

# Regions of Hierarchy and Security: US Troop Deployments, Spatial Relations, and Defense Burdens

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## **Abstract**

Recent research has begun to explore the effects that foreign military deployments have on the foreign policy choices of their host-states. However, this work has largely ignored the broader regional environment in which these deployments, and the host-states themselves, exist. Using data on US overseas military deployments between 1950 and 2005, we argue that the effect of these deployments is conditional upon the broader regional security environment. We find that most states hosting US military deployments tend to have lower defense burdens, but only when surrounded by other states hosting US military deployments. Alternatively, most states respond to larger regional US deployments by increasing their defense burdens, but only when they themselves host smaller deployments of US forces.

Over the past 70 years, the United States has expanded its security ties around the globe. A major component of this expansion has involved the deployment of troops to other countries. In spite of their importance for US grand strategy and their enduring nature, little research has been devoted to understanding the potential consequences of such deployments. However, in recent years a growing body of work examines issues associated with US military deployments, including economic growth, trade, investment, security policy, conflict behavior, and crime (Biglaiser & DeRouen 2007, Biglaiser & DeRouen 2009, Jones & Kane 2012, Allen & Flynn 2013, Machain & Morgan 2013). While the quantitative international relations literature covering this issue area has grown significantly in the last five years, it is far from comprehensive. Existing studies typically focus on the host-state's response to US troop deployments in a dyadic fashion, with little attention to broader regional context in which the host-state and deployments reside. Herein, we examine how the deployment of US military forces throughout a region condition how host-states respond to the deployment of US forces within their own territory.

Understanding the relationship between the United States' global deployments and the broader environment such deployments create can lead us to valuable theoretical insights into the forces affecting states' foreign policy choices, and can also elucidate the dynamics of complex relationships frequently confronted by policymakers in crafting foreign policy. States' foreign policy choices are not made in isolation from the foreign policy decisions made by other states, but most research does not take spatial dynamics into consideration. For example, recent theoretical work on the hierarchical relationships established by the US since the end of World War II has typically focused on the contractual bargains struck between the US and its subordinate states (Lake 1999, Lake 2009, Ikenberry 2011). However, when a state's leaders make a policy decision those leaders are making that decision within the context of their regional political relationships, as well as in the context of their relationship with major powers like the US. Similarly, the US has widespread interests, and military deployments to any given state are often made with an eye towards broader regional security issues, not just the security of the host-state. As scholars of

regional security politics have noted, the projection of military power into a state by major powers like the US necessarily alter the nature of regional security relationships (Frazier & Stewart-Ingersoll 2010, Destradi & Gundlach 2013). The resulting decision-making environment creates different levels of permissiveness in states' compliance in negotiating and cooperating with major powers, as missteps may lead to confrontation with other regional powers, or the major power itself.

Second, domestic debates over defense spending and force posture are common in the US. At the writing of this manuscript, US defense officials announced broad-based cuts to military programs and personnel—an action that can fundamentally alter the relationship between states across the globe. Such changes have implications for the security relationships that the US has established with other states. Opponents of such cuts often argue that reducing military spending will endanger US security, threaten its ability to honor commitments to allies, and that they will produce more costly arms races among other states. However, how a state reacts to reductions in US military force projection depends upon the broader political environment that state resides in. This, in turn, should affect the calculations of policymakers in deciding where to make cuts without leading to significant losses in overall security and stability.

In this paper, we offer two major advancements over previous scholarship—one theoretical and one methodological. First, by adopting a theoretical framework that builds off of previous work on hierarchical relationships and contractual security arrangements in international relations (see Lake 1999, Lake 2009), our study contributes to the development of our understanding of how the relationships (or lack thereof) that the US has with other states in the surrounding region affect the security relationships forged between the US and a given state. Second, we assess our theoretical contribution by examining the effect regional troop deployments have on the behavior of states. We expect and find that there is a conditional relationship between the number of US troops within a state, the number of US troops in the state's proximate region, and how much a state is willing to devote to military spending. To ascertain the impact of the conditional effect, we employ a

series of regression models estimating defense burdens of all states as well as across three different sub-samples: North Atlantic Treaty Organization (NATO) allies, non-NATO allies of the United States, and states that are not allies of the United States. We find that in states with zero to a few US troops, regional US troop deployments have a positive impact on defense expenditures in those states. But the effect of regional deployments on defense spending diminishes as a state itself hosts a larger number of US troops within its own territory. In addition, along with previous work in this area, larger regional deployments correlate with positive increases in defense expenditures for NATO allies, and the number of troops that are within the borders of a NATO member amplifies the joint-production model of security-provision. Additionally, we find that this behavior is unique and separate from existing US security alliances throughout the region.

## **Regional Hierarchies, Troop Deployments, Defense Spending**

We begin by using Lake's (2009) work on hierarchy and state sovereignty as a basis for our theoretical framework. Lake (2009), in line with his previous work on hierarchy and security relationships between states (Lake 1996, Lake 1999, Lake 2001), argues that a state's sovereignty is a flexible concept that fluctuates temporally and spatially. States can share and trade away components of their sovereignty to other states in both domestic and international contexts in exchange for another state's sovereignty, or for economic and security based side-payments.

Some scholars argue that sovereignty-security exchanges characterize US foreign policy during the post-war period (Lake 1999, Lake 2009, Ikenberry 2011). The US has established relationships with other states characterized by varying degrees of hierarchical control and subordination. In exchange for ceding some degree of autonomy over their foreign policy to the US, states receive security guarantees from the US. The exact nature of these policy swaps leads to the formation of contractual hierarchical relationships between the US and other countries. Lake views organizations like NATO as being examples of relatively anarchic arrangements, while US relations with Japan and many Latin American countries represent more hierarchical arrangements. Mor-

row (1991) articulates a similar theoretical logic concerning the security–autonomy trade-off that is inherent in the formation of alliance agreements. Specifically, he argues that greater power disparities should produce alliances where one state is ceding greater autonomy over the conduct of its foreign policy in exchange for security from the more powerful state, whereas smaller power disparities may produce mutual gains in the production of security. The empirical implications of this theoretical logic concern how security ties with a major power like the US affects the subordinate state’s foreign policymaking. The more hierarchical a relationship, the more constrained a subordinated state should be in its foreign policy behavior. In evaluating these dynamics, Lake (2009) finds that subordinate states reduce their defense burden.

Recent work on the effect of US troop deployments on host-state defense spending (Machain & Morgan 2013, Allen, Flynn & VanDusky-Allen 2014) provides additional support for this finding. US troop deployments can serve as a proxy for the security–autonomy trade-off. The more troops the US deploys to a state, the more security the US is providing for that state, and hence the more the state is willing to cede its sovereignty to the US. Accordingly, in most cases the host-state will reduce its defense capabilities since it has less control over foreign policy decision-making. As such, Machain & Morgan (2013) find that states hosting larger deployments tend to have smaller militaries in terms of military personnel.

This expectation of increased troop deployments leading to decreased investments in defense is the primary finding that relates to our research and is the normal expectation of scholars in the field. It is also a basic economic function: when an actor finds a good that is a cheaper substitute for the good the actor intended to purchase, that actor will be less likely to continue to purchase the expensive good and prefer the cheaper alternative. In line with Lake (2009), Morgan & Palmer’s (2003) findings suggest that states are willing to trade away sovereignty and reduce their defense burden because the US can provide security at a cheaper price than the host-state can.

Allen, Flynn & VanDusky-Allen (2014) also build upon Lake (2009) and Machain & Morgan (2013) by combining elements of Lake’s contractual sovereignty model, the two-good model

of foreign policy, and guns-versus-butter models of government provision of public goods. They argue that the extent to which a state is willing to trade away sovereignty to the US (i.e. reduce defense spending) in exchange for security depends on the relationship between the US and the host-state, as well as characteristics of the host-state itself. Specifically, for many states, it is true that there is a negative correlation between the size of US troop deployments and that state's defense burden. However, this dynamic does not hold for members of the North Atlantic Treaty Organization (NATO). Unlike most other states that contribute less to their own defense expenditures, NATO states engage in the joint-production of security, with member-states actually *increasing* their expenditures as the US deploys more troops in their territory. Allen, Flynn & VanDusky-Allen (2014) argue that while this finding is at odds with the initial theoretical logic of contractual security relationships, it makes sense when we consider the relative power of NATO members and that NATO allies are capable of providing security that is of a similar quality to US security. Hence, NATO allies can actually provide additional security to the US and are more capable of resisting US demands to cede sovereignty in exchange for security. This result is also possibly due to the larger regional and global threat environment posed by the West's confrontation with the Soviet Union and the Warsaw Pact; however, the findings persist beyond the Cold War as well.

In addition to the finding that alliance structures can condition how states respond to the deployment of US military forces, a primary innovation of Allen, Flynn & VanDusky-Allen's (2014) study is that the authors also examine the effects of regional US troop deployments. As the authors note, US troops are often deployed—and security relations established—with an eye towards the broader regional security environment surrounding a given state. Extending their basic theoretical argument, the authors suggest that regional deployments should have effects that are similar to those of host-state deployments. If regional troop deployments are also a proxy for the extent to which the US establishes hierarchical relationships with other countries, and countries reduce defense expenditures as they become more subordinate to the US, then a state surrounded by large US deployments should reduce its own defense expenditures because the overall level of regional

military spending should be lower in the presence of large US deployments. However, their results contradict this theoretical expectation: as the number of US troops deployed to a region surrounding a state increases, defense spending in that state increases. This finding is consistently positive for every subsample they test. That is, whether a state is an ally, non-ally, or NATO ally of the US, the more troops that surround their country on average, the more a state spends. Hence, while it is possible that troop deployments to a host-state are a good indicator of the extent of the hierarchical relationship between host-states and the US, the extent to which regional troop deployments measure hierarchy may be more nuanced. This puzzle motivates our research to address the question of how regions of hierarchy influence the behavior of states.

### **Regions of Hierarchy**

To understand why larger regional military deployments appear to correlate with larger defense budgets, we draw on Lake's (2009) work on hierarchy as the basis of our theoretical argument. At the most basic level, this theoretical framework assumes that sovereignty is fungible, and that all states can enter into relationships where they agree to trade their formal sovereignty over some policy area in exchange for direct or indirect benefits, such as security. Alternatively, states can agree to provide goods, like security, in exchange for some portion of another state's sovereignty—control over some aspect of foreign policy, for example. Reasons for such trade-offs differ. A state may cede some or all of its sovereignty over some issue area where it believes it cannot achieve its desired outcome alone. This practice is as old as alliance formation in the realm of security. For example, a less powerful state may agree to cede some control over its foreign policy in exchange for the protection of a more powerful state. The smaller state sacrifices some of its autonomy in exchange for the benefit of added security, provided by the more powerful state. The more powerful state, in turn, receives greater control and flexibility in its own foreign policy choice by providing security to the less powerful state (Morrow 1991). Such a trade-off may yield benefits for the more powerful state, but some historical examples include basing rights, or the use of the weaker state's airspace for the more powerful state.



When entering into an alliance, one of the perennial fears of another state is that its partner will squelch on their agreement (Leeds & Anac 2005, Leeds & Savun 2007). Abandoning alliance commitments is an empirical reality and the correlates for identifying a good alliance partner are not deterministic; even states that seem to meet all the requirements for a reliable alliance partner still may not live up to its obligation. Lake (1996) argues that this occurrence is not a surprise in international relations and represents a classic principal–agent problem. As with any principal–agent problem, there are a multitude of tools a state can use to design a contract such that a principal can isolate a good agent from a bad one or, if distinguishing good from bad signals is too problematic, a principal can use costly monitoring as a mechanism to ensure good agent performance. For Lake (1996), then, an intense monitoring regime in alliance formation is indicative of a stronger alliance partner (the principal) fearing agency-loss and paying the high costs of monitoring to ensure compliance. Generally, a major power only does this if the costs of alliance abandonment are higher than the costs of monitoring. Additionally, the extreme forms of costly monitoring look akin to the Warsaw Pact or, even costlier, empire.

The United States, as a consistently powerful major power since the end of World War II, has engaged in a series of these relationships with other nations. The extent of its compacts with other states run the gamut of “anarchical” such as in the NATO alliance (i.e., partner states have greater influence in alliance decision-making), to empire, in cases such as Germany and Japan in the late 1940s and early 1950s (i.e., partner states have little influence in decision-making). How much a state falls under the umbrella of the US control both enables and disables a state’s function in the international arena. Traditional types of cooperation problems, like the classic security dilemma, begin to evaporate for a state if it and its potential partner are under a similar hierarchical relationship (Cooley 2008). Any potential for total war for the two states becomes improbable when the US hosts troops in both countries; the US would be necessarily involved in an inter-state dispute, and if both countries rely upon the US for security, then the US becomes the ultimate arbiter between the states. Thus, Lake (2009) suggests these hierarchies create the conditions for

a liberal Pax Americana. As US hierarchy expands horizontally and vertically, the likelihood for conflict decreases and interdependence increases.

We depart from Lake's model in one significant way. Fundamentally, we are building upon Lake's theory of hierarchy, but we focus on components are not explicitly addressed in Lake's work. First, most of Lake's theories and tests happen in dyadic, or at best, triadic contexts. When observing a state and its behavior, Lake generally examines how much a state is under US hierarchy without direct consideration for the state's regional environment. In this way, we offer a major advancement in Lake's theory is by loosening the assumption of bilateral hierarchies, and examining regions and networks of hierarchies as well. While the bilateral interaction between the United States and a country is important in establishing the hierarchical relationship between these two actors, interaction between the US and other states in the country's region also influences the relationship between the US and the target country. In other words, a state's decision to outsource its security commitments and its foreign policy to the US is a result of both dyadic and n-adic pressures. In addition, domestic factors influence whether a state builds a hierarchical relationship with the US. Domestically, new budget constraints, political pressures, or leadership considerations can encourage a state to seek partnerships with another country. We posit that these sets of monadic pressures do not exist in an intertwined vacuum, but also conditioned by the evolving regional environment a host-state is in.

### **Theory and Expectations**

In this section we begin by building a basic theoretical framework to explain why states concede foreign policy authority to the US in exchange for security. We argue that the dyadic relationship between the US and a state alone cannot explain the extent to which states cede authority to the US. Instead, the combination between (1) the dyadic relationship between the US and the state and (2) the n-adic relationship between the US and other countries in the state's region jointly explains states' concessions. In other words, there is an interaction effect between dyadic relationships and n-adic relationships, and concessions.

Building off of previous studies (see Lake 2009, Machain & Morgan 2013, Allen, Flynn & VanDusky-Allen 2014) we use troop deployments as a proxy for the extent to which the US offers security to host countries and regions throughout the world. The basic assumption underpinning our argument is that by placing troops in other states the US is creating hierarchical relationships with those host-states. More hierarchical relationships associate with a greater dominant-subordinate relationship between the US and the host-state, respectively. Using this framework, we argue that when we consider a given state, there are four basic environments that can exist in accordance with the deployment of US military forces in relation to that state:

1. No influence: The US places little to no troops in either the potential host-state or the surrounding region.
2. Host-state influence only
3. Regional influence only
4. Regional and host-state influence

The amount of foreign policy influence states are willing to concede to the US depends on which of these conditions exists. Figure 1 displays our most general expectations using a simple 2x2 table. We assume that the number of US troops deployed to an observed state itself is the strongest influence over that state's foreign policy choice. As such, the US should only exert a small amount of influence over states that only host a small number of US troops regardless of the number of US troops in the host-state's region.

For present purposes we will assume we are looking at an environment in which the US stations at least some troops in either the host-state or the surrounding region, though the marginal difference between a small deployment and no deployment may be negligible. If the observed state itself hosts few US troops and is surrounded by states who also host few US troops, then we should

expect the influence of the US over the observed state to be relatively low. Under such conditions the US has weak security ties with all states in a given region.

Next, even if a state is surrounded by states hosting a large number of US military forces, we should still expect relatively low US influence over a state that hosts few US troops. Though a large regional presence may produce a marginal increase in the degree to which the observed state complies with US leadership, the US has less influence over a state since the US has not deployed many troops within the state's borders.

Next, we should expect the US to have a lot more influence over states that host a large number of US troops. However, the amount of influence the US exerts in these types of states depends on the number of regional US troop deployments. If the US only deploys a small number of troops to a host-state's region, the US is mostly providing domestic security to the host-state. Accordingly, the host-state should be willing to cede only a medium amount authority over foreign policy decisions to the US when neighborhood deployments are small.

On the other hand, when the US hosts a large number of troops in a region, a host-state not only benefits from the domestic security the US is providing, it also benefits from the regional security the US is providing. Hence, the US is offering a great deal of security for the host-state and as such, the host-state should be willing to concede a great deal of autonomy to the US.

\*\*\* Figure 1 about here \*\*\*

Existing work has found that when subordinate states concede foreign policy authority to the US, they should reduce their defense burden and allocate resources to other policy areas in which they exercises more control (Allen, Flynn & VanDusky-Allen 2014). However, the preceding discussion implies that this extent to which states reduce their defense burdens is conditional upon regional factors. Host-states in regions with small neighborhood troop deployments may be reluctant to decrease their defense burdens, while host-states in regions with a large number of US troops will significantly decrease their defense burden in exchange for US troops. This leads to the

first conditional hypothesis:

**Hypothesis 1.** *As the size of regional troop deployments surrounding a host-state increases, the negative effect that US troop deployments in that state have on the host-state's defense spending becomes stronger.*

The preceding hypothesis represents our most general expectations. We follow Allen, Flynn & VanDusky-Allen (2014) in our empirical strategy and look at four samples of states: all states, non-allies of the US, non-NATO allies of the US, and NATO members. In three of the four subsamples—all states, non-US allies, and non-allies—we expect the general hypothesis to hold true. However, Allen, Flynn & VanDusky-Allen (2014) have shown that NATO countries behave differently as a result of the institutional design of the NATO alliance and because NATO states tend to be closer in power and capabilities to the US. The relationships between the US and NATO states have typically been regarded as a more anarchic in nature (see Lake 1999), in spite of the large number of US military forces deployed to NATO states. Because they tend to be larger, more developed, and more powerful states, the defense efforts of NATO states are more likely to contribute to US security (Morrow 1991, Lake 1999). Thus the US is more likely to encourage NATO members to spend more on defense, rather than to cut their defense expenditures. Contributions to the collective defense have long been a concern among NATO members, and previous work has also found that NATO tend to follow the lead of the US in terms of raising and lowering defense expenditures (Palmer 1990*b*, Palmer 1990*a*). Accordingly, because NATO states are so tightly clustered geographically, increases or decreases in US troop deployments within *and around* any given NATO state are likely to reflect broader increases or decreases in US contributions to NATO. This is a sort of virtuous regional cycle where more regional and host-state US deployments lead to more spending, and perhaps, further deployments by the US. As such, we expect NATO allies to increase defense spending when the US deploys troops within their borders. We also expect this positive effect to increase as the number of regional troops increases. Thus, we get our second hypothesis explicit to NATO states:

**Hypothesis 2.** *As the number of regional troops surrounding a NATO host-state increases, the positive impact that US troop deployments in that state have on the host-state's defense spending becomes stronger.*

## **State Responses to Regional Deployments**

The previous hypotheses focus on how states respond to increases in troop deployments *within* their own borders. But how do states respond when the US increases troop deployments in the *regions* surrounding their borders? One of the central puzzles to emerge from Allen, Flynn & VanDusky-Allen (2014) is that there appears to be a general positive correlation between regional troop deployments and the observed state's defense burden. The authors speculate that this could be the result of large regional troop deployments acting as a proxy of sorts for regional security threats. They also note that Machain & Morgan (2013) find a positive correlation between US troop deployments and conflict initiation, and that states may be increasing defense spending because the presence of US deployments in neighboring states makes those states more likely to act aggressively.

To begin, we focus on states that our previous discussion ignored: states with no formal security ties to the US. When the US places troops with a region, states that do not have alliance ties with the US and do not host US troops may view regional troops as a threat. Increases in US security forces in their region increases the military capabilities of the state's neighbors and hence reduces the state's relative power within the region. In addition, even if the US does not pose a direct threat, a state with no alliance ties to the US and that hosts no troops has no contractual security guarantees from the US. Accordingly, the state in question has a greater need to provide for itself. As such, as the number of US troops in a region increases, states with no security ties to the US may increase their defense burdens in order to moderate their relative losses in power.

Alternatively, states that do have formal alliance ties with the US have less reason to increase their own defense expenditures in response to increases in US troop deployments in their region.

Since the US is already providing the host-state security through a formal alliance, the US providing a host-state's neighbors with security through the deployment of military forces does not diminish the allied state's security vis-à-vis the other states in its neighborhood. We do not argue that the presence of an alliance necessarily eliminates the dynamics we expect for non-allied states, but we should expect the additional layer of security provided by the alliance to dampen these effects to some degree. This leads to Hypothesis 3:

**Hypothesis 3.** *As the number of troops within a host-state increases, the positive impact that regional US troop deployments around that state have on the host-state's defense spending weakens.*

Following our discussion from the previous section, we expect NATO allies to increase their defense spending in exchange for troops. We expect this condition to hold for regional troops as well. As noted above, the close geographic proximity of NATO states suggests that increasing regional deployments are indicative of greater US contributions to NATO defense. Hence, as the number of regional troops around NATO allies increase, NATO allies increase their defense burden.

**Hypothesis 4.** *As the number of troops within NATO ally increases, the positive impact that regional US troop deployments around that state have on the host-state's defense spending increases.*

## Research Design

Given the advances made and the empirical question left by Allen, Flynn & VanDusky-Allen (2014), we base our research design on their empirical analysis. As such, we employ similar control variables and an estimation strategy similar to their initial estimations. We use a country-year unit of analysis where the dependent variable of interest is the defense burden of the observed state; that is, the amount a country spends on its military divided by its Gross Domestic Product for that year. We use Gleditsch's (2002) data for GDP and the Correlates of War project's National Material Capabilities to determine the defense spending of a country for a given year (Singer 1987, Sarkees & Wayman 2010).

Our main independent variables are US troop deployments to the host-state, and a measure of regional troop deployments surrounding the host-state. The first measure is the number of troops in an observed country and the second measure is the average number of troops in all neighboring countries.<sup>1</sup> We construct both of these measures from Kane's (2006) data on US troop deployment for the years 1951–2005 (Kane 2011, Jones & Kane 2012). We take the natural log of both variables to adjust for extraneous cases, and because we have an expectation that there are diminishing returns from deploying soldiers to a country or region.<sup>2</sup>

Notably, while these are the two primary variables of interest in how they relate to defense burdens, they are not capable of explaining changes in defense burden in isolation. According to our theoretical argument, we expect them to jointly influence the level of a state's defense burden. Accordingly, we construct a third interactive measure between the two variables. This interaction term will allow us to examine how states respond to changes in US troop deployments within their borders given the number of US troops in their region. It will also allow us to examine how states respond to changes in regional troop deployments given the number of US troops within their borders. Because our interest is in the conditioning effect of both the host-state and regional measures of troop deployments (i.e., *X* and *Z* jointly, not in isolation), we follow the advice of Berry, Golder & Milton (2012) when calculating and presenting the marginal effect of these each of these variables.

Our models includes several factors that causally influence military spending. We include the 21–point measure of Polity from the Polity IV dataset as we expect democratic states to spend less on their military when holding all else constant (Marshall, Jaggers & Gurr 2011, Goldsmith 2003, Fordham & Walker 2005). Economic growth affords the state the possibility to spend more on

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<sup>1</sup>We identified Neighboring countries by using the Correlates of War's Direct Contiguity Data (Stinnett, Tir, Schafer, Diehl & Gochman 2002). We include all states falling within one of the five-point categories when calculating our spatial measure.

<sup>2</sup>Note that because there are 19 cases in which the spatial average falls between 0 and 1, logging all positive values will produce logged values falling below 0. To avoid having logged values falling below "true" 0 values we add 1 to the spatial variable before logging it.



its military. Using GDP data from Gleditsch (2002), we include the percentage change in GDP to account for this facet. To account for the trade-off between defense spending and domestic demands for spending on other social issues, we include the Infant Mortality Rate in a country. If there really is a guns-versus-butter trade-off between social spending and military spending, then previous studies suggest that the infant mortality rate acts as an exogenous pressure for social spending and allows us to control for a negative pressure on defense burdens (Abouharb & Kimball 2007, Kimball 2010, Allen & Digiuseppe 2013). We expect larger states to spend more on defense, and so we include a logged measure of the observed state's total population using data obtained from the COW project's National Material Capabilities dataset (Singer 1987).

We also include variables to control for varying forms of military and security pressures that may condition both defense spending and troop deployments to a country. Externally, we account for whether or not a state is at war during the observed year (Sarkees & Wayman 2010), the number of Militarized Interstate Disputes involving the country over the past three years (Ghosn, Palmer & Bremer 2004), and the threat environment a country faces (Leeds & Savun 2007). We generate the first two variables using the respective COW datasets, and we use a combination of S scores (Signorino & Ritter 1999, Sweeney & Keshk 2005) and COW NMC data (Singer 1987) to generate the threat environment by following the procedure outlined by Leeds & Savun (2007). The fourth threat variable is simply the number of border states surrounding a country as a measure of the opportunities for conflict a state has (Stinnett et al. 2002, Bremer 1992). Our internal measure of threat that ought to generate higher defense burdens is whether a civil war (as per the COW intra-state war data set) is ongoing within a country (Sarkees & Wayman 2010).

Additionally, we are sensitive to the concept that our models may be capturing normal alliance relationships and behaviors that a troop-based estimation strategy would proxy; that is, there is a significant possibility that regional alliance structures would magnify the effect we estimate from troop deployments. Consequently, we include two control variables to isolate the effects of alliance behaviors from troop deployment behaviors. First, we include a spatial metric that accounts for the

average number of allies a state has in its immediate region; the variable ranges from zero to one where a zero represents that a state has no neighboring allies while a one indicates that all of its neighbors are allied with the observed state. Additionally, to isolate regional US troop deployments from the effects we expect from regional US allies, we also include a variable that measures the average number of US allies around the observed state. Both of these variables capture whether the state is in a friendly, allied region and whether the state is in a region of US allies. Both of these variables are unique to our study and give us additional explanatory power on how regional troop deployments independently effect defense spending behavior. We derive information about alliances from the Alliance Treaty Obligations and Provisions (ATOP) project and exclude non-aggression pacts from the variable as we are interested in controlling for alliances that are security enhancing (Leeds, Ritter, Mitchell & Long 2002).

Finally, we run four different models using different sub-samples, since we have different theoretical expectations for different types of states. To capture our most general expectations we first run a pooled model that includes all states. Next, we divide the sample into three separate sub-samples: 1) Non-NATO allies of the US, 2) NATO members, and 3) States that have no alliances ties with the US.

Given the cross-sectional time series structure of our study, we estimate our models using a Prais–Winsten regression with panel-corrected standard errors and an AR(1) serial structure.<sup>3</sup> Given that our dependent variable is likely related to the dependent variable in the previous time-period, this structure enables us to account for some of the effects of temporal correlation.

## Results

Table 1 displays the results of the four empirical models. Because we expect  $\ln(Troops)$  and  $\ln(Troops\ Spatial\ Mean)$  each to exert an effect that is conditional upon the other variable, we

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<sup>3</sup>Wooldridge's (2010) test of serial correlation in panel indicates the presence of serial correlation in all four sub-samples, yielding p values < .05 in each case. Visual inspection of the residuals also warrants correcting for serial correlation.

use marginal effects graphs to interpret their combined effect on *Defense Burden*. We begin by examining the effect of  $\ln(\text{Troops})$  on *Defense Burden* across different levels of Regional Deployment Size, as displayed in Figure 2. Note that each panel number in Figure 2 corresponds to the matching model in Table 1.

\*\*\* Table 1 about here \*\*\*

The results from Figure 2 generally support Hypothesis 1. First, according to Panel 1, the sample including all countries, the marginal effect of an increase in the size of the US troop deployment to the host-state is not statistically significant when regional deployments are small. As the average size of the regional deployments surrounding the host-state increase, however, increasing the size of the US troop deployment to the host-state begins to have the hypothesized negative effect on that state's defense burden. The marginal effect shown in Panel 1 of Figure 2 undergoes a statistically significant change in magnitude within the range of statistical significance. As the average size of regional troop deployments increases, states reduce their defense burdens at a greater rate in exchange for US troops. At the higher end of regional troop deployments, as the number of US troops within the host-state increases by 1%, the host-state decreases their defense burden by about 0.005%.

Importantly, these results hold when we control for neighborhood effects of existing alliances. The Spatial Ally Mean variable, which measures the average number an ally has in its neighborhood, positively correlates with defense spending in both the pooled sample and the non-allies sample, but tracks negatively with the non-NATO sample. Alternatively, being in a region of all US allies leads to free-riding behavior in the pooled model while it encourages a joint-production model of defense spending in the NATO-ally only model, which is consistent with previous expectations.<sup>4</sup>

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<sup>4</sup>When we exclude the spatial measures for the means of regional allies and means of regional US allies, the results for the variables of interest remain consistent with minor variation in the magnitudes of the coefficients.

Panel 1 of Figure 2 shows only the most general effects that we expect. The results also suggest that non-NATO allies and non-allies exhibit somewhat different responses to the presence of US military forces in and around their territory. Non-NATO allies do decrease defense spending in exchange for US troops, but only when regional deployments are large. This effect does not become negative and significant until the average size of regional troop deployments is about 20,000. However, this decrease in spending is substantively smaller than the effect for the pooled model shown in Panel 1. On the other hand, non-allies are much more responsive to US troops deployments to their states. When the average regional deployment approaches 30–40 troops, we expect non-allied states to decrease defense spending when the US places troops within its borders. This dynamic represents more of a threshold effect, however, as the magnitude of the marginal effect of US deployments to non-allied states does not yield a statistically significant increase in magnitude as the number of regional troops increases over 40. Still, this finding supports our theoretical expectations—when the US is lacking hierarchical relationships with the states around a non-allied state, the observed state is unlikely to decrease its defense expenditures in response to increasing US troop deployments. However, once it is clear that the US has a stronger presence in the surrounding region, non-allies should begin responding to larger US deployments by decreasing their own defense expenditures.

The results from Panels 2 and 3 in Figure 1 suggest that existing alliance agreements between the US and a host-state generally influence how the host-state responds to troop deployments. Existing alliance ties suggest that the US has already established a hierarchical relationship with the host-state and may already be offering physical or economic security in exchange for influence over foreign policy decision-making in the host-state. Hence, the host-state may be less willing to give up additional sovereignty (i.e. reduce their defense burden) in exchange for troops. On the other hand, non-allies do not have an existing security relationship with the US, so the presence of US troops within their state may be the only avenue by which the US is establishing a security relationship with the host-state. Since the host-state did not previously concede sovereignty over

foreign policy to the US, the host-state may be willing to give up more sovereignty (i.e. reduce their defense burden) in exchange for troops. Basic summary statistics support this view. The mean defense burden for non-allied states in the pooled sample is approximately 3.1%, while it is only 1.3% for non-NATO US allies.

Next, Panel 3 in Figure 2 shows the results for NATO members, and these results provide support for Hypothesis 2. When the average size of regional deployments around NATO allies reaches about 4,000 troops, NATO allies increase their defense spending when the US places troops within their borders. Again, however, we see a threshold effect, as the magnitude of the marginal effect does not undergo a statistically significant change as the number of regional deployments increases. This result still provides support for Hypothesis 2.

\*\*\* Figure 2 about here \*\*\*

Next we examine the effect of  $\ln(\text{Troops Spatial Mean})$  on *Defense Burden*, given the size of Host-State Deployment Size. Overall, the results shown in Figure 3 provide support for Hypothesis 3, especially in regard to the non-NATO allies and non-allies models. Panel 1 shows the results for the most general model (Model 1). Here we can see that when the US troop presence in a state is small, the marginal effect of an increase in the average size of regional US deployments correlates with an increase in the state's defense burden. In other words, when a low degree of hierarchy characterizes the relationship between the US and the observed state, that state will respond to increasing US hierarchy throughout the region by increasing its own defense expenditures.

Next, the non-NATO allies and the non-allies models (Panels 2 and 4, respectively) both provide strong support for the argument that the nature of the relationship between the US and the host-state strongly influences how that state respond to increases in regional US troop deployments. Non-NATO allies hosting fewer than 30 US troops slightly increase their defense burden when the US increases troops deployments in their region. However, this effect is substantively small and quickly becomes statistically insignificant as the number of US troops the state hosts

increases. On the other hand, non-allies with less than approximately 3,000 US troops increase their defense burden as the US increases the size of its regional deployments. Unlike non-NATO allies, this effect only becomes statistically insignificant when the host-state's deployment is large (greater than 3,000).

The results from Figure 2 suggest that the relationship between the US and a state influences how that state responds to increases in regional troop deployments. Non-NATO allies may not view increases in regional troop deployments as a threat, and the positive effect of increases in regional deployments quickly disappears. However, since non-allies have no additional security ties to the US, they may be more concerned about their own security when the US increases troops in their region. As the US relationship with the host-state becomes increasingly hierarchical, and the state hosts a larger deployment of US troops, its status and security vis-à-vis the US is more secure.

Lastly, the results from the NATO allies model in Panel 3 of Figure 3 provides support for Hypothesis 4. When a NATO ally hosts more than 20 US troops, it increases its defense burden when the US increases regional deployments. This increase in spending grows as the number of troops within the host-state's border increases, likely reflecting the greater emphasis NATO states have places on burden sharing.

\*\*\* Figure 3 about here \*\*\*

With respect to the control variables, the results are mixed. More democratic countries spend less on defense than autocratic countries. However, the lack of significance in the NATO model (Model 3) likely reflects the relative lack of variation on the Polity variable in this particular subsample. Our conflict variables generally perform as expected. Countries experiencing a war or a civil war spend more on defense. MID involvement is also positively correlated with defense burden in Model 2 only, the non-NATO ally model. Most of the coefficients for the remaining control variables failed to attain statistical significance, or only reach relatively low levels of significance

in one model.

## Conclusions

The results of the preceding analysis provide strong support our hypotheses, indicating that the influence of US troop deployments on host-state defense spending is conditional upon the broader regional context of those deployments. States that host US troops, but remain isolated in this regard in their broader neighborhood, do not decrease their defense expenditures. However, as US deployments throughout the region increase in size, indicating that the US has increasingly hierarchical relationships with more states surrounding the host-state, the host-state will begin to shift resources away from defense, as we hypothesize. While this relationship holds in the pooled sample, it tends to characterize non-allied states of the US. While non-NATO allies also ultimately reduce their defense spending, this effect does not become statistically significant until the average size of regional troop deployments is large, and the resulting magnitude of the effect is small. We also find that NATO allies respond in the hypothesized manner, by increasing their defense expenditures in response to increases in the size of the US troop deployments they host. However, this positive effect is only observed when the average regional deployment is moderately large—approximately 3,000 troops.

The findings also provide important insights into how a state's hosting of US troops conditions its response to US deployments in the surrounding region. In our general model we find that states with relatively small deployments respond to increases in the average size of neighboring deployments by increasing their own defense expenditures. However, as the host-state's own deployment grows in size, this positive effect eventually disappears. As with the conditioning effect of regional deployments, the conditioning effect of host-state deployments is clearest for the non-allied subsample. We argue that this is indicative of states that do not share formal alliance ties with the US and that tend to be more wary of regional power buildups, since the deployment of US military forces alone does not necessarily come with explicit guarantees in terms of the conditions under

which the US will aid in securing the host-state. Alternatively, we again find that there is a similar, albeit significantly muted, effect for non-NATO allies. We take this as further evidence that the security guarantees embodied by an alliance agreement greatly augment the effect of US troop deployments on host-state defense spending. We also find that NATO members increase their defense spending in response to regional troop buildups, but only once the state itself hosts a small number of US military forces. Though NATO as a whole is an anarchic alliance structure (Lake 1996), individual states that host a large number of US troops—and are therefore in a more hierarchical relationship with the US—tend to respond to regional increases in US troop deployments by increasing their own defense burden. Again, we take this as confirming the idea that NATO states tend to follow the lead of the US in increasing defense spending. In this case, increasing regional troop deployments is indicative of increasing US contributions to the NATO alliance more broadly, thereby prompting host-states to increase their own contributions.

Our findings have broader theoretical and conceptual implications. As we discuss, existing work on hierarchy and contractual security relationships typically approach the subject through a dyadic framework, divorced from broader regional context. As scholars of regional security have noted, relations between a state and major powers constitute only a part of a state's security concerns (Frazier & Stewart-Ingersoll 2010). Drawing on theoretical insights from both theories of hierarchy and theories of regional security relationships, our analysis has demonstrated that regional context matters greatly in shaping how major powers like the US can use the provision of security to elicit policy concessions from states. Though our results generally confirm our theoretical expectations, we show that states hosting US troop deployments do not lower their defense burdens unconditionally. Rather, US security relationships in the broader region create an environment of mutually reinforcing hierarchical relationships, wherein individual states are more responsive to the US as its broader regional influence also grows.

These findings are important for current foreign policy developments as the United States considers reducing and reallocating its foreign commitments abroad. Targeting specific countries for



reductions will have dramatically different results than if the US pursued broad, regional reductions. Targeting states for deployment reductions may encourage the targeted state to spend more on their own military if the region already has a heavy US presence. However, reducing regional or targeted commitments to NATO countries may result in a reduction of defense commitments by both the state receiving the cuts as well as its neighbors.

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		State Deployment Size	
		Small	Large
Regional Deployment Size	Small	Low	Medium
	Large	Low	High

Figure 1: Basic theoretical expectations for conditional effect of regional troop deployments on host-state compliance. Cell contents indicate the level of compliance a state should be expected to demonstrate.

Table 1: US Troop Deployments and the Defense Burden, 1950-2003

	(1)	(2)	(3)	(4)
	All States	Non-NATO Allies	NATO Allies	Non-Allies
In (Troops)	-0.0001 (0.0010)	0.0004 (0.0005)	-0.0014** (0.0006)	-0.0009 (0.0014)
In (Troops Spatial Mean)	0.0050*** (0.0006)	0.0011*** (0.0004)	-0.0000 (0.0004)	0.0061*** (0.0007)
Troops * Spatial Mean	-0.0003*** (0.0001)	-0.0001** (0.0001)	0.0002*** (0.0001)	-0.0004*** (0.0001)
Spatial Ally Mean	0.0069** (0.0031)	-0.0086* (0.0046)	-0.0013 (0.0025)	0.0138*** (0.0042)
Spatial US Ally Mean	-0.0159*** (0.0049)	-0.0051 (0.0056)	0.0064*** (0.0023)	-0.0087 (0.0081)
Polity	-0.0009*** (0.0001)	-0.0002** (0.0001)	-0.0001 (0.0001)	-0.0014*** (0.0002)
Economic Growth	-0.0067 (0.0056)	-0.0023 (0.0038)	-0.0005 (0.0045)	-0.0073 (0.0061)
In (Total Population)	-0.0004 (0.0015)	0.0004 (0.0013)	0.0007 (0.0010)	-0.0003 (0.0017)
Infant Mortality Rate	-0.0000 (0.0000)	-0.0000 (0.0000)	0.0001** (0.0000)	-0.0001 (0.0000)
War	0.0130*** (0.0029)	0.0051** (0.0023)	0.0014 (0.0009)	0.0221*** (0.0056)
Civil War	0.0062** (0.0027)	0.0031*** (0.0012)	0.0007 (0.0009)	0.0077** (0.0036)
MIDs	0.0005 (0.0012)	0.0031*** (0.0011)	0.0005 (0.0004)	0.0009 (0.0016)
Threat Environment	0.0088 (0.0073)	-0.0044 (0.0124)	-0.0119 (0.0094)	0.0031 (0.0083)
#Border States	-0.0001 (0.0005)	0.0012 (0.0008)	0.0004** (0.0002)	-0.0008 (0.0007)
Constant	0.0115 (0.0145)	0.0126 (0.0178)	0.0133 (0.0155)	0.0126 (0.0162)
$R^2$	0.051	0.153	0.256	0.068
Prob > $\chi^2$	0.0000	0.0000	0.0000	0.0000
Observations	5901	1452	666	3783

Robust standard errors in parentheses.

\*  $p \leq 0.10$  \*\*  $p \leq 0.05$ , \*\*\*  $p \leq 0.01$

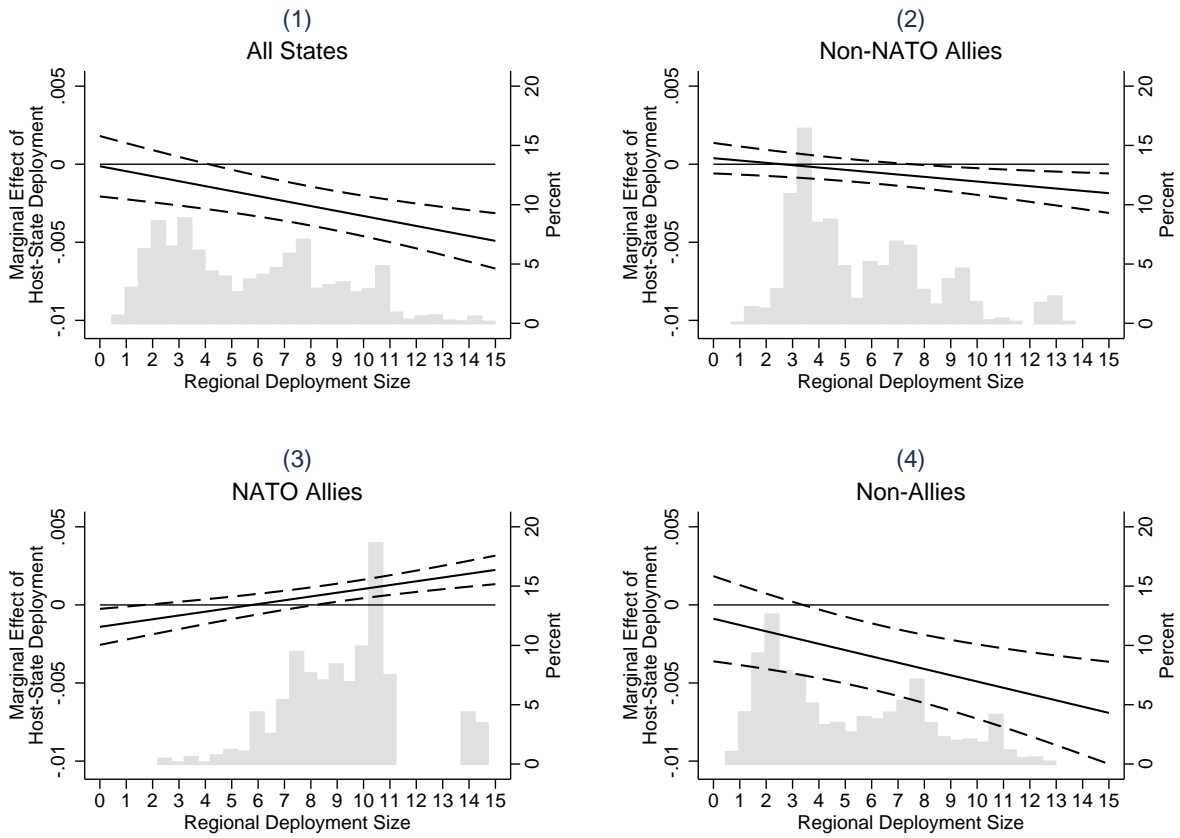


Figure 2: Marginal effect of an increase in the size of US troop deployments across the average size of regional deployments.

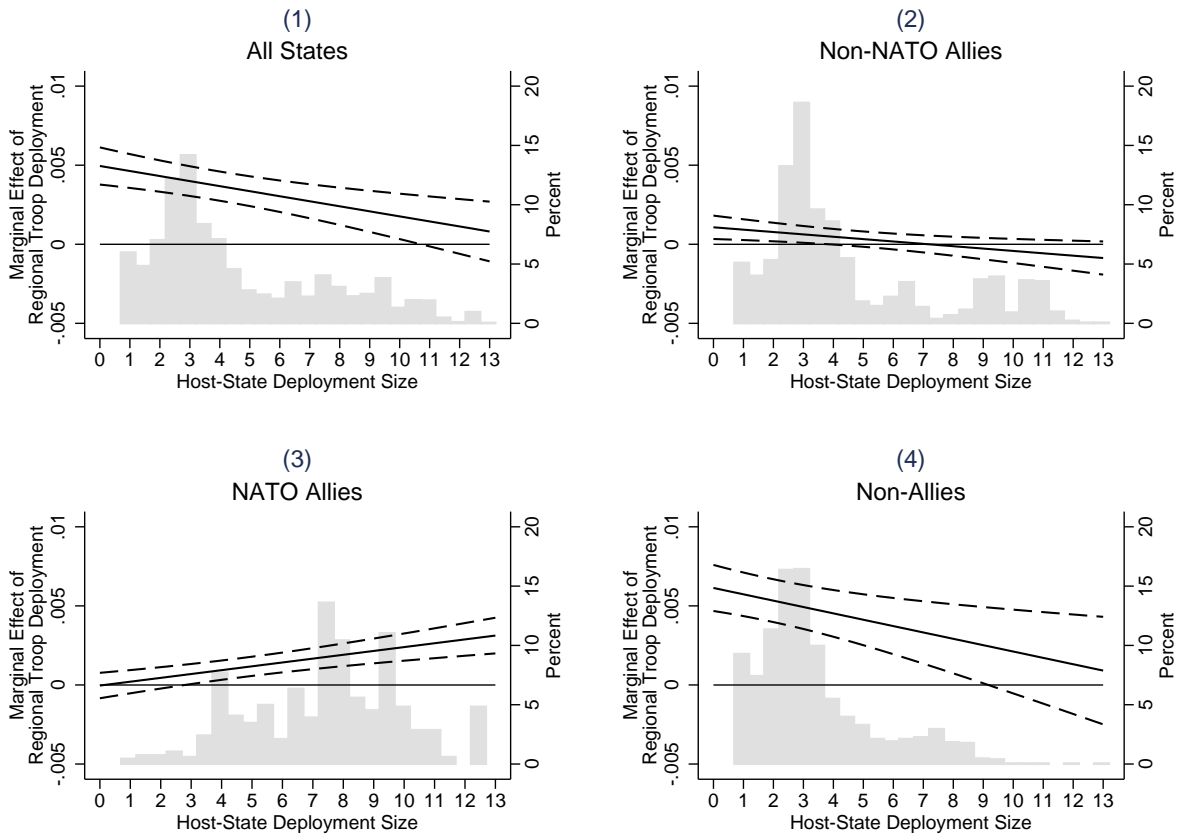


Figure 3: Marginal effect of an increase in the size of regional deployment across the size of the host-state's deployment size.