faced by governments, a wealth of political economy literature has demonstrated empirically that this trade-off is not so straightforward. In particular, this popular notion about politics ignores the domestic welfare consequences of military spending. The findings from works that examine the impact of military spending on economic growth and employment mostly suggest a rephrasing of the cliché to something along the lines of "guns yield butter" (e.g., Best and Connolly 1976; Hooker and Knetter 2001; Mintz and Stevenson 1995). In this article, we present and test a theory of military spending that shows how this policy dynamic together with international conflict influence governments' spending decisions. Note that most of the conflicts involving democratic nations since World War II have not been nation-threatening. These types of low-intensity conflicts provide opportunities for strategic elites to increase or

[1]Supporting Information and replication materials are available at webpages.acs.ttu.edu/larwilli.

[2]In order to analyze in a cross-national fashion the emphasis that countries devote to their militaries, we examine military expenditures as a percentage of gross domestic product. Since this measure takes into account the amount of military spending relative to the GDP, this is an adjusted version of military expenditures.

decrease military expenditures. We therefore expect to see interactive relationships between government ideology and conflict involvement as determinants of military spending.

Because of the strong evidence that governments can use military spending as welfare policy in disguise, we argue that the role of ideology in shaping military spending is more complicated than simple left-right politics. We expect that governments cognizant of the welfare-enhancing role of military spending will use these expenditures to pursue their goals in terms of both domestic welfare politics and international power relationships. Even if preferences for generous (austere) welfare policies line up perfectly with dovish (hawkish) foreign policy preferences, standard measures of left-right positions of governments will be problematic for explaining how they tailor military spending to fit their policy goals. This is the case because a single ideological measure would encompass conflicting policy pressures. For instance, we would expect left-wing governments to increase military spending because of their welfare policy preferences, but we also would expect left governments to decrease military spending because of their dovish foreign policy preferences. If welfare policy preferences do not line up perfectly with foreign policy preferences, scholars need to consider the positions of governments on two distinct dimensions in order to understand how they will shape military spending. In the extant literature on the influence of government ideology on military spending, government ideological positions have been collapsed onto a single left-right scale, based on the assumption that hawkish foreign policies should occur among more right-wing governments. We propose replacing this with a two-dimensional conceptualization of government ideology that allows for a full range of combinations of government ideology in terms of welfare and international policies. Our study is the first to model the impact of government ideology in two dimensions on military spending.

When considering the impact of ideology on military spending, we must also take into account the conflict environments in which governments make spending decisions. In the face of a conflict that threatens a nation's existence, we expect any government, regardless of ideological position, to increase military spending as much as possible. In the period since World War II, however, this type of conflict has been very rare. The types of lower-level conflicts that have characterized this era provide ample opportunities for politicians to take advantage of and justify new budgetary allocations. Yet most previous works in this area have modeled the effects of government ideology and international events on military spending in additive specifications (e.g., Ostrom 1978). Implicit in this type of specification is a fairly restrictive assumption that government ideology does not interact with international events to influence military spending. In this article, we present an argument in which strategic elites take advantage of opportunities presented by international events; therefore, we expect governments that favor more hawkish foreign policy policies to use low-level international conflicts as opportunities for increasing military spending.

In the sections that follow, we begin with a brief review of the literature on the impact of military spending on domestic economics, continuing with a discussion of the previous literature on the determinants of military spending, and proposing modifications to these models. In the fourth section of this article, we introduce and show patterns for measures of government positions along separate welfare and international policy dimensions. Then, we discuss our models of military spending and present a series of simulations to help interpret our findings and conclude.

The Welfare Consequences of Military Spending

The political economy trade-off implied by the phrase "guns vs. butter" has not fared well in either of the two lines of empirical research that it has inspired. In the first, scholars have attempted to test directly the theoretical proposition implied by "guns vs. butter" by including measures of military spending in their models of social spending. The reasoning behind this approach is that if there is such a trade-off, then we should see a negative relationship between these two areas of spending. In the second line of research, scholars have included military spending in models of economic growth and employment. The logic of this less direct approach is that, to the extent that military spending decreases real growth and employment, there is a negative trade-off between military spending and social welfare.

Studies that directly measure the relationship between military expenditures and social spending have found the expected negative relationship in only limited cases. In a study of the relationship between military and social expenditures in the United States between 1941 and 1979, Russett concluded that "the absence of a relationship between federal military and social spending appears to be quite robust" (1982, 774). Palmer (1990) argued that the existence of a negative trade-off was contingent on alliance politics, and he found that a statistically significant negative relationship existed between military expenditures and social spending only in those

nations that were relatively small military contributors to large military alliances. In a historical case study of nine major arms buildups by democratic nations, Narizny (2003) found that in only one of his nine cases (the United States during the buildup from 1979 to 1986) was a massive arms buildup accompanied by cuts in social expenditures. Other studies find no short-term trade-off between defense and welfare spending, and instead stress the constraining effects of fiscal policy on defense spending (Domke, Eichenberg, and Kelleher 1983; Su, Kamlet, and Mowery 1993). From this literature, we can conclude that the evidence of a "guns vs. butter" trade-off is, at best, limited.

While the first line of research on the "guns vs. butter" trade-off took a direct approach and found ambiguous evidence, the second approach examines the relationship less directly by examining the impact of military spending on economic growth and employment and finds evidence in the opposite direction—military spending has a positive impact. If there is a "guns vs. butter" trade-off, then we should see a negative relationship between military spending and economic growth. But, in the most comprehensive study of this relationship to date, Mintz and Stevenson found that only in Canada and Nicaragua, two of their 103 cases, was there a statistically significant negative relationship between military spending and economic growth (1995).[3] The effect of military spending on economic growth was positive and statistically significant at conventionally accepted levels for seven cases and statistically indistinguishable from zero in 94 cases. The "guns vs. butter" trade-off also implies a negative relationship between military expenditures and employment. But studies of this relationship have consistently found a statistically significant multiplier effect of military spending on employment (Best and Connolly 1976; Hooker and Knetter 2001). This effect works in two ways: as a payroll effect, by increasing the number of civilian and military personnel employed by the defense sector, and as a purchasing effect, by increasing the level of military expenditures on goods and services (Sasaki 1963). This relationship appears to work stronger in reverse; cuts in military spending are followed by employment reductions, partly due to the difficulty in converting specialized military industries to civilian purposes (Brauer and Marlin 1992; Hooker and Knetter 2001).

Taken together, these two bodies of research imply that politicians do not make guns versus butter trade-offs, nor should they. To the extent that military spending affects domestic economies, it appears to do so in a fashion

[3]Their approach was to add measures of military spending to neoclassical models of economic growth.

that implies a "guns yield butter" relationship; an increase in military spending may or may not increase economic growth, but it is likely to increase employment. If we put aside for the moment the foreign policy implications of military spending, these findings suggest partisan priorities for military spending that would otherwise seem counterintuitive. Given the priority that supporters of left-wing parties place on employment (e.g., Hibbs 1979), we should expect pro-welfare politicians to view military spending as one of the policy tools available to stimulate employment growth. Given that employment growth tends to lead to inflation, more right-wing governments may be inclined (ignoring foreign policy consequences) to decrease or hold constant military spending.

In spite of these empirical findings about the impact of military spending, one might still reasonably ask why a government would choose to use such an indirect approach to accomplish its macroeconomic goals. An excellent set of answers to this question can be found in Nincic and Cusack's (1979) classic work on the political-business cycle of U.S. military spending. These authors argued that guns were a politically and otherwise efficient means for yielding butter on three grounds. First, defense spending increases may be justified to fiscal conservatives by grounding them in national security terms. Second, unlike other types of spending, military spending can supplement the private sector and does not compete directly with private investment. And third, military spending creates a large opportunity for capital purchases because machinery quickly becomes obsolete (112).

The Determinants of Military Spending

Prior research on the determinants of military spending varies substantially in terms of the relative weights placed on international and domestic factors. Some scholars have argued that the international arena dictates the security environment, which, in turn, constrains domestic leaders to a small range of options regarding military spending. Others contend that while the international arena is immensely important, incorporating domestic influences also is crucial to forming an accurate picture of the determinants of military spending. This literature has, however, largely overlooked the possibility of interactive relationships between domestic and international factors in shaping military spending. This perhaps is due to its heavy focus on the United States during the post–World War II era, but the combination of being a superpower and having a fairly limited domestic ideological spread

across the two political parties makes the United States unusual even among advanced industrial democracies.

In a classic work where he argues that international factors dominate military spending decisions, Richardson (1960) found that U.S. military spending was largely a reaction to the threat posed by Soviet military spending. As the Soviet threat increased, U.S. military spending followed suit. Given the Cold War context and the fact that Richardson was trying to explain the behavior of one of the two superpowers in that era, this focus on the United States seems reasonable. However, not all scholars studying this same case were in agreement. Ostrom (1978) argued for a more comprehensive theory of the determinants of military spending that melded three theoretical explanations (the arms race, organizational politics, and the bureaucratic politics perspectives) into a reactive linkage model. He found that U.S. military spending was largely a response to anticipated Soviet spending, but the effect was filtered through key domestic actors including the president, Congress, and the Department of Defense. From these results, Ostrom theorized that the request for military funds was a reaction to changing domestic and international conditions, which were filtered through the domestic bureaucracy to determine the magnitude, scope, and timing of the subsequent reaction. Ostrom reports having tried government ideology in one of the five equations in his system of equations, but that he dropped this variable because it did not yield "the desired results" (Ostrom 1978, 955).

While international factors played a dominant role in both the Richardson and Ostrom models of military spending, Nincic and Cusack (1979) presented a theory in which domestic political and economic factors played dominating roles by constraining or facilitating increases in military spending. According to their model, military spending presents governments with an additional mechanism to artificially increase aggregate demand at strategically crucial points in the domestic political calendar. Governments use military spending for the now-familiar purpose of stimulating short-term economic demand as a means to improve naive voters' assessments of their economic management skills and thereby improve their prospects for reelection. In Nincic and Cusack's empirical analysis of the U.S. case, they found that military spending is two billion U.S. dollars higher in the two-year period leading up to a presidential election, yet faces a similar decline in the two years following an election (1979). An extension of this model performed quite well, as it explained military spending in the United States, the Soviet Union, and China better than a model dealing specifically with international threats (Cusack and Ward 1981). Along these same lines, Bolks and Stoll (2000) found that

the spending decisions of major powers became more detached from the actual threats in the foreign policy environment during the latter years of the Cold War.

One of the shortcomings that we see with published empirical models of military spending is the lack of interactive theories and model specifications to account for the interplay between government ideology and international factors. An important recent exception to this is a study by Fordham in which he examined the interaction between Soviet nuclear threat and government ideology in determining U.S. military spending during the Cold War era (Fordham 2003). He modeled the relative expenditures by the United States on strategic versus other types of military needs and found that Republican administrations consistently preferred strategic spending. When faced with a lower (higher) Soviet strategic threat, Democratic presidents tended to spend a greater (lesser) amount on conventional versus strategic military allocations. This greater emphasis on conventional forces by Democratic administrations is consistent with the domestic economic priorities commonly attributed to the party, since spending on strategic forces is likely to have less of an employment multiplier effect.

Reconsidering Ideology

The influence of government ideology on military spending has been relatively neglected. Perhaps this is the case because most studies of military spending have focused on the United States, where the two-party context offers little variance. When studies of military spending have ventured outside of the United States, government ideology becomes more complex with coalition governments and a wider range of party ideologies.

One of the few studies to look at the influence of ideology and other factors on military spending across nations and over time was conducted by Eichenberg and Stoll (2003). In their analysis of public support and spending practices in five democracies, they use partisanship as a key control variable. Contrary to conventional wisdom and scholarly expectations, they found that some leaders from the left increased military spending while some on the right reduced. Eichenberg and Stoll did not delve too far into why this was the case, but they summarized their findings as follows:

> Even a cursory study of European and American chief executives would reveal some on the "left" who were proponents of a strong defense—or at least proponents of a balanced commitment

to defense and negotiation (Kennedy or Johnson in the United States and Helmut Schmidt in Germany come to mind). In addition, in Europe especially, parties of the right are actually parties of the center-right—few Christian Democrats or Gaullists question the consensus that surrounds the commitment to the welfare state. Finally, it is worth noting that the end of the cold war and the consequent reductions in defense spending occurred in some prominent cases under Conservatives: Bush, Thatcher/Major, Kohl, and—partially—under conservatives in Sweden and France. (Eichenberg and Stoll 2003, 413)

Other researchers have focused on the traditional left-right dimension with an implicit assumption that all other relevant ideological dimensions map neatly onto this single dimension. In support of this assumption, a cross-national study by Klingemann, Hofferbert, and Budge (1994) found that right-wing parties tended to be pro-military and in favor of a strong national defense, while left-wing leaders tended to be pro-peace (see also Schultz 2001). Relatedly, Koch and Cranmer (2007) showed that other states tend to view right-wing leaders as more hawkish.

While this amalgamation of ideologies into a single left-right dimension may be appropriate for the purposes of many studies in international relations, the competing theoretical claims that we discussed above make this problematic for studies of military spending. Given previous empirical findings on the economic impact of military spending, we should expect that, holding all other factors constant, left-wing governments will spend more than right-wing governments. If, however, right-wing governments are more hawkish than left-wing governments, we should expect ideology to have the opposite effect on military spending. Condensing government ideology to a single dimension becomes even more problematic when we think about how ideology interacts with international events to shape military spending. In the face of severe threats to national sovereignty, we would expect all governments, regardless of ideology, to increase military spending. However, during lower-stakes conflicts such as those that have involved democratic nations during the post-war era, we should expect ideology to play a substantial role in how governments alter military spending. Low-level conflicts provide opportunities for hawkish governments to justify increases in military spending, while dovish governments can afford to ignore these types of conflicts as they pose no substantial threat to national survival and may even continue to cut back on military expenditures. Governments that favor generous welfare

TABLE 1 Expectations for Defense Spending Given Government Characteristics and Low-Level Conflict Involvement

| | Conflict Involvement | |
Ideological Characteristic	No Conflict	Some Conflicts
Hawk	+	++
Dove	−	−
Generous	++	+
Austere	− −	−

Note: "+" indicates positive relationship.
"++" indicates stronger positive relationship.
"−" indicates negative relationship.
"− −" indicates stronger negative relationship.

policies may also use low-level conflicts to increase military spending while simultaneously enjoying the short-run welfare-enhancing effects of such conflicts.[4]

Table 1 presents a summary of our theoretical expectations across four ideological characterizations of governments, depending on whether or not the nation is involved in low-level international conflict. In the absence of conflict, we expect governments' welfare positions to dominate international positions in the determination of military spending. Governments favoring more generous social assistance will increase military spending as a form of welfare policy in disguise, while governments favoring austerity will decrease military spending. During times of peace, holding constant welfare positions, we expect more hawkish governments to increase military spending. We expect that this positive relationship between hawkishness and military spending will be stronger during times of conflict when international positions are more influential than welfare positions in determining government spending.

Empirical Testing

Our theoretical model of military spending in democratic nations is as follows:

$$M_{it} = f(M_{it-1} + I_{it} + C_{it} + I_{it} \times C_{it} + G_{it} + N_{it-1} + W_{t-1})$$

[4]This would be consistent with Fordham's (1998) finding that conflict abroad may improve unemployment by reducing labor costs. Since these governments are expected to increase military spending as a way of achieving economic goals, we would expect them to cut back on doing so when these goals are met through other means.

where

- M_{it} is the level of military spending by nation i during year t. In order to make this measure comparable across nations and over time, we calculated it as real military spending as a percentage of GDP.[5]
- M_{it-1} is the level of real military spending by nation i during previous year $t - 1$. This term is included in our specification to account for the incremental nature of budgetary decisions.
- I_{it} is government ideology (either a single value or a vector of two values, depending on the number of dimensions of government ideology that are relevant to military spending) of nation i during year t.
- C_{it} is the level of international conflict involvement for nation i during year t.
- G_{it} is a vector of control variables measuring government characteristics of nation i during year t that might affect military spending.
- N_{it-1} is a vector of control variables measuring aspects of the economic conditions and international position of nation i during year $t - 1$ that might affect military spending.
- W_{it-1} is a vector of control variables measuring the international climate in terms of the arms race between the United States and the Soviet Union/Russian Republic during year $t - 1$.

In order to maximize variation on all of these variables, we constructed a pooled annual data set of military spending as a percentage of GDP across democratic nations. This measure is consistent with previous comparative studies of government spending on both military and welfare (e.g., Bawn and Rosenbluth 2006; Haggard and Kaufman 2008; Hicken and Simmons 2008; Hicks and Swank 1992; Palmer 1990; Stasavage 2005), and such measures are desirable because they are comparable across nations and over time in terms of the proportion of available resources that the government chooses to expend on a particular policy area.[6] Data availability determined

most of our limitations in cases covered.[7] We did, however, decide to remove a handful of nations from our analyses because of circumstances throughout most or all of the time period.[8]

Given the pooled time-series nature of our data, we needed to control for the possibility of both autocorrelation and heteroskedasticity. In their now-famous article on pooled time-series analyses, Beck and Katz (1995) recommend correcting for autocorrelation first and then estimating panel-corrected standard errors to account for heteroskedasticity and contemporaneous correlation in the error processes. In the example analyzed by Beck and Katz, the inclusion of a lagged dependent variable on the right-hand side of their model was deemed a sufficient adjustment for autocorrelation. But as Kittel and Winner (2005) have shown, specification of a lagged dependent variable is not always the magic pill for curing all problems of inference associated with the dynamic nature of pooled time-series data. In particular, if the time series are nonstationary, problems of spurious inference will persist. We conducted tests for panel unit roots using a procedure developed by Im, Pesaran, and Shin (2003) and were able to reject the null hypothesis of non-stationarity.[9] To control for autocorrelation and also because of the

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[5]The Military Expenditures variable in the Correlates of War data set effectively captures measures of all resources devoted to military forces that could be deployed, irrespective of their active or reserve status (Singer, Bremer, and Stuckey 1972). Military spending is inflation-adjusted, with 1996 as the base year.

[6]There are a variety of alternatives to consider when deciding on the proper specification of the dependent variable for a study of budgetary expenditures across time and spatial units. For this study the two most reasonable alternatives are real expenditures and expenditures as a percentage of GDP. From our perspective, real expenditures were problematic because of the large differences in aggregate economic activity across the nations that were our spatial units for this study. We can control for this by putting real GDP on the right-hand side of our models, but the metric in the coef-

ficients to be interpreted would be rather obtuse. One criticism of expenditures as a percentage of GDP that we have encountered is that changes in GDP with constant levels of military spending lead to changes in our dependent variable. Although we understand that some readers might be uncomfortable with this, we encourage them to think about this dependent variable as a measure of the amount of total societal output that the leaders of a nation have chosen to devote to military expenditures. In this way, a decline in our dependent variable when GDP has risen but military expenditures have stayed the same is a reasonable representation of reality. After all, during economic expansions we would expect pressures for expansion of government spending in many areas including, all else being constant, military spending.

[7]The following countries and years are included in our analyses: Australia 1952–97, Austria 1957–95, Belgium 1954–95, Canada 1952–97, Denmark 1952–96, Finland 1952–95, France 1952–97, Greece 1974–96, Ireland 1952–97, Italy 1952–96, Netherlands 1952–96, New Zealand 1952–96, Norway 1952–97, Portugal 1976–78 and 1980–95, Spain 1977–96, Sweden 1953–97, Switzerland 1952–95, Turkey 1952–95, and United Kingdom 1952–97.

[8]We removed the United States because of its unique place in the international system as one of two superpowers involved in an arms race for much of the period covered. We removed Germany and Japan because of constitutional limitations on each nation's use of force. Finally, we removed Iceland because of its special relationship with the United States. Since 1941 the presence of U.S. military forces in Iceland has made any contribution that this nation might be able to make to its own defense trivial. Our general empirical results are robust to the inclusion of these four countries. Results for these estimations are provided in the Supporting Information file.

[9]The Im, Pesaran, and Shin test indicates that we can reject the null hypothesis of panel unit roots at the 99% confidence level ($Z_{\tilde{t}-bar} = -2.70$, p-value = 0.003). The tests for panel unit roots

incremental nature of budgetary processes, we specified all of our models with a lagged dependent variable. In order to control for heteroskedasticity, we estimated our models with panel-corrected standard errors.[10]

As discussed above, when we add the economic consequences of military spending to established theories of how left-right ideological positions affect military spending, our expectations become muddled. We expect more right-leaning governments to favor increased military spending because of their more hawkish positions on international relations. But more left-leaning governments may also favor increases in military spending because of the employment multiplier effects and other welfare-enhancing economic consequences. To untangle these dimensions, we constructed three different measures of government ideology: left-right position (ranging from large negative values for "far left" to large positive values for "far right"),[11] welfare position (ranging from high values for expressions of preferences for "generous" welfare policy to low values for "austere" policy preferences),[12] and international position (ranging from high values for "hawk" positions to low values for "dove").[13] We constructed these measures for each country in each year using data from the Comparative Manifestos Project (Budge et al. 2001).[14] In our models of military spending, we will first model government ideology as a single left-right dimension and then model it as varying in a two-dimensional space defined by welfare position and international position. Before we present the results of our models of military spending, it is worthwhile to take a look at these

developed by Levin and Lin (1992) echo these results. Based on these results, we conclude that our data are stationary.

[10]All models were estimated using STATA version 11.0 for Windows. We estimated our models using the "xtpcse" command with the "psar1" option. This option corrects for panel-specific autocorrelation.

[11]This variable is the Comparative Manifestos Project's (CMP) grand categorization of the ideological content of party manifestos, which includes a wide range of economic, political, and social statements.

[12]This variable was constructed from the CMP's measures of how much attention was spent on specific statements in favor of welfare policy spending minus statements opposing welfare spending.

[13]This variable was constructed from the CMP's measures of how much attention was spent on specific statements in favor of the military minus statements against the military spending and in favor of peace.

[14]Consistent with other studies of annual government spending patterns (e.g., Bawn and Rosenbluth 2006; Stevenson 2001), we weighted the positions of each governing party by both the proportion of time spent with at least one member of the party in the cabinet and the percentage of seats held by that party in the national legislature. For party positions between elections, we constructed measures weighted by temporal proximity to elections.

different measures of government ideology and how they correspond to one another.

Figure 1 displays a scatter plot of governments' international and welfare positions. If a single left-right dimension subsumed government positions on both of these dimensions, then in Figure 1, we would expect to see cases appear mainly in the upper-left and lower-right quadrants of this figure. This is clearly not the case, both visually and statistically ($r = -.34$). Almost 40% of our cases fall into the upper-right and lower-left quadrants, as defined by the median position on each dimension. This indicates that there are governments that possess more complex ideological positions than a single left-right dimension allows. Specifically, some combine austere welfare positions with dovish international positions, while others hold hawkish international positions together with generous welfare positions. This provides strong support for a two-dimensional conceptualization and model specification of how government ideology influences military spending. The points labeled with two letters in this figure identify the four different combinations of the 5% and 95% ends of the distributions of government welfare and international positions. For simulations based on the multivariate models below, we label the resulting four government archetypes as "austerity-hawk" (AH), "austerity-dove" (AD), "generous-hawk" (GH), and "generous-dove" (GD).

In Table 2, we present a summary of the theoretical expectations and data sources for the independent variables in our analyses. For our measure of international conflict involvement, we constructed a composite measure of MID involvement within each year by summing the hostility scores for all MIDs involving each particular nation in each year. We expect the impact of these events on military spending to be fairly immediate; thus we specify them in our models at year "t." The variables "CINC" and "Alliance" measure aspects of each nation's international position that might affect military spending. CINC scores control for the possibility that relatively more or less powerful nations might differ in terms of military spending, and our dummy variable for alliance involvement with the United States accounts for the possibility that such nations might be inclined to free ride on the superpower nation with which they are aligned. Although our measure of the dependent variable controls for relative economic size across nations and over time, we wanted to control for the possibility that a government whose nation has experienced high (low) levels of economic growth might be inclined to spend more (less) on the military as a percentage of GDP; therefore, we include "Real Growth in GDP." To reflect our expectation that these variables will work more slowly and through the

FIGURE 1 Distribution of Government Positions Across Two Dimensions
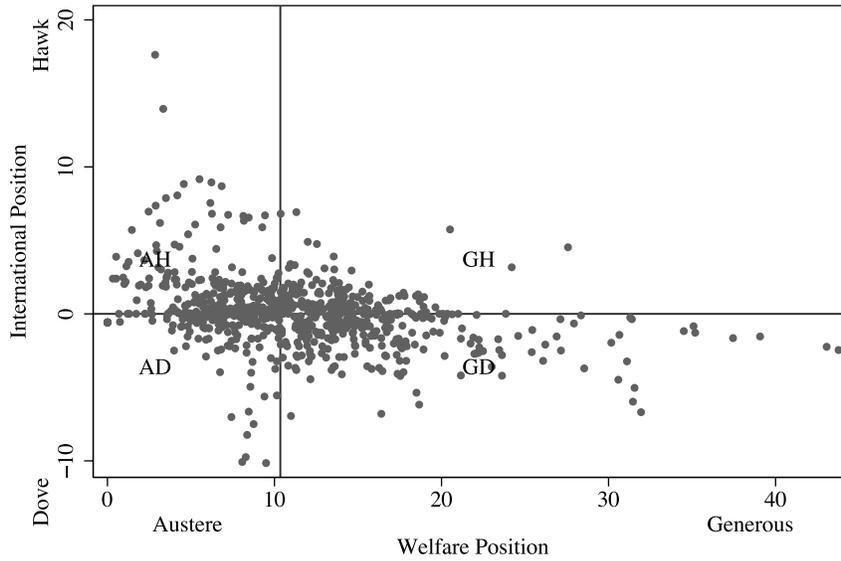
Note: Lines depict the median value for each variable. Abbreviations depict the four archetypes used in the simulations: Austerity–Hawk, Generous–Hawk, Austerity–Dove, and Generous–Dove.

regular budgeting cycle, we specify them in our models at year "$t − 1$."[15]

To control for various aspects of politics other than government ideological positions, we include measures of the "number of government parties," "minority government," and "election year." Previous studies have found that the number of government parties is positively related to overall government spending as a percentage of GDP (Bawn and Rosenbluth 2006). Minority governments are, by definition, constantly in danger of being voted out of power and may be inclined to increase spending across the board to appease various parties in and out of government. Previous literature has shown that governments of all stripes tend to spend more in election years (e.g., Nincic and Cusack 1979).

In Table 3, we present two additive models of military spending. In the first model, we have specified government ideology along a single left-right dimension, while in the second model we have specified government ideology in terms of government welfare and international

positions. In this initial look at the determinants of military spending, we ignore our theory that there will be an interactive relationship between government ideology and conflict involvement in determining military spending (i.e., we have left out the $I_{it} \times C_{it}$ terms from the theoretical specification above). Although both of these models fit the dependent variable equally well ($R^2 = .92$), the parameter estimates for the ideology variables support our argument for a two-dimensional specification of government ideology. In the one-dimensional model, the effect of left-right ideology is substantively quite small and barely achieves statistical significance by conventional standards.[16] This negative parameter estimate indicates that, holding all else constant, right governments tend to have lower military spending. The results for our two-dimensional model are statistically significant in the expected direction, indicating that more hawkish governments and those that favor more generous welfare policies tend to have higher levels of military spending. Across both specifications, we see the same general pattern for

[15]This is fairly typical in models of budgetary processes. Although we have specified our political variables at time "t," it is worth noting that a case can also be made for specifying them at both time "t" and "$t − 1$." When we estimated models with this specification, we found the same pattern of results, but not too surprisingly also encountered substantial multicollinearity. For ease of presentation and because our theory about the interaction between government ideology and conflict involvement is more immediate, we have specified all political variables at time "t."

[16]Throughout this article, we report p-values for two-sided t-tests. This is appropriate for the parameter estimate for government left-right position, since we have conflicting theoretical expectations for this variable. In the case of government welfare and international positions, however, we have clear directional expectations and should, strictly speaking, report p-values for one-sided t-tests. For the sake of clarity, we have indicated statistical significance throughout our tables of results using two-sided t-tests.

TABLE 2 Independent Variables and Expected Relationships

Independent Variable	Equation	Expectation	Operationalization (Sources)
Military Expenditures as a % of GDP$_{t-1}$	M_{it-1}	+ Budget data should move incrementally	Military Spending/GDP (CINC, PWT)
Real Growth in GDP$_{t-1}$	N_{it-1}	+ Economic growth should allow more spending	(PWT)
CINC$_{t-1}$	N_{it-1}	+/− Control variable	(CINC)
Alliance$_{t-1}$	N_{it-1}	− Allies with U.S. have incentives to spend less	Alliance with U.S. dummy (Correlates of War)
Conflict Involvement (MIDs Composite)	C_{it}	+ greater conflict leads to greater spending	Sum of MID Hostility Score for All MIDs in that Country-Year (MID)
Minority Government	G_{it}	+ minority governments face pressure from inside and outside to increase spending	(WKB)
Number of Government Parties	G_{it}	+ more parties, more spending	(WKB)
Election Year	G_{it}	+ elections induce higher spending	(CMP)
Government Left-Right Position	I_{it}	−/+ conflicting expectations	weighted "rile" variable (CMP and PG)
Government L-R Position × Conflict Involvement	$I_{it} \times C_{it}$	+/− conflicting expectations	
Government Welfare Position	I_{it}	+ military spending is another way to reduce unemployment	weighted "welfare" variable (CMP and PG)
Government Welfare Position × Conflict Involvement	$I_{it} \times C_{it}$	− less military spending with greater conflict because of short-term stimulus of conflict	
Government International Position	I_{it}	+ hawks expected to spend more	weighted "hawk" variable (CMP and PG)
Government International Position × Conflict Involvement	$I_{it} \times C_{it}$	+ hawks expected to spend more with more conflict	

CINC: Composite Indicators of National Capabilities (COW)
MID: Militarized Interstate Disputes
CMP: Comparative Manifestos Project
PG: Party Government Data Set
WKB: Woldendorp, Keman, and Budge (2000)
PWT: Penn World Tables 6.1

the other independent variables. As expected, conflict involvement has a strong positive effect on military spending,[17] and changes in U.S. military expenditures positively relate to changes in military spending. None of the other variables in our model achieved statistical significance at conventionally accepted levels.[18]

[17]A reasonable alternative hypothesis might suggest that military spending drives conflict involvement. To test for this, we estimate a model of conflict involvement as a function of lagged military spending and variables assessing a nation's position internationally. The coefficient on military spending is positive but not statistically significant at conventionally accepted levels ($p = .51$). These results are available from the authors upon request.

[18]As we discuss below, the parameter estimates and standard errors for models that include a lagged dependent variable are the

In Table 4, we present the same two models with interactions between our measures of government positions and conflict involvement. As we argued, our theoretical expectations for the left-right model continue to be unclear due to the competing expectations of the underlying policy pressures. For the two-dimensional model, we expect to find that governments with more generous positions on welfare will spend more than austere governments, except when they are involved in international conflict. More hawkish governments should spend more than dovish governments, especially in the face of

expected short-term change in the dependent variable from a one-unit increase in the independent variable. We therefore also include estimates of the long-term effects in Tables 3 and 4.

TABLE 3 Additive Models of Defense Spending

Independent Variable	One-Dimensional Model		Two-Dimensional Model	
	β	L.T.E.	β	L.T.E.
Military Exp. (% of GDP)$_{t-1}$	0.932***		0.933***	
	[0.896, 0.968]		[0.896, 0.970]	
Gov't Left-Right Position	−0.002*	−.025*		
	[−0.003, 0.000]	[−.057, .001]		
Gov't Welfare Position			0.006***	0.099**
			[0.001, 0.011]	[0.016, 0.214]
Gov't International Position			0.009*	0.154*
			[−0.003, 0.021]	[−0.043, 0.440]
Conflict Involvement	0.005*	0.082*	0.006**	0.094**
	[−0.000, 0.011]	[−0.000, 0.205]	[0.000, 0.011]	[0.007, 0.224]
Minority Gov't	0.036	0.557	0.033	0.500
	[−0.026, 0.099]	[−0.372, 1.674]	[−0.028, 0.094]	[−0.504, 1.563]
Number of Gov't Parties	0.009	0.136	0.009	0.165
	[−0.013, 0.030]	[−0.221, 0.510]	[−0.011, 0.030]	[−0.154, 0.602]
Election Year	0.009	0.143	0.008	0.160
	[−0.043, 0.060]	[−0.655, 1.007]	[−0.044, 0.060]	[−0.747, 1.189]
Real Growth in GDP$_{t-1}$	0.610	9.806	0.634	11.107
	[−0.458, 1.679]	[−6.352, 33.146]	[−0.429, 1.696]	[−6.427, 34.54]
CINC$_{t-1}$	1.371	20.098	1.999	28.830
	[−3.006, 5.749]	[−57.815, 88.56]	[−2.361, 6.358]	[−52.105, 105.758]
Alliance$_{t-1}$	0.019	0.255	0.034	0.453
	[−0.051, 0.090]	[−0.937, 1.253]	[−0.034, 0.101]	[−0.739, 1.356]
US/USSR CINC Ratio$_{t-1}$	−0.031	−0.523	−0.034	−0.618
	[−0.160, 0.098]	[−3.034, 1.487]	[−0.162, 0.094]	[−3.277, 1.513]
Change in US Mil. Exp.$_{t-1}$	0.058**	0.891*	0.056**	0.915***
	[0.005, 0.111]	[−0.022, 2.024]	[0.004, 0.109]	[0.041, 2.402]
Constant	0.122		0.038	
	[−0.052, 0.295]		[−0.143, 0.220]	
Observations	776		776	
R^2	0.924		0.922	

Note: The dependent variable in both models is military expenditures as percentage of GDP. The 95% confidence intervals for the coefficients are calculated with panel-corrected standard errors (adjusted for panel-specific AR1 processes). The 95% confidence intervals for the long-term effects are calculated with Clarify (King, Tomz, and Wittenberg 2000).
***p < 0.01, **p < 0.05, *p < 0.1.

conflict. Because our theories and model specifications are interactive, it is best to show the implications of these models graphically (Brambor, Clark, and Golder 2006; Braumoeller 2004; Kam and Franzese 2007). To get an initial look at the statistical significance of the results presented in Table 4, we produced a series of graphs as suggested by Brambor, Clark, and Golder (2006). For each interactive relationship, we plot the estimated marginal effect of each variable across the range of values for the variable with which it has been interacted. Because there are two variables in each of our interactions, we have

two plots for each interactive relationship presented in Table 4.

Figure 2 shows the estimated effects of government right-left position and conflict involvement from the one-dimensional model. From the left panel in this figure, we can see that the effect of ideology is only barely significant when there is little or no conflict involvement. The coefficient is negative, indicating that the more to the right a government is, the less it will spend. From the right panel we can see that the estimated effect of conflict involvement is flat across the range of values for right-left

TABLE 4 **Interactive Models of Defense Spending**

| Independent Variable	One-Dimensional Model		Two-Dimensional Model	
	β	L.T.E.	β	L.T.E.
Military Exp. (% of GDP)$_{t-1}$	0.932***		0.932***	
	[0.896, 0.968]		[0.895, 0.970]	
Gov't Left-Right Position	−0.002*	−.026*		
	[−0.003, 0.000]	[−.064, .0002]		
Gov't Welfare Position			0.007**	0.110**
			[0.002, 0.012]	[0.030, 0.230]
Gov't International Position			0.008	0.131*
			[−0.004, 0.019]	[−.067, 0.442]
Conflict Involvement	0.005*	0.086*	0.013**	0.213***
	[−0.000, 0.011]	[−.004, 0.206]	[0.002, 0.024]	[0.043, 0.502]
Gov't Left-Right×Conflict	0.00001	0.0003		
	[−0.000, 0.000]	[−0.004, 0.004]		
Gov't Welfare×Conflict			−0.001	−0.011*
			[−0.002, 0.000]	[−.032, 0.007]
Gov't International×Conflict			0.001	0.019
			[−0.002, 0.004]	[−0.028, 0.086]
Minority Gov't	0.036	0.527	0.033	0.521
	[−0.026, 0.099]	[−0.489, 1.657]	[−0.028, 0.093]	[−0.364, 1.590]
Number of Gov't Parties	0.009	0.136	0.009	0.148
	[−0.013, 0.030]	[−0.214, 0.514]	[−0.012, 0.029]	[−0.187, 0.561]
Election Year	0.008	0.141	0.006	0.090
	[−0.044, 0.060]	[−0.768, 1.213]	[−0.046, 0.058]	[−0.830, 1.064]
Real GDP Growth$_{t-1}$	0.601	10.002	0.529	9.211
	[−0.481, 1.683]	[−7.096, 34.244]	[−0.549, 1.608]	[−8.833, 35.820]
CINC$_{t-1}$	1.407	21.258	1.935	29.505
	[−3.019, 5.833]	[−51.401, 92.546]	[−2.464, 6.334]	[−45.658, 111.753]
Alliance$_{t-1}$	0.019	0.186	0.037	0.458
	[−0.051, 0.089]	[−1.274, 1.194]	[−0.031, 0.105]	[−0.853, 1.449]
US/USSR CINC Ratio$_{t-1}$	−0.031	−0.528	−0.035	−0.634
	[−0.160, 0.098]	[−3.052, 1.663]	[−0.163, 0.093]	[−3.244, 1.386]
Change in US Mil. Exp.$_{t-1}$	0.058**	0.950***	0.050*	0.824*
	[0.004, 0.111]	[0.103, 2.465]	[−0.003, 0.103]	[0.004, 2.087]
Constant	0.122		0.035	
	[−0.052, 0.296]		[−0.146, 0.216]	
Observations	776		776	
R^2	0.924		0.924	

Note: The dependent variable in both models is military expenditures as percentage of GDP. The 95% confidence intervals for the coefficients are calculated with panel-corrected standard errors (adjusted for panel-specific AR1 processes). The 95% confidence intervals for the long-term effects are calculated with Clarify (King, Tomz, and Wittenberg 2000). ***p < 0.01, **p < 0.05, *p < 0.1

position. This positive estimate is statistically significant in the central portion of this figure where most of the values of right-left position were observed, indicating that increased conflict involvement does lead to increased defense spending. But this relationship is not influenced by government ideology. If we stopped with this model, we

would conclude that government ideology had little if any impact on defense spending. From Figures 3 and 4, however, we can see that this is clearly not the case.

When we move to a two-dimensional model of the influence of government ideology on defense spending, we see that there are significant effects of ideology in

FIGURE 2 Estimated Contingent Effects of Government Right-Left Position and Conflict Involvement on Defense Spending
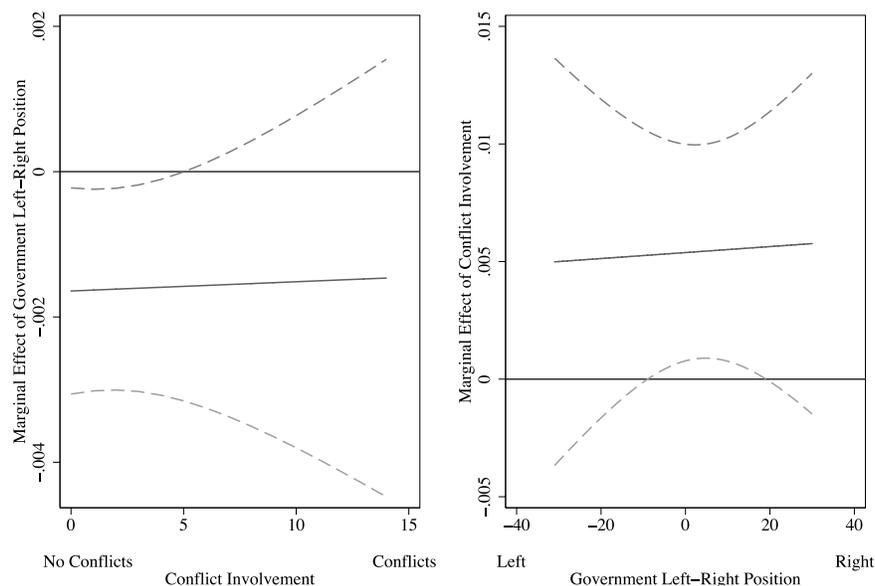
Dashed lines represent 90% confidence intervals

FIGURE 3 Estimated Contingent Effects of Government Welfare Position and Conflict Involvement on Defense Spending
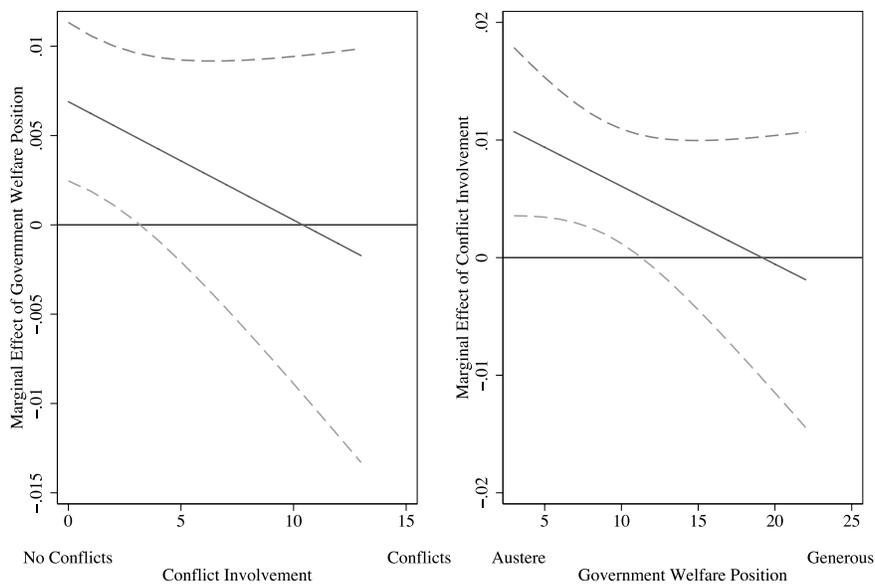

Dashed lines represent 90% confidence intervals

combination with conflict involvement. The left panel in Figure 3 indicates that the impact of a government's welfare position on defense spending is statistically significant and positive when there is no or little conflict involvement. As conflict involvement increases, however, this effect declines and becomes statistically insignificant. The right panel in Figure 3 indicates that conflict involvement has a statistically significant positive effect on

FIGURE 4 Estimated Contingent Effects of Government
International Position and Conflict Involvement
on Defense Spending

No Conflicts   Conflicts   Dove   Hawk

Conflict Involvement   Government International Position

Dashed lines represent 90% confidence intervals
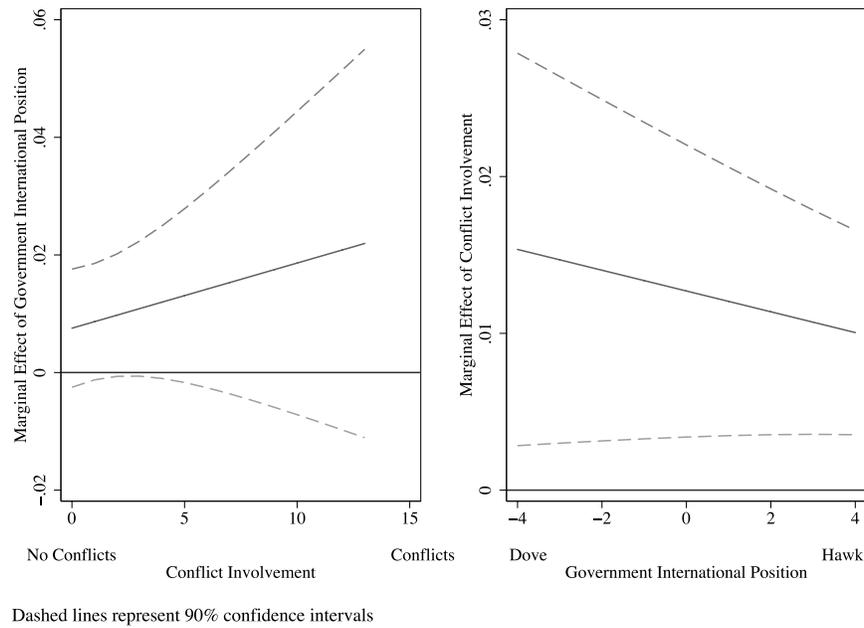
defense spending for governments that favor more austere welfare policies but that this effect declines in magnitude and becomes statistically insignificant for governments that favor more generous welfare policies. These results are consistent with our expectation that governments favoring more generous welfare policies will use military spending as another means for achieving their welfare-related goals. When there is conflict, they can back away from increased defense commitments and still get what they want because of the short-term economic stimulus of conflict. In contrast, holding everything else constant, governments favoring more austere welfare policies will only increase military spending in response to conflict involvement.

Figure 4 isolates the estimated effects of government international position and conflict involvement across values of each other. From the left panel in Figure 4, we can see that the effect of an increase in government hawkishness has the expected positive effect on defense spending. The confidence bounds for this result indicate that although it is in the expected positive direction, it is on the borderline in terms of conventionally accepted levels of statistical significance. The right panel in Figure 4 shows that, holding all else constant, the effect of increased conflict involvement on defense spending is positive and statistically significant across the full range of government international positions.

Figures 2, 3, and 4 are helpful for identifying the direction and statistical significance for the contingent effects of individual variables that have been included in interactive terms. But in order to better understand the substantive nature of these estimated relationships, we need to look at the impact of our two dimensions of government ideology across multiple years of defense spending while varying the level of conflict involvement. To do this, we have developed a series of dynamic simulations.

The presence of a lagged dependent variable on the right-hand side of our models means that the regularly reported OLS coefficients, such as those depicted in Figures 2, 3, and 4, are the estimated effects of a one-unit increase in an independent variable on the change in the dependent variable between time t and time $t + 1$. This also means that each independent variable has an additional long-term effect (for an excellent discussion of these and other dynamic modeling issues, see DeBoef and Keele 2008). The point estimate for the long-term effect of a one-unit shift in an independent variable (X) is calculated as follows:

$$LTE_X = \frac{\hat{\beta}_X}{1 - \hat{\phi}}$$

where $\hat{\beta}_X$ is the parameter estimate for the independent variable of interest and $\hat{\phi}$ is the parameter estimate for the lagged dependent variable. In order to make sense

FIGURE 5 **Predicted Defense Spending by Four Government Types
over 40 Years of Peace**
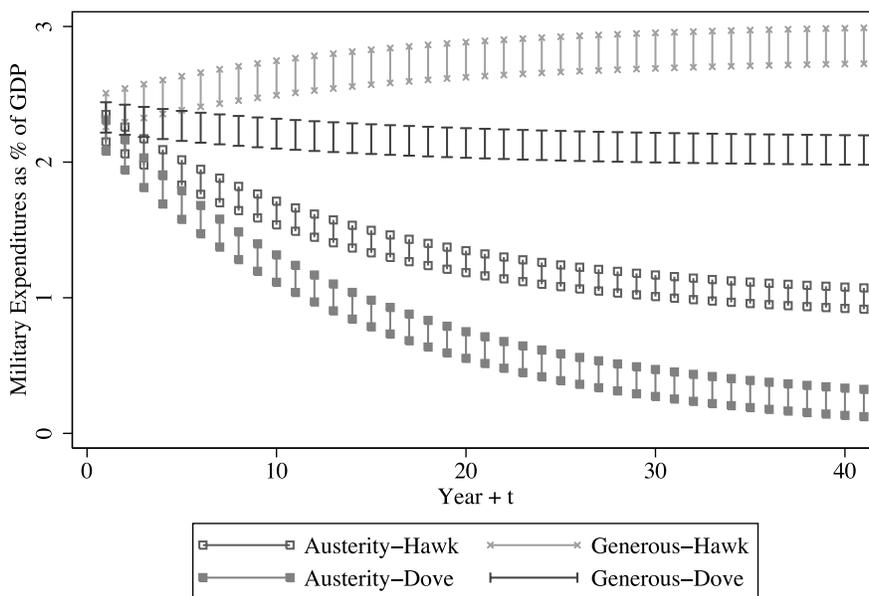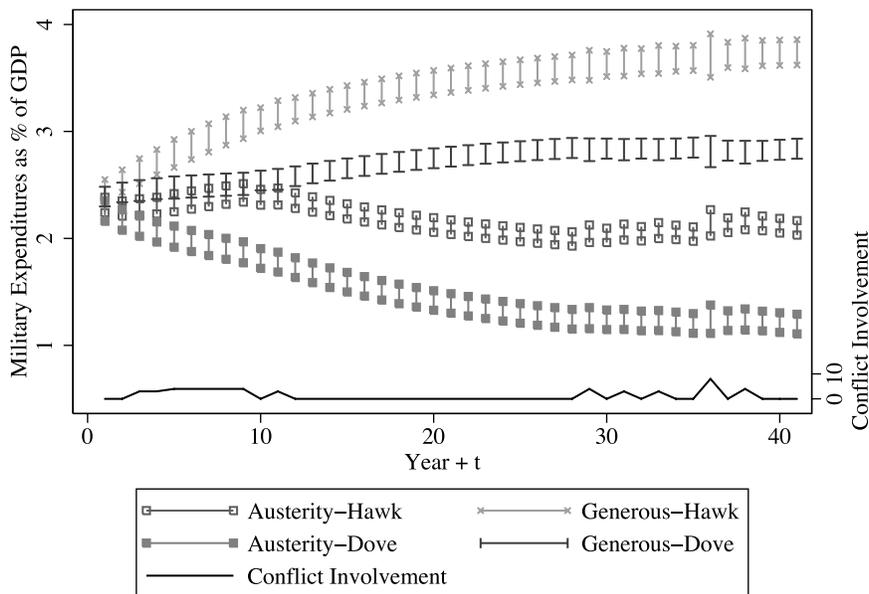

Note: Bars depict 95% confidence intervals.

of all of these complications of interpretation, we conducted a series of dynamic simulations using the Clarify program (King, Tomz, and Wittenberg 2000). In these simulations, we start defense spending set at the sample mean of 2.4% of GDP and then follow the predictions of how it would change for four different government types across different scenarios in terms of international conflict involvement. Across these scenarios, we plot the 95% confidence intervals for our point estimates of defense spending. Note that there are at least three different ways to assess statistical significance in such a figure. The first is that we can see if each of the 95% confidence intervals includes the starting point of 2.4%. If they do not, then there has been a statistically significant change from the start of the scenario. The second way that we can assess statistical significance is to compare pairs of confidence intervals for the same government type across points in time to see if they are statistically significant. And the third, and perhaps most interesting, comparison is between pairs of different government types at the same point in time.

Figure 5 presents a dynamic simulation throughout a 40-year period without international conflict. We set conflict involvement to zero and held constant at their mean or modal values (for continuous and dichotomous variables, respectively) all variables other than government positions. The different confidence intervals displayed in

this figure reflect government positions held constant at the four different combinations of the 5% and 95% ends of the distributions of government welfare and international positions (displayed in Figure 1). From this simulation, it is clear that in times of relative international tranquility, governmental welfare concerns dominate positions on international peace. Welfare-generous governments, both hawks and doves, gradually spend more on the military while austerity governments, regardless of their hawk-dove status, spend less. These differences are statistically distinguishable from each other early in the time period and grow larger across this period of peaceful international relations. Throughout this period, holding welfare positions constant, hawks do spend more on the military than doves, with these differences being statistically significant early on in the simulation.

In Figure 6, we present a dynamic simulation for our four governmental archetypes with some conflict involvement. We based this simulation on the experiences of Sweden over the period from 1950 to 1989. On the bottom of this figure, we depict the over-time profile of conflict that defines this simulation. A comparison of Figures 5 and 6 is instructive, showing that even a relatively small amount of conflict involvement substantially changes the military spending patterns across government archetypes. At the beginning of the simulated period, the generous-hawk and austerity-dove governments

FIGURE 6 **Predicted Defense Spending by Four Government Types over 40 Years of Swedish Conflict Involvement**
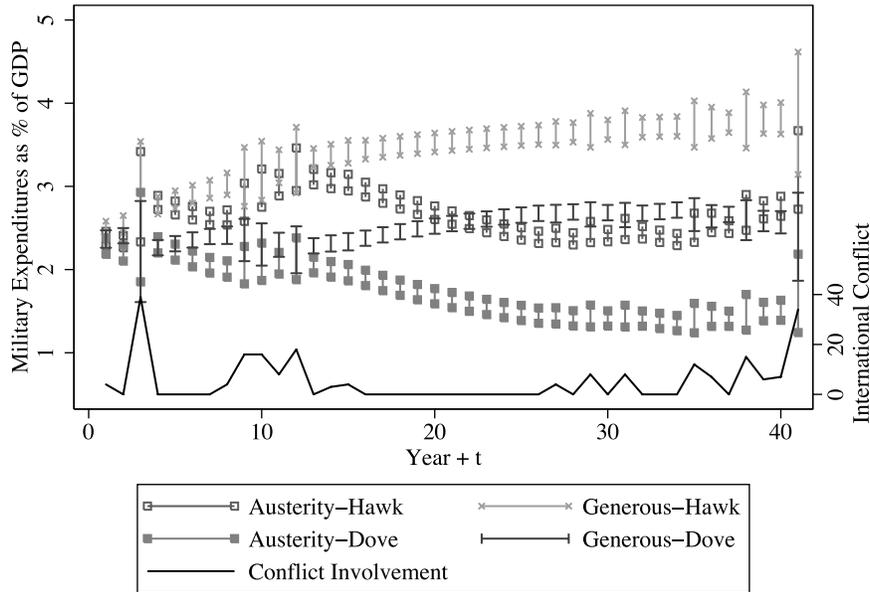

Note: Bars depict 95% confidence intervals.

separate quickly from each other as they did in the peaceful simulation depicted in Figure 5. The main difference between the two simulations is seen in the comparison of the military spending patterns by the generous-dove and austerity-hawk governments. The minor conflicts in the third and sixth years of the simulation are sufficient to keep these two governments from separating. During the period of relative peace between the sixth and thirty-fifth years of the simulation, the difference between these two archetypes becomes statistically significant, with the generous-dove outspending the austerity-hawk. The ensuing period of three years with minor conflicts drives the austerity-hawk's spending levels back up toward those of the generous-dove.

To see how these dynamics play out over a period characterized by greater conflict involvement, we conducted a simulation based on the experiences of France over the period from 1950 to 1989. We can see from the bottom of Figure 7 that this was a period that began with a major amount of conflict, became relatively tranquil, and then was followed by another moderate outbreak of conflicts. The high level of conflict in the third year of this simulation (with a MIDs composite value equal to 39) has an immediate effect, separating the two hawk governments from the doves as expected. After a few years of peace, the spending rates for generous governments become significantly higher than those of the austerity governments across both the hawk and dove pairs. A series of

conflicts in years eight through twelve bring the hawk and dove pairs back together and increase the spending gap between hawks and doves. In the longer period of peace that follows, the spending gap based on welfare positions reappears and the spending levels of the austerity-hawk and generous-dove approach each other.

The inferences from these three simulations of military spending patterns differ substantially from what we would have concluded had we relied on a one-dimensional ideological measure (see Table 4). When using a left-right scale, government ideology has only a modest impact on military spending, with left governments having a slight tendency to outspend right governments. In addition, there is no interaction between government ideology and conflict involvement in the determination of military spending, because the model lacks a theoretical foundation for such an argument. By specifying government ideology as a two-dimensional concept, we find a more sophisticated pattern to government spending that fits our theoretical expectations. During times of peace, domestic concerns will dominate: governments that favor generous welfare policies will outspend governments with more austere preferences, and hawkish governments will also outspend dovish governments. Involvement in low-level conflicts increases the differences between hawks and doves and mutes the effects of government welfare positions, causing hawks substantially to outspend doves on the military.

FIGURE 7 **Predicted Defense Spending by Four Government Types over 40 Years of French Conflict Involvement**

Note: Bars depict 95% confidence intervals.

Influences on military spending come from both domestic and international pressures, but previous theories have ignored their interactive influence on government decisions. Ultimately, this has limited these theories' abilities to explain military spending patterns.

Conclusions and Future Possibilities

In this article, we have advanced and found considerable support for a theory about the influence of government ideology on military spending that takes into account evidence that "guns yield butter" is a more accurate description of budgetary reality than "guns versus butter." But unlike previous research that finds a "guns yield butter" relationship, we theorize beyond the domestic policy situation. Both domestic and international pressures influence government policy decisions, but previous theories have ignored this possibility, ultimately limiting their ability to explain patterns in government policy. Once we incorporate this combination of factors, it becomes clear that a simple left-right conceptualization of government ideology is problematic. While right governments may be more hawkish and thus inclined to spend more on the military, left-leaning governments that see the opportunity to use military spending as welfare policy in disguise will also raise military spending. Unless we separate governments'

ideological preferences into welfare and international positions, we can not develop an accurate understanding of the influence of ideology on military spending. The need to consider government ideology on two separate dimensions becomes even more critical when we consider the strategic opportunities presented by low-level international conflicts. Hawkish governments can use such conflicts to justify further allocations of national resources to the military, while governments that favor more generous welfare policies may use the short-run stimulus effects of such conflicts to pull back from increases in military spending.

Most studies of military spending have focused exclusively on superpowers, but by definition, there can only be a handful of superpower nations at any point in time. Although studies of superpower behavior are important, they ignore the vast majority of nations. In this article, we have focused on non-superpower democracies in the post-WWII era in order to gain maximum leverage on the influence of politics on military spending. Because these nations make decisions about their military spending with the tacit understanding that the United States will protect them in any conflict that threatens their national borders (Palmer 1990), we have not been able to analyze the behavior of states whose existence was fundamentally threatened. Under these circumstances, our evidence suggests that the influence domestic factors have on military spending may be removed completely.

In general, the findings in this article offer a word of caution to researchers studying the impact of government ideology on policymaking. Government ideology is multidimensional. While left-right politics is a reasonable place to start, there are often important political nuances that this one-dimensional conceptualization glosses over. The fit between ideology and policy is seldom straightforward, so it is crucial to think through all of the possible costs and benefits that may result from a particular policy and how government ideology might influence them.

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