Alliance Burden-Sharing in System Polarities

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As we move into the third decade after the end of the Cold War, scholars and commentators continue to ask how newly defined roles of various U.S. allies will correspond to their levels of burden sharing. In order to answer this question, we draw on neorealist and economic models to develop theoretical expectations about the relationship between system polarity and alliance burden sharing. Using the Alliance Treaty and Obligations (ATOP) data to measure alliances, and military expenditures and GDP data to fashion a burden sharing index, we examine the effects of major power and minor power alliances with a system leader under multipolarity, bipolarity, and unipolarity from 1885 to 2001. Consistent with the expectations, allies' burden sharing demonstrates no clear pattern under multipolarity; decreases for U.S. allies and major powers allied with the USSR, but increases for minor powers allied with the USSR during bipolarity; and decreases for minor powers allied with the U.S. while having no effect on major powers allied with the U.S. under the current unipolar system.

Keywords: alliance, burden-sharing, multipolarity, bipolarity, unipolarity, international system, defense spending

Introduction

The end of the Cold War in 1990 was followed by a shift from a bipolar to a unipolar world dominated by the United States, profoundly transforming the nature of international alliance politics. Under unipolarity, great power competitors, or their coalitions, are unlikely to challenge the primacy of the leading state. Thus, for the unipole, the underlying motivation for alignment is not as strong as it is in a bipolar system. Nonetheless, most U.S. alliances, often regarded as a Cold War legacy, continue to operate. Furthermore, the U.S.-centered alliance network has been augmented by the addition of new members following the

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collapse of the Soviet Union. Why and how does the unipole expand its alliances, despite seemingly having a reduced need for them?

We argue that the unipolar security environment alters the nature of burden sharing, thereby reshaping alliance politics. The end of the Cold War decreased traditional military functions of alliances and converted burden sharing to more widely shared contributions for a broader scope of public goods such as financing the North Atlantic Treaty Organization (NATO) enlargement, economically aiding developing countries, and supporting multinational peacekeeping operations.[1] However, this shift in alliance burdens tends to intensify intra–alliance tensions, particularly due to the difficulties in assessing its fairness. Additionally, the disappearance of the political fault lines of the Cold War focused attention on ad hoc coalitions and other non-institutional alliances.[2] Also, a strategic shift of the U.S. alliance policy from a "threat-based" to a "capabilities-based" alliance implies that the burden sharing structure will be determined not only by the allies' ability to pay but also by their willingness to participate in military operations.

Indeed, burden sharing appears to be a central feature of the unipolar alliance system. In this paper, we claim that two inter-related systemic factors—external threat and distribution of power—explain the dynamics of alliance burden sharing behavior. In other words, the economic incentives of an alliance and its corresponding alliance burden sharing behavior result from the structural constraints of different international system polarities. Alliances are substantially different in multipolar, bipolar, and unipolar systems.

The paper proceeds as follows. In the first three sections, we summarize the neo-realist and political economy and assessments of alliance behavior in multipolar, bipolar, and unipolar conditions in order to develop a set of hypotheses linking systemic polarity and alliance burden sharing behavior for major and minor powers. Using time–series–cross–section (TSCS) analysis, we then test those hypotheses. Implications are discussed in the conclusion.

System Polarities and Alliance Burden

Multipolarity, Alliance, and Defense Spending

In a multipolar world, once an alliance is formed, it can reduce uncertainty about who is friend and who is foe. Allies become dependent on each other, concentrating aggregated power against their adversaries.[3] Yet, due to fear of defection, or alliance flexibility, such "quasi–structural effects" are not as strong as a bipolar alliance system.[4] Thus, the identification of enemies and aggregated power concentrations are, at best, provisional and temporary. In order to enhance alliance commitments, alliance leaders may adopt a variety of strategies: coordinating foreign policies and military plans,

allocating preparedness burdens, and collaborating during adversary crises.[5] However, such coordination efforts are often ineffective since the core of the multipolar alliance system is derived from "its maintenance and functioning on neutrality of alignment."[6] Moreover, states cannot be assured that even a close ally's increased military effort is for its own sake or for the common interest. Therefore, causal links between alliances and allied defense spending are relatively weak under multipolarity.

Nonetheless, multipolarity tends to produce different patterns of alliance burden sharing between minor powers and major powers allies. As Snyder (1990) points out, the second dilemma, which focuses on alliance management, emerges; states are unsure of whether to strongly or weakly commit to supporting their allies during conflicts with the adversary. In a multipolar world, the unguaranteed commitment problem constitutes a tradeoff between abandonment and entrapment. Abandonment refers to the fear of defection. An ally may realign with the opponent; it may merely de-align; it may fail to make good on its explicit commitments; or it may fail to provide support in contingencies where support is expected.[7] Entrapment refers to "being dragged into a conflict over an ally's interests that one does not share, or shares only partially."[8]

When considering relative capabilities between major and minor power allies, the fear of abandonment may prevail over that of entrapment for the minor power allies. For example, the fate of some city–states (e.g., Baden, Bavaria) and of minor powers located between more than two major power rivalries (e.g., Belgium, Poland) in 19th and early 20th century Europe, was doomed to be determined by the balance of power among multiple major powers. If these smaller players had been abandoned by their patrons, their survival would have been endangered. Moreover, their security dependence on major power allies was dictated by historical backgrounds, diplomatic relations, ideological affinities, and domestic attributes, rather than by their relative capabilities. Thus, minor power allies' defense spending levels are less influenced by alliances. However, the existence of multiple buck–catchers leads minor power allies to ride for free. Therefore, we hypothesize that a minor power aligned with a major power tends to spend less on its national defense.

For major power allies, passing the buck to other major partners and free-riding is attractive, but the systemic features of a multipolar world compel them to maximize power.[9] As Mearsheimer argues, great powers are inclined to look for opportunities to alter the distribution of power whether they try to prevent others from gaining power at their own expense or at the expense of others.[10] Under multipolarity where identification of friend or foe is uncertain, it makes less sense that great powers with formal ties to other great powers would decrease their defense efforts. Thus, we hypothesize that under multipolarity, a great power aligned with another great power is less likely to decrease its defense spending. Hence, our two multipolar hypotheses are:

> *Hypothesis M1: In mulipolarity, a major power aligned with another major power is not likely to decrease its defense spending.*
> *Hypothesis M2: In mulipolarity, a minor power aligned with a major power is likely to decrease its defense spending.*

Bipolarity, Alliances, and Defense Spending

In a bipolar world, balancing politics differs from the mechanisms operating in a multipolar system.[11] For example, Waltz (1979) argues that power imbalance in a bipolar world can only be adjusted by internal efforts of two great powers:

> In a bipolar world, military interdependence declines even more sharply than economic interdependence. Russia and America [the United States] depend militarily on themselves. They balance each other by "internal" instead of "external" means, relying on their own capabilities rather than on the capabilities of allies.[12]

Hence, regardless of the relative capabilities of either major or minor power allies, bandwagoning can be a dominant tendency in the bipolar system.

In a bipolar alliance system, the connection between alliances and defense spending becomes clearer and more predictable. The certainty of threat substantially reduces both the first (chain-ganging versus buck-passing) and second (abandonment versus entrapment) type of alliance dilemma. All states aligned with one of the superpowers are unconcerned about the superpowers' motives for their unrelenting pursuit of power. Rather, they are content to remain on the sidelines and economize their defense effort. They maintain membership in the security umbrella provided by their respective superpower. Plus, the certainty of threat and the distribution of capabilities between the two poles increases alliance cohesion and reduce the fear of defection. In addition, any war or threat of war that may lead to significant gains or losses for either superpower becomes a concern to both of them.[13] Consequently, in a bipolar system, minor allies' contributions toward a common defense are of relatively little importance.

This imbalanced division of labor between two superpowers and their allies and structuralized economic incentives of alliances parallel the non-excludability and non-rivalry of public goods.[14] Olson and Zeckhauser's theory (1969) predicts that free–riding would be common only among minor power allies whose contribution makes little, or no, difference to the provision of collective good. However, allies' defense spending patterns are crystallized by the structural characteristics of the bipolar system rather than by the nature of the collective action problem. In other words, the tendency to free ride should predominate among allies of superpowers, regardless of their relative capabilities. The net benefit of an alliance as a collective good is not necessarily greater to minor allies than major allies, as Olson and Zeckhauser suggest. Minor powers and major powers alike derive benefits from the bipolar alliance system, distinguishing it from multipolarity. Therefore, both major and minor power allies

of the two superpowers benefit from a bipolar system and can reduce their defense spending.

From the viewpoint of structural realists, this bandwagoning behavior is a small, weak state's typical means of gaining security or making temporary gains.[15] The prevalence of bandwagoning during the Cold War, however, undercuts the central realist premise that balancing is the dominant tendency in alliance politics. To fill the gap between the theoretical explanation and the observed behavior of states, Walt (1985) introduces the balance of threat theory, arguing that alignment decisions are driven by the imbalance of threat, not merely by the distribution of power.[16] If the balance of threat mechanism is at work, bandwagoning would not be observed. Despite this theoretical justification of the balancing mechanism, the two superpowers' efforts allowed their allies to decrease their defense spending.

At the same time, the effects of bandwagoning may vary in terms of the contextual difference between the poles. First, the formation of the Soviet alliances was coerced by the Soviets, whereas the American allies voluntarily acquiesced. Snyder (1990) argues that for the American allies, the Sino–Soviet bloc posed a clear common threat, but that the degree of threat perceived among East European allies varied.[17] He also emphasizes that the willingness to take up the burden was observed for the NATO allies but not among Warsaw Pact members. Reisinger (1987) contends that the free-riding principle fares poorly with respect to the Warsaw Pact members in the 1970s, and suggests that a political bargaining model better accounts for the defense spending of the East European alliance.[18] The NATO allies' tendency for "the exploitation of the great by the small" has been relatively stable over time.[19] Thus, we hypothesize that the U.S. allies' burden sharing behavior is likely to differ from that of the Warsaw Pact members under bipolarity, in the following manner:

> *Hypothesis B1: In bipolarity, both a major power and a minor power aligned with the United States are likely to decrease their defense spending.*
> *Hypothesis B2: In bipolarity, both a major power and a minor power aligned with the Soviet Union are unlikely to decrease their defense spending.*

Unipolarity, Alliances, and Defense Spending

In the sense that threat is uncertain and cohesiveness of allied defense is weak, the alliance defense spending pattern in unipolarity appears to be similar to that in multipolarity. However, one fundamental difference is the lack of alliance flexibility that may be brought into different outcomes in terms of defense spending. The unipolar alliance system is preceded by a bipolar world fostering both major and minor power partners.[20] These alliances tend to carry on similar functions to those within a bipolar alliance system. At least temporarily, thus, "an emerging unipole is likely to continue to engage in international affairs, at least through a strategy of defensive dominance—as reflected in the metaphors of a global policemen or night watchman often used to

describe U.S. strategy throughout the 1990s."[21] Then, incentives to bandwagon may still prevail among major and minor power allies of the United States in the early stage of unipolarity.

However, two key systemic features—the absence of structural threat and reduced alliance cohesion—tend to alter the structure of security benefits of alliances. First, a major function of bipolar alliance which bound it together is no longer the principal common interest with the loss of the public enemy. As the proposition of publicness of the collective good model is violated, benefit structures of alliances are likely to be transformed to a joint product that is a combination of pure public, impure public, and private good.[22] In principle, pure public good is unlikely to exist in unipolarity because there are no counterbalancing great powers.[23] Then, the fate of alliances is likely to be determined by the U.S. grand strategy and its security interests.[24] Second, reduced alliance cohesion may intensify the fear of abandonment among the unipole's major and minor allies, especially when they are facing potential aggressors and their dependence on alliances is greater. It is possible that the unipole's alliance strategy moves toward a selective engagement or disengagement strategy.[25] There are two incentives that may drive the unipole to change its grand strategy from preponderance to disengagement: 1) replenishing its power in preparation for contingencies; and 2) avoiding domestic opposition.[26] Under such circumstances, the unipole may take a passive strategy of alliance maintenance provoking great security concern among traditional allies.

An alternative way to avoid an excessive expenditure of military spending while maintaining its power preponderance is reshaping the burden sharing structure of alliances. This is not to say, the unipole will not allow its major and minor power allies to bandwagon. Rather, it means that the unipole would increase demand for alliance burden sharing on its military partners. It is presumable that the pressure of the unipole for allied cost sharing might be greater on major power allies than on its minor power allies. First, the minor power allies' contribution is not likely to lessen the burden of alliance significantly; likewise their contribution makes little change in a public good model. Second, bandwagoning behavior may endanger the destiny of lesser power allies when the unipole's alliance strategy is in conflict with its allies' national interests. Therefore, the unipole's major power allies are likely to spend more on their national defense, as well as on the allied defense to secure alliance cohesion, than the previous bipolar world.

> *Hypothesis U1: In unipolarity, a major power aligned with the United States is not likely to decrease its defense spending.*
> *Hypothesis U2: In unipolarity, a minor power aligned with the United States is less likely to decrease its defense spending than bipolarity.*

Research Design

Based upon neo-realist traditions, we operationalize three system polarities—multi–, bi–, and unipolar—in terms of the number of system leaders defining international system structure differently. It will also focus on burden sharing behavior of both major power and minor power allies of the system leaders to highlight the impact of system polarities on alliance politics.

The units of analysis for this study are monadic state–years from 1885 to 2001. Although there are skeptical views about the validity of time-series cross–sectional (TSCS) analyses on defense spending, the state–year unit analysis may reveal important implications about some general effects of systemic polarities and alliance politics.[27] First, the military spending pattern differs greatly across both space and time. TSCS data is "common in the analysis of data where repeated observations (often annual) are made on the same fixed political units (usually states or countries).[28] Since this study is interested in the structural effects of systemic polarities on the contexts of alliances and allied states' defense spending behavior, it is expected that TSCS estimators would provide the best reflection of alliance politics when the error terms are corrected temporarily and spatially. Second, this quantitative approach may contribute to filling the gap in the studies between alliance politics and defense spending. Despite the abundance of alliance studies, empirical research on defense spending has been limited to qualitative case studies, formal modeling with a small number of allies, or a specific type of alliance that meets both theoretical and methodological conditions of empirical models (i.e., NATO versus the Warsaw Pact, the Triple Entente versus the Triple Alliance). This project seeks to test the general validity of competing hypotheses across a range of data, time periods, and model specifications in terms of structural constraints and alliance behavior, as a comparative foreign policy study.

To create a sample of states and defense spending, the Correlates of War (COW) project data on system membership data, military expenditures, and Russett and Oneal's data for gross domestic product (GDP) are utilized.[29] The time frame between 1885 to 2001 was chosen in terms of data accessibility. Russett and Oneal's GDP data begin in 1885 and end in 2001. In addition, Leeds's Alliance Treaty and Obligations and Provisions (ATOP) data are used to generate alliance variables.[30] To form variables related to external threat, the COW Militarized Interstate Dispute 3.0 data set are used.[31] Overall, the data set is composed of 8481 observations covering 194 nation–states.

Following Beck and Katz[32] and Beck,[33] an Ordinary Least Squares (OLS) regression with panel-corrected standard errors (PCSEs) is employed. OLS is optimal (best linear unbiased) for TSCS models if the errors are assumed to be generated in an uncomplicated (spherical) manner. The number of units analyzed in this project fluctuates from 36 to 194 and the time frame with each unit observed varies from 2 (e.g., Zanzibar and Tuvalu) to 186 (e.g., the U.S. and Great Britain). Thus, both the temporal

and spatial properties of TSCS data make the use of OLS problematic allowing for temporally and spatially correlated errors and heteroscedasticity.[34] By using OLS with PCSEs, the OLS standard errors can be corrected and provide more accurate estimates of the variability of the OLS estimates of β.[35] This model takes into account the contemporaneous correlation of the errors and eliminates any serial correlation of the errors before the panel–corrected standard errors are calculated. Also, in order to rule out temporal dynamics referring to serial correlations of errors of the TSCS data set, a lagged dependent variable is included.[36]

Dependent Variable

The dependent variable is a degree of state defense spending. The most common index of defense spending is military expenditure as a proportion of the Gross Domestic Product (ME/GDP).[37] This index measures how much effort a state is making in attempts to increase its own defense.[38] Although there have been some modifications,[39] this variable has been widely used unaltered in research of alliances and defense spending since its introduction by Olson and Zeckhauser. In the previous literature, the lack of economic data before the postwar period led some researchers to utilize proxy variables to measure the ratio of defense spending over the aggregated national capabilities, for example military personnel and military expenditures for defense effort, population, iron/steel production, and energy consumption for the sum of national income.[40] In this project, Oneal and Russett's GDP data set covering the time period from 1885 to 2001 are employed to measure ME/GDP with the data set of the COW project. It is expected that this data set of a "unified time span" has advantages over that of a "stratified epoch"[41] in comparing structural constraints of different international systems and defense spending behavior. Utilizing Olson and Zeckhauser's variable has two incentives to enable researchers to maintain theoretical consistency and to perform comparative analysis. First, in an alliance relation, a state's defense spending tends to be affected by the amount that its allies provide.[42] As a public good model assumes, the larger members tend to provide the larger amount of the collective good in an unequal group leading the smaller members to ride free because the latter's contribution would make little difference. Although other alliance level factors (e.g., diverse types of military equipment and techniques) may play an important role in varying degrees of allies' defense spending, such a simplified assumption can be utilized as a baseline to examine the causal relationship between alliances and defense spending. Second, this variable can facilitate comparison across states and over time. This measure is not affected by the currency used or by general rates of inflation.[43] Because this project focuses systemic effects of different polarities on the alliance relationship and its defense spending pattern, this measure would provide meaningful implications with relevant empirical findings.

Independent Variables

A number of variables can affect a state's level of military spending. The focus of this project is to examine the impact of alliances with great power states that play a dominant role in defining systemic polarities. In addition, a state's defense spending is influenced by the relative capabilities of alliance seekers. To fulfill a purposive goal of comparative analyses, the status of great powers is coded following the definition of different system polarities. Conceptually, all the major powers in multipolarity are considered as great powers in which one of them cannot have overwhelming capabilities. And the rest of the states are considered as minor powers. Thus, the number of pairs of alliance combination under multipolarity is three: great powers aligned with other great powers (GP–GP); minor powers aligned with great powers (mP–GP); and states not aligned with any of great powers (non-ally). During the bipolar system, two superpowers the United States and the Soviet Union—are considered as great powers generating five types of alliance formations: major powers aligned with the United States (MP–U.S.); minor powers aligned with the United States (mP–U.S.); major powers aligned with the Soviet Union (MP–SU); minor powers aligned with the Soviet Union (mP–SU); and states not aligned with superpowers (non-ally). In a unipolar world, only there exists only one great power, the United States, that enjoys a preponderance of power and faces no competition.[44] Thus, comparable alliance pairs in unipolarity are three: major powers aligned with the United States (MP–U.S.); minor powers aligned with the United States (mP–U.S.); and states not aligned with the United States (non-ally). Table 1 demonstrates the list of great powers from 1816 to 2001.

Table 1. System Polarity and Great Powers

System Structure	State	Start Year	End Year
Multipolarity	Austria–Hungary	1816	1918
	Germany (Prussia)	1816	1918
		1928	1944
	Russia (U.S.S.R.)	1816	1917
		1922	1944
	France	1816	1940
	England	1816	1944
	Italy	1860	1943
	Japan	1895	1944
	United States	1898	1944
Bipolarity	United States	1945	1989
	Russia (U.S.S.R.)	1945	1989
Unipolarity	United States	1990	present

Using these key independent variables has some analytical advantages over traditional coding rules of the COW project. First, despite a fair degree of reliability on the coding rules of major powers in the COW project, the major power status is limited in reflecting practical influences of structural polarities on alliance politics. For

example, during the Cold War period, the Big Fives—the United States, the Soviet Union, England, France, and China—occupying permanent seats on the UN Security Council equipped with nuclear capabilities are coded as major powers in spite of the dramatic gap of relative strengths. Moreover, the number of major powers increases in unipolarity up to seven by including two economic giants, Japan and Germany. If we consider all the major powers as great powers, then, any difference of alliance system is hardly to be found in terms of the changes in systemic polarities.

Second, the existence of multiple great powers in an alliance relation cannot present the reactivity of defense spending among states with different capabilities. For example, the premise of collective good model of nuclear deterrence is that all the U.S. allies have been beneficial from the nuclear protection provided by the sole superpower ally, the United States.[45] Although two other nuclear power allies (e.g., the United Kingdom and France) and some middle powers (e.g., West Germany and Italy) might have contributed marginal costs of nuclear deterrence, it is unthinkable to treat nuclear deterrence as a public good without considering the role of the United States as the unitary security provider. Thus, we can clarify the relationship of the security provider and its beneficiaries by distinguishing the status of the United States as the sole great power with other major powers.

The independent variable—*GPallyt-1*—is a lagged dichotomous variable that is coded 1 if a state forms an alliance with great powers in the year of t during the multipolar system, and 0, otherwise. Although relative capabilities of allies are also an important variable representing degrees of asymmetry and the level of defense spending,[46] the status of great power is operationalized to be dichotomous. This is a theoretically better approach in examining the impact of system polarities and the behavioral changes of alliance defense spending. To specify the impact of two superpower allies during the Cold War era and beyond, two independent variables— *Ally with U.S.t-1* and *Ally with SUt-1*—are generated. Another independent variable is *Alliancet-1* that is also coded dichotomously. To identify this variable, Leeds's Alliance Treaty and Obligations and Provisions (ATOP) data are used including all types of alliances. Although a variety of alliance types would be linked to the behavioral outcomes of alliances, this study highlights that systemic influences of polarities are likely more critical in determining the causal relationship of alliances and defense spending patterns.[47]

Through multiplication of these independent variables and a control variable— Majorpowert—six key independent variables are created: *Major ally with GPt-1 (GPallyt- 1×Majorpowert); Minor ally with GPt-1(GPallyt-1×Minorpowert-1); Major ally with U.S.t-1 (Ally with U.S.t-1×Majorpowert); Minor ally with U.S.t-1 (Ally with U.S.t-1×Minorpowert); Major ally with SUt-1 (Ally with SUt-1×Majorpowert); Minor ally with SUt-1 (Ally with SUt-1×Minorpowert).*

The effect of system polarities will be controlled by three binary variables: *Multipolart; Bipolart; and Unipolart.*

Control Variables

Along with system-level factors, domestic-level variables have been considered as determinants of a state's defense spending. Although a generalized model about defense spending has been rare, previous research demonstrated that a state's defense spending is determined by the size of its economy and its growth rate, regime type, political stability, and social welfare policies, and so forth.[48] To control the impact of the domestic economy, a lagged variable of per capita gross domestic product—*GDPPCt-1* (measured in 1996 constant U.S. dollars)—is employed. In regard to the economic effects on defense spending, there are competing arguments. For example, wealthier states tend to spend proportionally less on military affairs.[49] Others contend that economic decline is positively related to a rise in defense spending.[50]

Domestic political institutions are expected to influence defense spending to a large extent. In particular, research has shown that a state under democratic control tends to spend less on its national defense.[51] To generate a lagged democracy variable—*Democracyt-1*, the Polity IV data set of the COW project are used.[52] All other things being equal, it is reasonable to expect that major powers—*Majorpower*—are more likely to spend more on defense spending. Although there is no study of military expenditures emphasizing the major power status directly, they are more likely to engage in international crises than others so that their proportion of defense spending is greater even during peaceful periods.[53] In addition, major powers tend to have more allies than others leading them to spend more on defense spending to increase their credibility. The impact of militarized interstate disputes (MIDs) and defense spending is also considered. In a recent study, Nordaus, Oneal, and Russett show that fatalities of militarized interstate disputes (MIDs) as an index of external threat are strongly associated not only with a short-term variance of defense spending but also with its long-term trend.[54] Also, it is plausible to expect that military spending behavior would vary whether a state is a MID initiator or target. Thus, two binary variables—lagged MID initiate (*MID_Init-1*) and lagged MID_target (*MID_Tart-1*)—are added.

The base model is as follows:

$$ME/ GDP_t = \beta_1 ME/ GDP_{t-1} + \beta_2 GDP \text{ per Capita}_{t-1} + \beta_3 Democracy_{t-1} + \beta_4 Majorpower_t + \beta_5 MIDs\_initiate_{t-1} + \beta_6 MIDs\_targeted_{t-1} + error\ term_t$$

Next, while utilizing various interaction terms, the impact of great power allies and the behavioral characteristics of alliance defense spending are tested under the three polarity conditions. The full model is as follows:

1) Multipolarity
$$ME/ GDP_t = \beta_1 Major\ ally\ with\ GP_{t-1} + \beta_2 Minor\ ally\ with\ GP_{t-1} + \beta_3 Alliance_{t-1}$$

+ β4 ME/ GDPt-1 + β5GDPPCt-1 + β6Democracy t-1 +β7Major Power t + β8MIDs_ initiate t-1 + β9MIDs_targeted t-1 + error term t

where the omitted category is both major and minor powers not aligned with any of the great powers.

2) Bipolarity

ME/ GDP t = β1 Major ally with U.S.t-1 +β2 Minor ally with U.S.t-1 + β3 Major ally with SUt-1 + β4 Minor ally with SUt-1 + β5Alliancet-1 + β6 ME/ GDPt-1 + β7GDPPCt-1 + β8Democracy t-1 + β9Major Power t + β10MIDs_initiate t-1 + β11MIDs_targeted t-1 + error term t

where the omitted category is both major and minor powers not aligned with either the United States or the Soviet Union.

3) Unipolarity

ME/ GDP t = β1 Major ally with U.S.t-1 +β2 Minor ally with U.S.t-1 + β3Alliancet-1 + β4 ME/ GDPt-1 + β5GDP per Capitat-1 + β6Democracy t-1 + β7Major Power t + β8MIDs_initiate t-1 + β9MIDs_targeted t-1 + error term t

where the omitted category is both major and minor powers not aligned with the United States.

Table 2. Summary Statistics

Variable	Observation	Mean	Std. Dev.	Min	Max	Source
Major ally with GP_{t-1}	12832	0.064	0.245	0	1	COW project/
Minor ally with GP_{t-1}	12832	0.337	0.473	0	1	ATOP
Major ally with $U.S._{t-1}$	12832	0.016	0.127	0	1	
Minor ally with $U.S._{t-1}$	12832	0.236	0.425	0	1	
Major ally with SU_{t-1}	12832	0.004	0.064	0	1	
Minor ally with SU_{t-1}	12832	0.083	0.276	0	1	
ME/GDP_{t-1}	8002	1.679	0.334	0.391	3.571	COW project
$GDPPC_{t-1}$	8787	3313.524	5586.71	12.708	51686.920	Polity VI
$Alliance_{t-1}$	12832	0.624	0.485	0	1	MID 3.0
$Democracy_{t-1}$	12832	0.362	0.481	0	1	
Majorpowert	13045	0.835	0.277	0	1	
Mid_Ini_{t-1}	12832	0.156	0.363	0	1	
Mid_Tar_{t-1}	12832	0.159	0.364	0	1	
Multipolar	13045	0.411	0.492	0	1	COW project
Bipolar	13045	0.419	0.493	0	1	
Unipolar	13045	0.170	0.376	0	1	

Empirical Findings

Table 3 presents the results for the four models. As shown in the base model, almost all the systemic variables hypothesized are generally relevant to the defense sending pattern. The coefficients of various control variables buttress the robustness of empirical testing. First, a lagged variable of GDP per capita, *GDPPCt-1*, is statistically supported but its coefficient is 0.000 indicating that economic growth is not closely associated with a state's defense effort. Also, this result is consistent with previous findings that defense burden is not sensitive to economic conditions.[55] Second, a lagged democracy variable, *Democracyt-1*, is supportive to previous findings that the states under democratic control tend to spend less on defense spending than other types of regimes.[56] Third, as expected, the overall level of defense spending of major powers, *Majorpowert*, is higher than that of minor power states.[57] Finally, regional conflicts measured in numbers of MIDs, *MID_Init-1* and *MID_Tart-1*, strongly support that the existence of regional conflicts is positively related to defense efforts. This result indicates that regional conflict plays a significant role in increasing the focal state's defense spending regardless of whether it is the initiator or target.

Model 1 tests the effect of multipolar system and great power alliances. In order to avoid the collinearity problem, states not allied with any of the great powers are used as a reference category. The result demonstrates that the major powers allied with other major power states or minor power states with major power allies are not statistically related to the level of their defense effort indicating that forming an alliance with great powers has no impact on defense spending in multipolarity. During this period, alliances are also not associated with a degree of state military spending. As hypothesized, ambivalent frontiers between friends and foes might lead them to be reluctant to adjust levels of defense spending regardless of their power status (major versus minor power) and militarized disputes (MID initiate and MID targeted). Rather, it shows that opportunistic behavior prevailed among allies through passing the buck to their partners but not sacrificing their resources to enhance allied defense.[58] These findings indicate that Hypothesis M1 and M2 are empirically supported.

The effects of alliance appear to influence other systemic factors related to a degrees of state defense spending. The variable *Democracyt-1* is still negative and significant (-0.167) indicating that democracies tend to spend less on their defense spending in comparison to other regime types such as monarchies and autocracies. Interestingly, *Majorpowert* is positive but not significant in a multipolar system. As predicted, a strong tendency to pass the buck among multipolar alliances—*Alliancet-1*—would offset causal relationships between relative capabilities and defense spending. In addition, two measurements of regional conflicts—*the number of MID initiated and that of MID targeted*—are statistically not significant indirectly reflecting systemic effects of multipolarity where flexibility of alliance choice cancels out the explanatory power of regional conflicts on national defense spending.

Table 3. System Polarities and the Correlates of Defense Spending

Variable	Base model	Multipolar	Bipolar	Unipolar
Major ally with GP_{t-1}		-0.192		
		(0.221)		
Minor ally with GP_{t-1}		0.106		
		(0.144)		
Not allied with GP		omitted		
Major ally with $U.S._{t-1}$			-1.336***	
			(0.380)	
Minor ally with $U.S._{t-1}$			0.481***	
			(0.100)	
Major ally with SU_{t-1}			1.286***	
			(0.461)	
Minor ally with SU_{t-1}			0.673**	
			(0.300)	
Not allied with superpower			omitted	
Major ally with $U.S._{t-1}$				0.412
				(0.401)
Minor ally with $U.S._{t-1}$				-0.384*
				(0.200)
Not allied with U.S.				omitted
ME/GDP_{t-1}	0.748***	0.819***	0.724***	0.706***
	(0.042)	(0.106)	(0.059)	(0.136)
$GDPPC_{t-1}$	0.000*	0.000**	0.000**	0.000
	(9.73e-06)	(0.000)	(0.000)	(0.000)
$Alliance_{t-1}$		0.138	0.452***	0.319
		(0.131)	(0.152)	(0.197)
$Democracy_{t-1}$	-0.366***	-0.165**	-0.296***	-0.255
	(0.071)	(0.057)	(0.072)	(0.223)
Majorpowert	0.313**	0.267	1.960***	-0.495
	(0.121)	(0.180)	(0.572)	(0.434)
MID_Ini_{t-1}	0.140***	0.039	0.026	0.096
	(0.046)	(0.061)	(0.057)	(0.145)
MID_Tar_{t-1}	0.190***	0.062	0.330**	0.059
	(0.061)	(0.043)	(0.105)	(0.106)
Constant	0.553***	0.123	0.437***	0.357**
	(0.075)	(0.090)	(0.137)	(0.160)
Observations	8,481	1,552	4,954	1,975
Number of ccode (country code)	194	65	162	191

Standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

To specify the effects of characteristics two superpowers and alliance defense spending, Model 2 tests behaviors of the U.S. alliances including NATO and Asian–

Pacific allies and the Soviet allies such as the Warsaw Pact members and others in the Middle East and Africa during the Cold War. First, the correlation coefficient of *Major ally with U.S.t-1* (-1.336) is negative and significant, indicating that two major power allies of the NATO alliance, Great Britain and France, could reduce their defense spending compared to states not aligned with either the United States or the Soviet Union. Also, the defense spending of the U.S. minor allies during the Cold War, *Minor ally with U.S.t-1*, is negative and significant in statistical terms (-0.481). These empirical findings buttress the Hypothesis B1 that both major power and minor power allies of the United States could derive security benefits from the protection of their superpower ally. When examining the effect of the Soviet alliances' on defense spending, only one major power ally of the Soviet Union, communist China, could reduce its defense spending by forming an alliance during the same period (-1.286). Meanwhile, *Minor ally with SUt-1* variable (0.673) indicates that the smaller allies of the Soviet spent relatively more on their national defense than the states not allied with superpowers, buttressing Reisinger's finding that a collective good theory is not applicable to the Warsaw Pact alliances.[59] Then, the Hypothesis B2 is partially supported. Moreover, these findings contradict Olson and Zeckhauser's prediction. Instead, alliances tend to increase their defense spending for the Soviets' minor allies during the Cold War, implying that the exploitation of the small by the larger was dominant among the communist allies.

The correlation coefficients of the economic variables—*ME/ GDPt-1* (0.724) and *GDPPCt-1* (0.000)—consistently demonstrate that the effects of changes in economic capabilities are not critical to defense spending. *Alliancet-1* variable representing the overall impact of alliances not including superpower allies is positive and significant (0.452). This result shows that non-great power alliances are positively related to member states' defense effort. The correlation of Majorpowert variable (1.960) presents that two superpowers consistently spend more on defense spending during the Cold War, seemingly offsetting their major power allies' bandwagoning tendencies. In contrast to the number of MID initiation variable which is not significant, the number of MID targeted, *MID_Tart-1*, is positive and significant (0.330). This result demonstrates that the impact of regional conflicts on defense spending is significant when the purposive goal is defensive but not offensive.

Finally, the effects of unipolarity and alliance defense spending are tested in Model 3. The result shows that the correlation coefficient of the United States. Major power allies is not significant indicating that they are not beneficiaries of bandwagoning any longer under unipolarity. This finding contradicts Wohlforth's prediction that systemic stability of unipolarity results from the bandwagoning tendency of the second–tier states to the unipole's primacy.[60] Although the U.S. minor allies are still deriving benefits from the allied defense, it is important to note that the marginal effect of the U.S. alliance in unipolarity (-0.384) is not as strong as that of bipolarity (-0.481) than non-U.S. allies. Then, it appears that unprecedented system shift to unipolarity

has transformed the structure of alliance cost sharing to a large extent. In short, the Hypothesis U1 and U2 are empirically supported.

Other control variables indicate that systemic effects on unipolar alliances are similar to those of multipolar systems. First, there is no variation in economic factors in the unipolar system. Second, *Alliancet-1* variable is positive but not significant as in the multipolar alliances. However, the underlying condition of a weakening causal relationship of alliances and defense spending in unipolarity might be different from the relationship in a multipolar world. In particular, this result stems from systemic features of unipolarity where non-U.S. alliances are unlikely to produce security benefits. *Democracyt-1* variable is also insignificant indicating that ideological affinity becomes less important in the unipolar alliance system, or an increase in numbers of democracies in the post–Cold War era tends to cancel out the causal relationship of regime type and defense spending. *Majorpowert* variable is negative but not significant in statistical terms, supporting systemic characteristics of unipolarity in which no major powers, or their coalition, can possibly challenge the unipole's primacy.[61] To some extent, this finding can be explained by the enlarged role of the unipole as "global policemen", an increase in the numbers of UN peacekeeping missions, or enhanced interdependence in the post–Cold War era.[62]

In sum, there are some important findings that are noteworthy. First, structural features of different polarities are an important variable in determining the levels of defense effort. Systemic effects demonstrate that states tend to increase their defense effort when the external threat is structural and clear (i.e., bipolarity) while they are not likely to spend on national defense when the threat is non-structural and underspecified (i.e., unipolarity). Moreover, the ambiguity of friends and foes in multipolarity may weaken the causal relationship of alliances and the level of defense spending. Second, the impact of alliance with great powers is not fixed but sensitive to changes in system structures. As predicted, alliance is, in general, positively associated with defense spending, and minor powers allied with great powers tend to enjoy security benefits at reduced costs. However, systemic polarities may restructure alliance functions, and in so doing, they also shift alliance security benefits. Third, the bipolar alliance system demonstrates that the superpowers' characteristics play a decisive role in determining the nature of security good that an alliance provides. This finding implies that a collective good problem of alliance is not universal in terms of the size of memberships and the relative capabilities of member states.

Conclusion

The unprecedented unipolar system followed by the end of the Cold War has lasted over three decades. With a structural shift to the American-led unipolarity, alliance politics is experiencing substantial changes from a structural "threat-based" to a non-

structural "capabilities-based" relationship. In the absence of structural constraints that have predetermined the role and function of alliances, alliance relations are entirely dependent upon the combinations of each ally's specific security interest. Although the contemporary U.S.-centered alliance system is originated from the Cold War confrontation, the efficiency of the alliance is intrinsically different. First, a preponderance of power maintained by the unipole gives the U.S. authority to identify both possible sources of threat and potential allies.[63] A reshaped unipolar distribution of power also has transformed the nature of intra-alliance bargaining, based on the necessity of allied defense and the availability of alternative options that are determined by an ally-specific security context and its own capabilities. Lots of localized non-structural threats that had been managed by strategic interests of the two system leaders during the Cold War era must now be handled by the states that are involved geographically and strategically. Otherwise, traditional U.S. allies should provide increased burdens to the alliances in compensation for the assurance of the U.S. security protection. In this sense, behavioral change in alliance burden sharing is the most dominant indicator representing the nature of unipolar alliance politics.

In the *National Defense Strategy 2022*, the Biden administration emphasizes that the post–Cold War system has been definitely terminated, and therefore is preparing for challenges from regional great powers such as Russia and China. But it is premature to conclude that the U.S.-led unipolarity is reshaping a new multipolar system. Rather, the United States introduces the concept of "integrated deterrence" to cope with possible competitors or adversaries with the support of U.S. allies and partners. As observed in the Russo–Ukrainian War in 2022, new types of alliance burden are assigned to the U.S. allies and like-minded states to confront Russian threat towards democratic Ukraine. In other words, it is necessary to focus on behavioral changes in alliance burden–sharing among U.S. allies as long as the U.S.-led world order is manintained.

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