

## ARMS, ALLIANCES, AND SUCCESS IN MILITARIZED DISPUTES AND WARS, 1816–1992

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From antiquity to modernity, military capabilities have been deemed a vital asset to ensure success in armed conflict. Furthermore, it has been argued that success in armed conflict may not only enhance a state's international security, reputation, and bargaining leverage but also increase its leaders' chances of retaining domestic political control (Bueno de Mesquita and Siverson 1995). Reflecting this line of reasoning, states have devoted substantial human and material resources to the buildup and maintenance of national military capabilities. Given the costs of providing for military preparedness, to what extent do national military capabilities benefit states in terms of increased success in armed conflict? As recently as 1989, the withdrawal of the last Soviet troops from Afghan territory reminded us that not even the vast military capabilities of a superpower like the Soviet Union guarantee success in war against a small state like Afghanistan.

One of the best early quantitative empirical investigations of the extent to which capabilities and military allocations affect outcomes of interstate armed conflict is a 1983 article by Frank W. Wayman, J. David Singer, and Gary Goertz. Considering original parties and entire coalitions on the initiating and target sides in almost 70 wars and about 100 militarized disputes between major powers from 1816 to 1976, the study correlates armed conflict success with a variety of capability and military allocation indicators. As the three investigators find, success in wars and militarized disputes is (1) mostly a function of an advantage in industrial rather than in military or demographic capabilities and (2) predominantly more likely with military underallocations than overall-

locations. Out of eighteen relations between success in wars and militarized disputes on the one hand and measures of military capabilities and military allocations on the other, eight are statistically insignificant. In brief, contrary to what one might expect, military capabilities are far from a robust guarantee of success in armed conflict.

A critical shortcoming of the study by Wayman, Singer, and Goertz is that it does not take into account that states may rely on some mix of both national and allied<sup>1</sup> military capabilities to ensure success in militarized disputes and wars. It is quite possible that national military capabilities by themselves have a different impact on armed conflict success than national military capabilities considered either in combination with or relative to allied military capabilities.

According to the realist approach to international relations, both armaments and alliances are the most crucial means by which states create, preserve, or reconstruct a balance of power to protect their vital security interests (Morgenthau 1967). A clear example of this point is given by the United States in its Cold War standoff against the Soviet Union. From 1946 through 1990, the United States relied on average not only on 22.5 percent of the global system's national military capabilities but also on 18.4 percent of the global system's military capabilities held by an average of about thirty-eight U.S. allies.<sup>2</sup> It is also important to note that one decade after the end of the Cold War, Condoleezza Rice (2000, 46–47), before becoming National Security Advisor, mentions two key priorities of U.S. foreign policy that focus on the U.S. military and relationships with allies. One priority is “to ensure that America's military can deter war, project power, and fight in defense of its interests if deterrence fails.” Another priority is “to renew strong and intimate relationships with allies who share American values and can thus share the burden of promoting peace, prosperity, and freedom.”

Assuming that armed conflict involvement and success depend on some combination of national and allied military capabilities, this study extends the work of Wayman, Singer, and Goertz by addressing two fundamental questions. First, to what extent are states with a greater reliance on their own armaments rather than on allies more or less likely to be involved in militarized disputes and wars than states relying on allies rather than on their own armaments? Second, to what extent are states with a greater reliance on their own armaments rather than on allies more or less likely to succeed in militarized disputes and wars than states relying on allies rather than on their own armaments?

In order to generate empirical answers to these questions, I first review some of the prior research on the substitutability of arms and alliances. After this review, I present some theoretical arguments and

formulate the hypotheses to be tested. Subsequently, I develop my inquiry's research design. Next, I report and discuss the results from Heckman probit analysis. Finally, I conclude this investigation with a brief summary and evaluation of its findings.

#### SUBSTITUTABILITY OF ARMS AND ALLIANCES

Introducing the concept of substitutability in foreign policy, Most and Starr (1989) argue that foreign policy leaders or decision makers have different means of responding to some particular international concern. Hence, "confronted with some problem or subjected to some stimulus," decision makers "could, *under at least certain conditions, substitute one such means for another,*" which suggests that "*similar* factors could lead to *distinct* concrete or empirical foreign policy responses" (102).

So far, the concept of substitutability in foreign policy has been most notably referred to in studies dealing with trade-offs between arms and alliances. According to several scholars (e.g., Altfeld 1984; Morrow 1993; Sorokin 1994b), states choose a combination of arms and alliances that is most efficient in terms of the costs and benefits associated with each of the two foreign policy alternatives. While the costs of arms and alliances are usually internal, arms and alliance benefits tend to be external. The internal costs of arms are that they necessitate dealing with domestic political opposition to increases in taxation and conscription required by arms buildups. The internal costs of alliances are that they necessitate dealing with domestic political opposition to certain policy concessions required to placate alliance partners. The external benefits of arms are that they are more reliable than alliances in improving a state's international security environment, although arms buildups generate security more slowly than alliance ties. The external benefits of alliances are that they improve a state's international security environment more quickly than arms buildups, although alliances are less reliable than arms in generating security.

As states seek the most efficient mix of arms and alliances, they are influenced by their utility for security, wealth, and autonomy or freedom of action. An increased utility for security is likely to generate an increased demand for both arms and alliances. It is when states have a greater utility for autonomy than for wealth that they are more likely to rest their security on their own armaments than on promises of allied support. Also, the more resources states can mobilize easily, the faster their progress in military technology, the more they disagree with potential allies, and the lesser their potential allies' military capabilities, the more likely states are to rely on their own arms than on alliances.

### *Arms, Alliances, and Success*

Despite many references to the substitutability of arms and alliances, investigators (e.g., Most and Siverson 1987; Diehl 1994; Morgan and Palmer 2000) do not find any consistent empirical evidence permitting us to generalize that states substitute arms for alliances or alliances for arms. To the contrary, it seems that arms and alliances are often complements rather than substitutes for one another, which has several possible explanations. First, a state may not want to make up for reductions in arms spending by seeking alliances if it is its leadership's intention to reduce military expenditures. Second, it is possible that a state may look for alliances to compensate for unintentional decreases in arms spending but may not find any alliance partners. The rationale here is that reduced military expenditures may render a state unattractive to potential allies due to perceptions that it has problems providing for its own security, let alone the security of alliance partners. Third, substitution or complementary effects of alliances on arms spending depend on alliance types, prevailing defense burdens, and numbers of allies. While nonaggression treaties have a substitution effect on increases in arms spending with high and increasing burdens of military preparedness, multiparty defense pacts have a complementary effect on arms spending increases, most clearly after 1945. Fourth, increases in a state's relative capabilities allow for increases in both arms and alliances. Fifth, a state may rely on increases in both arms and alliances because they help to obtain the same good.

Extending prior research on the substitutability of arms and alliances, this study investigates the impact of arms-alliance substitutability/complementarity on success in military conflict, while also predicting to armed conflict involvement. Specifically, this inquiry examines the extent to which a state's involvement and success in militarized disputes and wars are affected by combinations or trade-offs of arms and alliances, national and allied military capabilities. The focus here is only on military capabilities because I expect foreign policy leaders to have more direct influence over military than industrial or demographic capabilities. There is no consideration of military allocations since their operationalization involves industrial and demographic capability measures together with military capability indicators.

### THEORETICAL ARGUMENTS AND HYPOTHESES

According to most realist and neorealist reasoning (e.g., Morgenthau 1967; Waltz 1979), international anarchy—the absence of a world government with a monopoly over the use of force—compels states to rely on their own efforts to secure their territories and populations against

military assaults. As states seek to provide for their security, they may try to maximize their national capabilities in some combination with capabilities of allies. The aggregation of capabilities is expected to either deter armed aggression or ensure military victory once armed conflict gets under way, while enhancing a state's international reputation (Diehl 1994). Given that increased capabilities—specifically military capabilities—are associated with victory or success in military conflict, they may motivate a state to be involved in armed hostilities. This is so because perceptions of possible success in armed conflict make armed conflict involvement an attractive foreign policy option to improve a state's international reputation and strengthen its leadership's grasp on power against domestic opposition.

In brief, when it comes to national military capabilities by themselves:

**HYPOTHESIS 1.1:** The greater a state's national military capabilities, the more likely it is to (1) be involved and (2) succeed in militarized disputes.

**HYPOTHESIS 1.2:** The greater a state's national military capabilities, the more likely it is to (1) be involved and (2) succeed in wars.

Furthermore, to the extent that national military capabilities are combined with allied military capabilities so that they complement one another:

**HYPOTHESIS 2.1:** The greater a state's combined national and allied military capabilities, the more likely it is to (1) be involved and (2) succeed in militarized disputes.

**HYPOTHESIS 2.2:** The greater a state's combined national and allied military capabilities, the more likely it is to (1) be involved and (2) succeed in wars.

While a state may rely exclusively on allied military capabilities, this tends to be quite rare. Most states most of the time have some minimum of national military capabilities. Hence, I do not formulate any separate theoretical argument and hypothesis about the impact of allied military capabilities on involvement and success in militarized disputes and wars.

According to Bennett (1997), Morrow's (1991) "security-autonomy trade-off" model challenges the "capability aggregation" approach to alliances. As Morrow argues, states may use alliances less to aggregate capabilities but to exchange security, or the ability to preserve the sta-

tus quo, for autonomy, or the opportunity to bring about status quo change. Assuming that autonomy is associated with influence or control over alliance partners, even a security-autonomy trade-off may make a state confident of victory or success in armed hostilities, motivating involvement in military conflict. This is so because influence or control over allies may help a state to ensure that allies do not defect and support an adversary in armed confrontations.

Given that many alliances exist for defensive purposes, their encouragement of states to be involved in armed conflict may not be direct but indirect. The point here is that states in defensive alliances, while counting on allied support against aggressors, may see an opportunity to devote their own resources to military action.

There is some prior evidence that the greater a state's national capabilities, the greater its likelihood of militarized dispute involvement as an original initiator or target (Krause and Singer 1997). Also, the greater a state's national capabilities, the greater the likelihood of its war involvement (Bremer 1980). While a state's national capabilities have no statistically significant impact on its success in militarized disputes (Maoz 1983), their increase raises a state's war success (Reiter and Stam 1998).

It is important to consider arms-alliance trade-offs because national military capabilities differ from allied military capabilities in their restraint of armed conflict involvement as well as of the vigorous and uncompromising pursuit of military success. While initial attempts at increasing national military capabilities may be restrained by domestic political opposition, once a state has raised those capabilities, they are likely to generate domestic political support for their use (Diehl 1994). Hence, once national military capabilities have been raised, their availability and reliability for use in armed conflict can be expected to be 100 percent. Increases in a state's national military capabilities may enhance the clout of its military sector, making it more reliant on coercive diplomacy and military force. This means that a state with increased national military capabilities may have an increased willingness to be involved in military hostilities as well as an increased unwillingness to accept anything short of unconditional military success.

Allied military capabilities differ from national military capabilities in that a state has no direct control over their use. It depends on its allies' national interests and on its ability to shape those interests whether a state will encounter allied support or opposition in the event of armed conflict. As Sabrosky (1980) reports, allies honor their agreements reliably in less than 30 percent of war opportunities. By contrast, when considering the specific obligations mentioned in alliance treaties, Leeds, Long, and Mitchell (2000) find that alliance reliability amounts to 74.5

## *The Scourge of* **WAR**

percent. Still, even this increased reliability figure is clearly below the aforementioned 100 percent reliability of national military capabilities.

Given that national military capabilities are more reliable than military capabilities of allies, the greater a state's national versus allied military capabilities, the more likely it is to achieve military success and, hence, the greater its motivation to be involved in armed hostilities.

In sum, to the extent that national military capabilities are traded off against allied military capabilities so that they substitute for one another:

**HYPOTHESIS 3.1:** The greater a state's national military capabilities relative to its allied military capabilities, the more likely it is to (1) be involved and (2) succeed in militarized disputes.

**HYPOTHESIS 3.2:** The greater a state's national military capabilities relative to its allied military capabilities, the more likely it is to (1) be involved and (2) succeed in wars.

Rousseau et al. (1996) provide evidence that, when controlling for the selection of democracies into international crises, the greater a state's level of democracy, the less likely it is to initiate the use of force and employ more than 1,000 troops against states no matter what their political regimes. Additionally, Reiter and Stam (1998) report that democracies are more likely than states with either autocratic or mixed regimes to win wars, a result that is substantively stronger and statistically more significant for war initiators than for war targets. All these findings suggest that the more democratic a state, the less likely it is to be involved in armed conflict but the more likely it is to achieve military success. Given the line of reasoning here, I control for a state's level of democracy when predicting to its involvement and success in militarized disputes and wars.

In light of the studies by Bueno de Mesquita and Siverson (1995), as well as Reiter and Stam (1998) on democracy, war initiation, and war victory, some states, most notably democracies, may succeed in armed conflict they initiate because they initiate only success-promising armed conflict.<sup>3</sup> Hence, when predicting to a state's militarized dispute and war success, I control for a state's identity as a militarized dispute and war initiator, as opposed to any other participant in militarized disputes and wars.

### RESEARCH DESIGN

In this investigation, I consider all sovereign states, as identified on the basis of the Correlates of War Project's updated list of interstate system

members (Small and Singer 1982), between 1816 and 1992.<sup>4</sup> A state-year is the unit of analysis.

For the empirical analysis in this study, I focus on four outcome variables, three predictor variables, and two control variables.<sup>5</sup> The outcome variables are a state's militarized dispute involvement and militarized dispute success as well as its war involvement and war success. The predictor variables are a state's national military capabilities, combined national and allied military capabilities,<sup>6</sup> as well as its trade-off of national versus allied military capabilities. One of the control variables is a state's level of democracy. When predicting to militarized dispute success, an additional control variable is a state's identity as a militarized dispute initiator. A state's identity as a war initiator is an additional control variable when predicting to war success.

Militarized dispute involvement is the probability that a state is involved in militarized interstate disputes. The measure here is a dichotomy, where 1 indicates that a state is involved in at least one militarized interstate dispute, and 0 means that a state refrains from any militarized interstate dispute involvement.

Militarized dispute success is the probability that a state succeeds in militarized interstate disputes. The measure here is a dichotomy, where 1 indicates that a state achieves victory in at least one militarized interstate dispute, and 0 means that a state does not experience any militarized interstate dispute victory.

War involvement is the probability that a state is involved in interstate wars. The measure here is a dichotomy, where 1 indicates that a state is involved in at least one interstate war, and 0 means that a state refrains from any interstate war involvement.

War success is the probability that a state succeeds in interstate wars. The measure here is a dichotomy, where 1 indicates that a state achieves victory in at least one interstate war, and 0 means that a state does not experience any interstate war victory.

The measurement of a state's militarized dispute involvement and militarized dispute success rests on the Correlates of War Project's militarized interstate dispute data (Jones, Bremer, and Singer 1996). The measurement of a state's war involvement and war success rests on the Correlates of War Project's interstate war data (Small and Singer 1982).

The measure for national military capabilities is a scale that captures a state's percentage share of the global system's military capabilities. Specifically, it captures the average of a state's percentage share of the global system's military personnel and a state's percentage share of the global system's military expenditures.

The measure for combined national and allied military capabilities is



a scale that adds to a state's national military capabilities the sum of percentage shares of the global system's military capabilities held by all of a state's allies. The latter captures the average of the sum of a state's allies' percentage shares of the global system's military personnel and the sum of a state's allies' percentage shares of the global system's military expenditures. Expressing this indicator more formally,  $AAC = NMC + AMC$ , where  $AAC$ ,  $NMC$ , and  $AMC$  stand respectively for arms-alliance complementarity, national military capabilities, and allied military capabilities.

A trade-off of national versus allied military capabilities is measured by the ratio of the difference between a state's national and allied military capabilities over the sum of a state's national and allied military capabilities. Expressing this indicator more formally,  $AAS = (NMC - AMC) / (NMC + AMC)$ , where  $AAS$ ,  $NMC$ , and  $AMC$  stand respectively for arms-alliance substitutability, national military capabilities, and allied military capabilities. The measure of arms-alliance substitutability is a scale that ranges from a minimum of  $-1$  to a maximum of  $1$ . A score of  $-1$  denotes that a state has only allied military capabilities but no national military capabilities, meaning that allied military capabilities perfectly substitute for national military capabilities. A score of  $1$  denotes that a state has only national military capabilities but no allied military capabilities, meaning that national military capabilities perfectly substitute for allied military capabilities. A score of  $0$  denotes that a state has a perfectly balanced mix of both national and allied military capabilities, meaning that national and allied military capabilities do not at all substitute for one another.<sup>7</sup>

For the measurements of a state's national military capabilities, combined national and allied military capabilities, as well as its trade-off of national versus allied military capabilities, I use the Correlates of War Project's data on material capabilities (Singer 1990c). For the measurements of a state's combined national and allied military capabilities as well as its trade-off of national versus allied military capabilities, I also employ the Correlates of War Project's formal alliance data (Small and Singer 1990).<sup>8</sup>

A state's level of democracy is measured by an index of net democracy based on the Polity98 data set's indicators of democracy and autocracy. Here a score of  $0$  shows respectively minimum democracy and minimum autocracy while a score of  $10$  reveals respectively maximum democracy and maximum autocracy (Jagers and Gurr 1995; Gurr and Jagers 2000). By subtracting autocracy scores from democracy scores and adding the difference to  $10$ , I generate a net-democracy scale ranging from a minimum of  $0$  to a maximum of  $20$ . A score of  $0$  denotes

maximum autocracy or minimum democracy while a score of 20 denotes maximum democracy or minimum autocracy.

Identity as a militarized dispute initiator distinguishes a militarized dispute initiator from any other militarized dispute participant. It is measured by a dichotomy, where 1 indicates that a state initiated a militarized dispute, and 0 means that a state was either a militarized dispute target or joined a militarized dispute on the side of either another initiator or another target.

Identity as a war initiator distinguishes a war initiator from any other war participant. It is measured by a dichotomy, where 1 indicates that a state initiated a war, and 0 means that a state was either a war target or joined a war on the side of either another initiator or another target.

The measurement of a state's identity as a militarized dispute initiator, like the measurements of the outcome variables concerning militarized disputes, rests on the Correlates of War Project's militarized interstate dispute data (Jones, Bremer, and Singer 1996). The measurement of a state's identity as a war initiator, like the measurements of the outcome variables concerning wars, rests on the Correlates of War Project's interstate war data (Small and Singer 1982).

Since the measures for all outcome variables are dichotomous, probit regression analysis is an appropriate statistical estimation technique (Hanushek and Jackson 1977; Aldrich and Nelson 1984; Greene 2003). A critical issue in this investigation is that a state can only experience armed conflict success if it is involved in armed conflict to begin with. Put differently, armed conflict involvement is a necessary condition for armed conflict success. Furthermore, since some states may succeed in armed conflict because they select involvement in only success-promising armed conflict, attempts at predicting to success in militarized disputes and wars may run into selection bias (Achen 1986; Reed 2000). Selection bias can occur if unobserved variables that affect armed conflict involvement also affect armed conflict success, which means that there is a relationship between the unobserved covariates of involvement and success. Since such related variables are not observed, they are consigned to the error terms of the models predicting respectively to involvement and success in armed conflict. As a consequence, we need to account for the correlation between the error terms pertaining to the outcome variables in a two-stage armed conflict involvement-success selection process.

In order to control for selection bias due to any selection effect of militarized dispute/war involvement on militarized dispute/war success, I test hypotheses 1.1(1) through 3.2(2) with censored probit by relying

on Heckman probit analysis (Heckman 1979).<sup>9</sup> Censored probit estimates jointly the probabilities of (1) militarized dispute/war involvement and (2) militarized dispute/war success, with militarized dispute/war involvement coded 1 if a state is involved in a militarized interstate dispute/interstate war and 0 if it is not. Militarized dispute/war success, however, is coded only if militarized dispute/war involvement is coded 1, which indicates that militarized dispute/war involvement is a necessary condition for success in militarized disputes/wars. As Lemke and Regan (this vol.) would put it in their discussion of censored probit, involvement in militarized disputes/wars provides an opportunity for militarized dispute/war success. Overall, there are three possible outcomes: First, a state is not involved in a militarized dispute/war. Second, a state is involved in a militarized dispute/war but does not experience militarized dispute/war success. Third, a state is involved and succeeds in a militarized dispute/war.

By using censored probit, I estimate jointly two types of effects of national military capabilities, combined national and allied military capabilities, and a trade-off of national versus allied military capabilities. First are the predictors' effects on militarized dispute/war involvement as a condition for militarized dispute/war success. Second are the predictors' effects on militarized dispute/war success itself. Furthermore, by employing censored probit, I estimate a statistical link, rho, to control for selection bias due to any selection effect based on inferences about the correlation between the error terms of (1) militarized dispute/war involvement and (2) militarized dispute/war success.

When looking at militarized disputes, I present a combined model including a selection model predicting to militarized dispute involvement *as well as* an outcome model predicting to success in militarized disputes. When looking at wars, I present a combined model including a selection model predicting to war involvement *as well as* an outcome model predicting to success in wars.

In order to control for time dependence, I apply the Beck, Katz, and Tucker (1998) method to all the models in this inquiry. Specifically, the selection models predicting to militarized dispute and war involvement include respectively (1) a time variable for prior state-years with no militarized dispute involvement and (2) a time variable for prior state-years with no war involvement, as well as three splines based on each time variable. The outcome models predicting to militarized dispute and war success include respectively (1) a time variable for prior state-years with no militarized dispute success and (2) a time variable for prior state-years with no war success, as well as three splines based on each time variable.<sup>10</sup>

## RESULTS

Table 1 presents the results of a multivariate Heckman probit analysis of militarized dispute success, with sample selection by militarized dispute involvement. This censored probit estimates jointly a militarized dispute involvement (selection) model and a militarized dispute success (outcome) model.

As for the militarized dispute involvement model, we find that a state's national military capabilities by themselves have a statistically significant and substantively by far the strongest impact on its militarized dispute involvement. A change in a state's national military capabilities from a minimum of 0 to a maximum of 0.43 increases its probability of militarized dispute involvement by 38.0 percent, which supports hypothesis 1.1(1). Neither a state's combined national and allied military capabilities nor its national military capabilities relative to its allied military capabilities have any statistically significant effect on its militarized dispute involvement. This fails to support hypotheses 2.1(1) and 3.1(1). Similarly, a state's level of democracy has no statistically significant impact on its involvement in militarized disputes.

In absolute substantive terms, the impact of a state's national military capabilities on its militarized dispute involvement is over nine times greater than the impact of any other variable considered in the militarized dispute involvement model. This suggests that a state's involvement in militarized disputes is influenced predominantly—almost exclusively—by its own armaments rather than by its allies or its level of democratic governance. One may speculate that an increase in a state's national military capabilities increases its willingness to be involved in militarized disputes by enhancing the clout of its military sector and, hence, making it more reliant on coercive diplomacy and military force.

As for the militarized dispute success model, we find that a state's national military capabilities by themselves have no statistically significant impact on its militarized dispute success, which fails to support hypothesis 1.1(2). Although this finding seems quite counterintuitive, it is important to note at this point that every year from the beginning to the end of a state's militarized dispute involvement is considered a state-year with no experience of any militarized dispute success. To the extent that an increase in national military capabilities may get a state to prolong its militarized dispute involvement, we would observe additional state-years that are not considered successful. Such observations may cancel out any positive effects of a state's national military capabilities on its success in militarized disputes. Hence, it would not be all

**TABLE 1. Heckman Probit Analysis of Militarized Dispute Success, with Sample Selection by Militarized Dispute Involvement**

Predictors of Militarized Dispute Involvement	Coefficient (Standard Error)	Range of Variable	% Change in Probability of Militarized Dispute Involvement (Baseline: 63.7)
National military capabilities	+4.6743 (1.0937)***	0.00–0.43	+38.0
Combined national and allied military capabilities	+0.1147 (0.1923)	0.00–0.92	+3.9
National versus allied military capabilities	-0.0425 (0.0316)	-1–1	-3.2
Level of democracy	+0.0031 (0.0039)	0–20	+2.4
Predictors of Militarized Dispute Success	Coefficient (Standard Error)	Range of Variable	% Change in Probability of Militarized Dispute Success (Baseline: 12.8)
National military capabilities	+0.5300 (0.9472)	0.00–0.43	+5.3
Combined national and allied military capabilities	+1.1321 (0.3043)***	0.00–0.92	+30.0
National versus allied military capabilities	+0.2053 (0.0702)**	-1–1	+8.7
Level of democracy	+0.0134 (0.0046)**	0–20	+5.7
Militarized dispute initiator	+0.2032 (0.0865)**	0–1	+3.8
Constant, militarized dispute involvement model	+0.2354 (0.0543)***		
Constant, militarized dispute success model	-1.3907 (0.1731)***		
Rho (selection effect)	-0.2488 (0.0857)**		
LL, militarized dispute involvement model	-4948.5388 (-6420.7884)		
LL, militarized dispute success model	-766.8314 (-829.5980)		
Number of observations (censored/uncensored)	10,123 (6,781/3,342)		
$\chi^2$	89.52***		

*Note:* Models include a variable for prior state-years with no militarized dispute involvement and a variable for prior state-years with no militarized dispute success, as well as three splines based on each time variable, to control for time dependence, using the Beck et al. (1998) method (estimates omitted). Standard errors (in parentheses) are heteroskedastic-robust and account for clustering of observations by state. All significance levels (*p*-values) are based on two-tailed tests, with exceptions of one-tailed tests for predictors that rest on specific directional hypotheses and have coefficients in expected directions. LL is converged log likelihood. Initial log likelihood (in parentheses) is shown for null model. Marginal impacts are computed with predicted values (coefficients). The values of selected predictors are changed while holding all others constant at their means or modes. Each change in position on the cumulative normal distribution underlying a probit model is then translated into a percentage change in the probability of a particular outcome.

\**p* ≤ 0.05; \*\**p* ≤ 0.01; \*\*\**p* ≤ 0.001

that surprising to find that a state's national military capabilities have no statistically significant impact on its militarized dispute success.

Interestingly, the situation is different when allied military capabilities complement national military capabilities. Unlike a state's national military capabilities by themselves, its combined national and allied military capabilities have a statistically significant and substantively by far the strongest impact on its militarized dispute success. A change in a state's combined national and allied military capabilities from a minimum of 0 to a maximum of 0.92 increases its probability of militarized dispute success by 30.0 percent, which supports hypothesis 2.1(2). This suggests that, once a state is involved in a militarized dispute, its likelihood of militarized dispute success is enhanced by an increase in its allied military capabilities complementing its national military capabilities. Here one may speculate that, as a state increasingly complements its own armaments with militarily strong allies, it increases its chance of militarized dispute success by raising the international legitimacy of its position while reducing potential international support for its adversaries.

The impact of a state's trade-off of national versus allied military capabilities on its militarized dispute success is statistically significant but substantively weaker than the impact of its combined national and allied military capabilities. A change in a state's national military capabilities relative to its allied military capabilities from perfect substitution of allied for national military capabilities ( $-1$ ) to perfect substitution of national for allied military capabilities ( $1$ ) increases its probability of militarized dispute success by 8.7 percent, which supports hypothesis 3.1(2). This may be so because the greater a state's national versus allied military capabilities, the greater its influence or control over its allies and the lesser the likelihood that a state's allies will defect and support its adversaries.

Taking into account both combined national and allied military capabilities and a trade-off of national versus allied military capabilities, it seems that a state's chance of militarized dispute success is enhanced most significantly under two conditions. First, there is an increase in a state's allied military capabilities complementing its national military capabilities, raising the amount of allied military resources that may eventually be mobilized against adversaries. Second, there is an increase in a state's national military capabilities relative to its allied military capabilities, raising the likelihood that allied military resources will indeed be mobilized against adversaries, not in their support. Although increases in both combined national and allied military capabilities and in a trade-off of national versus allied military capabilities enhance a state's likelihood

of militarized dispute success, the complementary effect is substantively over three times greater than the substitution effect.

The impact of a state's level of democracy on its militarized dispute success is statistically significant but substantively weaker than the impact of a state's trade-off of national versus allied military capabilities. A change in a state's level of democracy from a minimum of 0 to a maximum of 20 increases its probability of militarized dispute success by 5.7 percent. Apparently, once a state is involved in a militarized dispute, the more democratic its political regime, the greater its domestic legitimacy and support, ensuring an increased chance of militarized dispute success.

The impact of a state's identity as a militarized dispute initiator on its militarized dispute success is statistically significant but substantively weaker than the impact of its level of democracy. A state that initiated a militarized dispute tends to be 3.8 percent more successful than a state that was either a militarized dispute target or joined a militarized dispute on the side of either another initiator or another target. Following Bueno de Mesquita and Siverson (1995) as well as Reiter and Stam (1998), one may argue that militarized dispute initiators are successful because they initiate only militarized disputes in which they are likely to succeed.

According to the estimate of the statistical link,  $\rho$ , there is statistically significant selection bias due to some selection effect of militarized dispute involvement on success in militarized disputes. Specifically, there is a statistically significant negative correlation between the error terms of the two outcome variables, meaning that the effects of unobserved variables on involvement in militarized disputes are in the opposite direction compared with their effects on militarized dispute success.

Table 2 presents the results of a multivariate Heckman probit analysis of war success, with sample selection by war involvement. This censored probit estimates jointly a war involvement (selection) model and a war success (outcome) model.

As for the war involvement model, we find that a state's national military capabilities by themselves have no statistically significant impact on its war involvement, which fails to support hypothesis 1.2(1). While a state with relatively larger national military capabilities may have an increased motivation to be involved in wars, a state with relatively lesser national military capabilities may have an increased likelihood of being involved in wars not of its choice. To the extent that both a militarily stronger state and a militarily weaker state may have, for different reasons, an increased chance of involvement in wars, it would not be all that surprising to find that a state's national military capabilities have no statistically significant impact on its war involvement.

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Interestingly, the situation is different when allied military capabilities complement national military capabilities. Unlike a state's national military capabilities by themselves, its combined national and allied military capabilities have a statistically significant and substantively by far the strongest impact on its war involvement. A change in a state's combined

**TABLE 2. Heckman Probit Analysis of War Success, with Sample Selection by War Involvement**

Predictors of War Involvement	Coefficient (Standard Error)	Range of Variable	% Change in Probability of War Involvement (Baseline: 69.4)
National military capabilities	-0.7977 (0.6845)	0.00-0.43	-12.8
Combined national and allied military capabilities	+1.4696 (0.2745)***	0.00-0.92	+33.7
National versus allied military capabilities	+0.2146 (0.0504)***	-1-1	+14.9
Level of democracy	-0.0072 (0.0051)	0-20	-5.1

  

Predictors of War Success	Coefficient (Standard Error)	Range of Variable	% Change in Probability of War Success (Baseline: 21.8)
National military capabilities	-0.9648 (0.9859)	0.00-0.43	-10.6
Combined national and allied military capabilities	+1.4150 (0.5794)**	0.00-0.92	+44.8
National versus allied military capabilities	+0.1677 (0.1375)	-1-1	+9.8
Level of democracy	+0.0048 (0.0081)	0-20	+2.8
War initiator	+0.6652 (0.1663)***	0-1	+23.7
Constant, war involvement model		+0.3820 (0.0892)***	
Constant, war success model		-1.3934 (0.3950)***	
Rho (selection effect)		+0.3102 (0.1104)**	
LL, war involvement model		-1010.1826 (-1496.0800)	
LL, war success model		-262.2539 (-278.1988)	
Number of observations (censored/uncensored)		3,342 (2,791/551)	
$\chi^2$		28.20***	

*Note:* Models include a variable for prior state-years with no war involvement and a variable for prior state-years with no war success, as well as three splines based on each time variable, to control for time dependence, using the Beck et al. (1998) method (estimates omitted). Standard errors (in parentheses) are heteroskedastic-robust and account for clustering of observations by state. All significance levels (*p*-values) are based on two-tailed tests, with exceptions of one-tailed tests for predictors that rest on specific directional hypotheses and have coefficients in expected directions. LL is converged log likelihood. Initial log likelihood (in parentheses) is shown for null model. Marginal impacts are computed with predicted values (coefficients). The values of selected predictors are changed while holding all others constant at their means or modes. Each change in position on the cumulative normal distribution underlying a probit model is then translated into a percentage change in the probability of a particular outcome.

\**p* ≤ 0.05; \*\**p* ≤ 0.01; \*\*\**p* ≤ 0.001



national and allied military capabilities from a minimum of 0 to a maximum of 0.92 increases its probability of war involvement by 33.7 percent, which supports hypothesis 2.2(1). This suggests that a state's likelihood of war involvement is enhanced by an increase in its allied military capabilities complementing its national military capabilities. As a state increasingly complements its own arms with militarily strong allies, it may become more motivated to be involved in wars due to expectations of increased allied military assistance in confrontations with adversaries.

The impact of a state's trade-off of national versus allied military capabilities on its war involvement is statistically significant but substantively weaker than the impact of its combined national and allied military capabilities. A change in a state's national military capabilities relative to its allied military capabilities from perfect substitution of allied for national military capabilities (-1) to perfect substitution of national for allied military capabilities (1) increases its probability of war involvement by 14.9 percent, which supports hypothesis 3.2(1). This may be so because the greater a state's national versus allied military capabilities, the greater its influence or control over its allies and the lesser the likelihood that a state's allies will defect and support its adversaries. Taking this argument a step further, the lesser the likelihood that a state's allies will defect and support its adversaries, the greater a state's expectations of its allies' loyalty and, hence, the greater a state's motivation to be involved in wars.

Taking into account both combined national and allied military capabilities and a trade-off of national versus allied military capabilities, it seems that a state's chance of war involvement is enhanced most significantly under two conditions. First, there is an increase in a state's allied military capabilities complementing its national military capabilities, raising the amount of allied military resources that may eventually be mobilized against adversaries. Second, there is an increase in a state's national military capabilities relative to its allied military capabilities, raising the likelihood that allied military resources will indeed be mobilized against adversaries, not in their support. Although increases in both combined national and allied military capabilities and in a trade-off of national versus allied military capabilities enhance a state's likelihood of war involvement, the complementary effect is substantively over two times greater than the substitution effect.

A state's level of democracy has no statistically significant impact on its war involvement. This suggests that a state's war involvement is influenced more critically by its international relationships with allies than by its level of domestic democratic governance.

As for the war success model, we find that a state's national military

capabilities by themselves have no statistically significant impact on its war success, which fails to support hypothesis 1.2(2). Although this finding, like the one concerning militarized dispute success, seems quite counterintuitive, it is important to note at this point that every year from the beginning to the end of a state's war involvement is considered a state-year with no experience of any war success. If there were situations in which an increase in national military capabilities might get a state to prolong its war involvement, we would observe additional state-years that are not considered successful. Such observations may cancel out any positive effects of a state's national military capabilities on its success in wars. Hence, it would not be all that surprising to find that a state's national military capabilities have no statistically significant impact on its war success.

Interestingly, the situation is different when allied military capabilities complement national military capabilities. Unlike a state's national military capabilities by themselves, its combined national and allied military capabilities have a statistically significant and substantively by far the strongest impact on its war success. A change in a state's combined national and allied military capabilities from a minimum of 0 to a maximum of 0.92 increases its probability of war success by 44.8 percent, which supports hypothesis 2.2(2). This suggests that, once a state is involved in a war, its likelihood of war success is enhanced by an increase in its allied military capabilities complementing its national military capabilities. Here one may speculate that, as a state increasingly complements its own armaments with militarily strong allies, it increases its chance of war success by raising its amount of potential allied military assistance while reducing potential armed support from allies for its adversaries.

A state's trade-off of national versus allied military capabilities has no statistically significant impact on its war success, which fails to support hypothesis 3.2(2). Once a war is under way, the stakes may be so high that a state's allies may provide military assistance, or at least refrain from defection and support for its adversaries, no matter what the extent of military capability superiority, influence, or control that a state has over its allies. Hence, it may not be all that surprising to find that a state's war success is statistically not significantly affected by its trade-off of national versus allied military capabilities.

A state's level of democracy has no statistically significant impact on its war success. This suggests that a state's war success is influenced more critically by its international allied military capabilities complementing its national military capabilities than by its level of domestic democratic governance.

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The impact of a state's identity as a war initiator on its war success is statistically significant but substantively weaker than the impact of its combined national and allied military capabilities. A state that initiated a war tends to be 23.7 percent more successful than a state that was either a war target or joined a war on the side of either another initiator or another target.<sup>11</sup> Following again Bueno de Mesquita and Siverson (1995) as well as Reiter and Stam (1998), one may argue that war initiators are successful because they initiate only wars in which they are likely to succeed.

According to the estimate of the statistical link,  $\rho$ , there is statistically significant selection bias due to some selection effect of war involvement on success in wars. Specifically, there is a statistically significant positive correlation between the error terms of the two outcome variables, meaning that the effects of unobserved variables on involvement in wars are in the same direction compared with their effects on war success.

### CONCLUSIONS

Contrary to what one might expect, military capabilities are far from a robust guarantee of success in armed conflict. Success in wars and militarized disputes is not only mostly a function of an advantage in industrial rather than in military or demographic capabilities but also predominantly more likely with military underallocations than overallocations. Close to half of all relations between militarized dispute and war success on the one hand and measures of military capabilities and military allocations on the other are statistically insignificant.

This chapter extended the work of Wayman, Singer, and Goertz (1983) by taking into account that states may rely on some mix of both national and allied military capabilities to ensure success in militarized disputes and wars. Given the concept of substitutability in foreign policy (Most and Starr 1989), this study examined the extent to which a state's armed conflict involvement and success are affected by the complementarity or substitutability of its national and allied military capabilities. Put differently, this study examined the extent to which a state's combinations or trade-offs of national and allied military capabilities affect its involvement and success in militarized disputes and wars.

Focusing on all state-years between 1816 and 1992, this inquiry found that an increase in a state's national military capabilities significantly raises its likelihood of involvement in militarized disputes. By contrast, a state's war involvement is statistically not significantly af-

fectured by its national military capabilities. Tentative explanations for these findings were provided in the previous section on results.

Increases in a state's combined national and allied military capabilities and in a state's trade-off of national versus allied military capabilities significantly raise its likelihood of war involvement but have no statistically significant effect on its involvement in militarized disputes. This suggests that expectations of allied military support are far more critical in influencing war than militarized dispute involvement.

A state's national military capabilities by themselves have no statistically significant effect on either its militarized dispute or war success. This reinforces the doubt raised by Wayman, Singer, and Goertz about any notion that national military capabilities by themselves are the key to success in armed conflict.

An increase in a state's combined national and allied military capabilities significantly raises both its militarized dispute and war success. In addition to our earlier discussion of results, we may argue that the greater the military capabilities of allies that a state can add to or combine with its national military capabilities, the fewer national military capabilities a state has to invest in the pursuit of success in militarized disputes and wars. This allows a state to keep some national military capabilities in reserve, to be used when a state's allied military capabilities no longer guarantee militarized dispute and war success or when a state's allies become adversaries. At the same time, the greater a state's allied military capabilities, the more likely a state will be abandoned or even opposed by its allies, and the greater a state's need to demonstrate resolve to its alliance partners. By extension, the greater its need to demonstrate resolve to its allies, the greater a state's likelihood of taking a hard line with respect to adversaries and rejecting anything short of unconditional militarized dispute and war success.<sup>12</sup>

The greater a state's national military capabilities relative to its allied military capabilities, the significantly greater its likelihood of success in militarized disputes. This may be largely due to the impact of national and allied military capabilities on alliance politics. As Snyder (1984, 1997) points out, alliance politics involves the fear of either "abandonment" or "entrapment" in military interactions. Additionally, if its alliance partners do not support a state, it may punish those allies by subjecting them to some combination of diplomatic, economic, and military coercion. A state's ability to shape its allies' national interests with threats of abandonment or punishment and its chance of reducing allied resistance to entrapment in unwanted armed conflict depend on its mix of national and allied military capabilities. The greater a state's

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national versus allied military capabilities, the greater a state's ability to influence its allies' national interests. The greater a state's national versus allied military capabilities, the more credible a state's threats of abandoning or punishing disloyal allies, and the less likely a state is to encounter allied resistance to entrapment in unwanted armed conflict. By implication, the lesser its allies' resistance, the more likely a state is to succeed in armed conflict, that is, at least in militarized disputes.

When it comes to war, a state's national military capabilities relative to its allied military capabilities have no statistically significant impact on its war success, possibly for reasons that I offered in the previous discussion of results.

It should be noted that the analysis of war involvement and success is based on only those cases where states were involved in militarized disputes. This is admittedly a very crude way of considering the selection of cases examined for war involvement and success from a pool of cases of militarized dispute involvement. Further research still needs to develop integrated selection models to take into account more or less simultaneously selection effects both of militarized dispute involvement on war involvement and of war involvement on war success. In further research, I will also seek to explore the optimal mix of allied military capabilities relative to national military capabilities required for a maximum likelihood of success in armed conflict.

### NOTES

*Author's Note:* I gratefully acknowledge Paul Diehl, Douglas Lemke, J. David Singer, Susumu Suzuki, and two anonymous reviewers for constructive comments and helpful suggestions. I also thank Brian Lai and Dan Reiter for sharing their information on alliances beyond 1984.

1. Although Wayman, Goertz, and Singer deal with coalitions in militarized disputes and wars, coalitions are not necessarily alliances. Unlike coalitions, alliances are based on written, mostly voluntary, formal agreements, treaties, or conventions among states pledging to coordinate their behavior and policies in the contingency of military conflict (Buono de Mesquita and Singer 1973; Ward 1982).

2. The averages reported here in regard to military capabilities and allies are based on the Correlates of War Project's material capabilities and formal alliance data (Singer 1990c; Small and Singer 1990).

3. Gelpi and Griesdorf (2001) make a similar point with respect to democracy, challengers, and success in international crises.

4. The examination begins in 1816 and ends in 1992 because data on *all* variables in this inquiry are available only for the period between 1816 and 1992. As of this writing, the Correlates of War Project is in the process of gen-

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erating data beyond 1992 not only on formal alliances, but also on material capabilities and militarized interstate disputes.

5. In order to test for multicollinearity, I look at the tolerance levels among all the predictor and control variables that are supposed to account for a particular outcome variable. The lower the tolerance level of any predictor or control variable, the more likely that variable can be explained by a linear combination of all other predictor and control variables. A common tolerance threshold is 0.30 (Hanushek and Jackson 1977; Menard 1995). There is no serious multicollinearity problem in any of the following analyses because the tolerance levels of all predictor and control variables are consistently above the 0.30 threshold.

6. Including allied military capabilities as a separate predictor variable, in addition to national military capabilities and combined national and allied military capabilities, results in serious multicollinearity. Hence, I omit allied military capabilities from all empirical analyses.

7. It is important to note that a state may also receive a score of 0 for a perfectly balanced mix of both national and allied military capabilities if it has no national and allied military capabilities at all. Despite this caveat, the bottom line is still that a score of 0 denotes that a state's mix of national and allied military capabilities is perfectly balanced.

8. The Correlates of War Project's formal alliance data officially includes alliances between 1816 and 1984. I extended the alliance data for the years between 1985 and 1992 with the help of Lai and Reiter (2000). The Correlates of War 2 Project is currently updating its formal alliance data. Awaiting the completion of this update, the extended alliance data used in this study are not meant to compete with the new official version of the formal alliance data soon to be released by the Correlates of War 2 Project.

9. Reed (2000) cautions that a two-stage probit analysis according to Heckman, although it yields substantive and statistical results that are similar to the ones generated by a full information maximum likelihood (FIML) censored probit analysis, is inefficient due to heteroskedasticity. Heeding Reed's caution, I report standard errors that are heteroskedastic-robust for each analysis in this investigation.

10. In order to focus on the major predictor and outcome variables in this investigation, I omit from the presentation of results all estimates for the time variables and splines created with the Beck, Katz, and Tucker (1998) method. Despite these omissions, it is important to remember that the time variables for prior state-years with no militarized dispute and war involvement, as well as the corresponding splines, are included in the selection models but not in the outcome models. Hence, the variables affecting militarized dispute and war involvement in the selection models are not identical to the variables affecting militarized dispute and war success in the outcome models. This means, according to Sartori (2002), that the Heckman estimators used in this study are appropriate compared with the new estimator introduced by Sartori (2003).

11. Given the evidence by Reiter and Stam (1998) that democratic war ini-

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tiators are more likely than any other states to achieve war victory, I replaced a state's identity as a war initiator with an interaction term combining a state's identity as a war initiator with its level of democracy. The results corroborate the Reiter-Stam evidence. As for a war initiator, the higher its level of democracy, the significantly more likely it is to experience war success. A change in a war initiator's level of democracy from a minimum of 0 to a maximum of 20 increases its probability of war success by 30.7 percent. As far as any other war participant is concerned, its level of democracy has no statistically significant impact on its likelihood of war success. Substantively, a change in its level of democracy from a minimum of 0 to a maximum of 20 decreases its probability of war success by 9.9 percent. The additional analysis is available from the author upon request.

12. For an excellent study of alliance and adversary games, see Snyder (1997).