



# Estimating the Value of Overseas Security Commitments

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## Preface

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Since the 1940s, U.S. leadership of the international system has been justified, in part, by claims of a positive relationship between global stability and domestic prosperity. According to this argument, U.S. overseas security commitments that bolster stability in key regions of the world also generate economic benefits for the United States in the form of a stable international trading system that fosters growing trade in goods and services, unfettered access to global capital, and ultimately higher rates of economic growth at home. At the level of grand strategy, therefore, the nation's expenditures on overseas security commitments may be at least partly offset by these economic benefits. The logic of this claim has long been accepted by policymakers and many academics, yet in practice, the economic returns from overseas security commitments have proved extraordinarily difficult to measure empirically.

Today, there is intensifying debate over the resources devoted by the United States to its overseas commitments, with important voices calling for wholesale and unprecedented retrenchment in the face of mounting fiscal pressures. The question of whether and to what extent the United States derives economic benefits from its overseas security commitments is therefore increasingly salient.

In fiscal year 2013, the U.S. Air Force asked the RAND Corporation to study this issue using advanced econometric techniques and new data on overseas security commitments. This report codifies the results of that study. The research reported here was sponsored by Maj Gen Steven Kwast, Air Force Quadrennial Defense Review Office, Headquarters United States Air Force. It was conducted within the Strategy and Doctrine Program of RAND Project AIR FORCE.

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## Summary

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Since the 1940s, U.S. leadership of the international system has been justified, in part, by claims of a positive relationship between global stability and domestic prosperity. Advocates of this school of thought—the “engagement school”—argue that the political and military stability provided by the United States also fosters stability in the international economic system. Policymakers and many academics have long accepted the logic of this claim, yet in practice, the economic returns from overseas security commitments have proved extraordinarily difficult to measure empirically.

Pointing to this lack of empirical evidence, a growing school of thought—the “retrenchment school”—calls for a wholesale reduction of U.S. overseas security commitments. The retrenchment school contends that, rather than bolstering domestic prosperity, overseas commitments are exceedingly expensive to sustain, cause partner governments to free-ride on the U.S. defense budget while acting more belligerently toward potential adversaries, and fail to deliver the security and stability they are intended to create. The retrenchment school, therefore, advocates for reducing or eliminating those commitments. The latest major proposal for retrenchment has come from Barry Posen, the Ford International Professor of Political Science at the Massachusetts Institute of Technology. In his 2014 book, *Restraint: A New Foundation for U.S. Grand Strategy*, Posen offers detailed recommendations for an 80-percent reduction in U.S. security commitments and military presence in Europe, Africa, the Middle East, South Asia, and East Asia.

Although each of these schools of thought has typically drawn on qualitative evidence, both the engagement school and retrenchment school have empirical hypotheses amenable to quantitative analysis. In fact, because both schools deal with issues of cost and the economy, this debate calls for the use of quantitative data. We describe these hypotheses and then draw on the broad existing empirical trade and conflict literature to test each of them.

Our empirical analysis assesses the relationship between U.S. external security commitments—as measured by either troop numbers or the number of security-related treaties between the United States and partner governments—and U.S. bilateral trade, global bilateral trade, civil conflict, and trade costs. Our analysis of each of these four outcomes draws on empirical approaches and data from existing literature; we simply augment existing analyses with measures of security commitments. Although these commitments may in some cases influence the trade and conflict outcomes only indirectly—for example, the direct effect may be mediated through economic agreements associated with these security commitments—we are interested in capturing both the indirect and direct effects of security commitments, because the proposed retrenchments would negate both.

This work makes three novel contributions. First, rather than considering only a single outcome, we conduct a comprehensive analysis of a disparate range of outcomes, which allows us to test the full spectrum of hypotheses posited by the two schools of thought. As part of this comprehensive analysis, we examine the potentially distinct effects of country-specific security commitments versus regionally aggregated security commitments. Second, we utilize two new historical data sources on U.S. security commitments. The first is a database of the number of U.S. military personnel, disaggregated by service, assigned to each country. The second is a database of the number and types of U.S. security treaties signed with each country. Together, these historical databases allow us to explore whether troops from different services exhibit different effects and whether security-treaty relationships of different kinds also exhibit different effects. Third, based on the estimated effects, we provide estimates of the total economic value of these commitments.

In our analysis of aggregate U.S. bilateral trade, we find solid evidence that U.S. security commitments have significantly positive effects on U.S. bilateral trade. For example, our country-specific analysis indicates that a doubling of U.S. personnel commitments overseas could increase U.S. bilateral trade by as much as 15 percent, depending on the service, while a doubling of treaties could expand U.S. bilateral trade by 34 percent overall. Our country-specific results are driven by an expansive effect of U.S. security commitments on both exports and imports, suggesting that the U.S. overseas presence may improve stability at the country level. Although our analytical approach does not allow us to directly test how this presence influences net exports from the United States, our analysis suggests that security commitments are more likely creating a larger American market for foreign products than a larger export market for U.S. products. We find largely comparable results in the regional analysis of U.S. bilateral trade.

Both U.S. personnel and treaties also appear to have positive effects on overall global trade. Our estimates suggest that a doubling of personnel commitments could increase global trade by as much as 10 percent, and that doubling the number of treaties might expand global trade by more than 50 percent.

Our analysis of civil conflict provides no significant evidence that U.S. security commitments reduce either the prevalence or intensity of civil conflict. Thus, our analysis of conflict provides support for neither the engagement school, which suggests that these commitments should reduce conflict, nor the retrenchment school, which suggests that these commitments should increase conflict.

The final empirical test explores the relationship between security commitments and trade costs. Here, we find mixed evidence regarding country-specific security commitments. However, we find strong evidence that the regional security posture of the United States, in terms of personnel and treaties, reduces the trade costs of shipping by both air and water. Although we are unable to demonstrate that the relationship between reduced trade costs and the U.S. regional security posture is driven by the stabilizing role of the United States in any given region, the regional results are consistent with the engagement school's predictions.

Next, we conduct an analytic exercise to model the potential effects of a moderate version of the retrenchment school's leading policy proposal. Specifically, we consider the effects of a 50-percent reduction in U.S. overseas security commitments on trade and gross domestic product (GDP). Our estimates indicate that overseas U.S. bilateral trade in goods would fall by approximately 18 percent if overseas security commitments were reduced by 50 percent. Using 2015 nominal trade data, this would be equivalent to a loss in trade of both goods and services

of some \$577 billion per year. Using conservative estimates from the economics literature, we estimate that the resulting decline in U.S. GDP would be approximately \$490 billion per year.

Posen argues that his proposed 80-percent retrenchment in overseas commitments would allow the defense budget to shrink from 3.2 percent to 2.5 percent of U.S. GDP, which we estimate would lead to savings of \$126 billion per year. This number, like any such budget estimate, is subject to debate; indeed, other advocates of retrenchment report more-limited savings. Regardless, generous assumptions about the spending and tax multipliers associated with this reduction in government spending indicate that this estimated savings of \$126 billion could ultimately lead to a total increase in GDP of only as much as \$139 billion. The indirect costs are therefore likely to be much larger than any potential savings. Specifically, the conservatively estimated indirect costs of \$490 billion per year from just a 50-percent retrenchment are more than triple the estimated \$139-billion increase in GDP from the direct budgetary savings associated with an 80-percent retrenchment. Presumably, the savings from just a 50-percent retrenchment would be even lower than \$139 billion. This suggests that U.S. policymakers should proceed very carefully when considering large-scale retrenchments of overseas security commitments.

A number of weaknesses in this analysis can and should be addressed by future work. The main analytical challenge is differentiating between the causes and effects of U.S. security commitments. Did the commitments lead to growing trade, or did the expectations of growing trade lead to the increased commitments? We employ techniques for addressing this problem, called *endogeneity*, within the limits of the available data. New data sets might be developed that would allow for more-sophisticated approaches, called *identification strategies*, to deal with the endogeneity problem. This should be a priority for the analytic community.

Additionally, using current data, we can only very imprecisely measure U.S. security commitments. Our raw numbers of personnel—which we collect at one point in time each year—and our raw numbers of security-related agreements might not properly measure the depth or nature of the commitments. Better data can and should be developed.

A related data limitation is that this analysis is limited to physical trade. Some have argued that overseas security commitments may also have important implications for the financial sector, particularly international capital flows. This may also be a fruitful area of future research.

Further, while we find empirical evidence of different results across different types of troop deployments and security commitments, we are aware of no existing empirical research or theoretical guidance to interpret these differences. Additional analysis exploring these observed differences is warranted.

Finally, our partial equilibrium approach captures neither the potential long-term costs that this retrenchment might have on the U.S. economy through the suppression of global trade nor the potential long-term benefits to the U.S. economy from freeing up economic resources from these overseas commitments for other productive uses. While these long-term effects may be significant, and our estimates may therefore either understate or overstate the effects of reductions in U.S. security commitments, we do not anticipate that including these long-term effects would qualitatively alter our bottom-line conclusion that retrenchment would cost the U.S. economy much more than it would save. A general equilibrium analysis of retrenchment would nonetheless provide a more holistic view of the broader consequences of such a policy proposal.



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## Introduction

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Since the 1940s, U.S. leadership of the international system has been justified, in part, by claims of a positive relationship between global stability and domestic prosperity.<sup>1</sup> According to this argument, U.S. security commitments that bolster security and stability in key regions of the world also generate economic benefits for the United States through expanded trade in goods and services, access to global capital, and, ultimately, higher rates of economic growth.<sup>2</sup> At the level of grand strategy, therefore, the nation's expenditures on overseas commitments may be at least partly offset by these economic benefits. The logic of this claim has long been accepted by policymakers and many academics, yet in practice, the economic returns from overseas security commitments have proved extraordinarily difficult to measure empirically.<sup>3</sup>

Today, there is intensifying debate over the resources devoted by the United States to its overseas commitments, with important voices calling for wholesale and unprecedented retrenchment in the face of mounting fiscal pressures.<sup>4</sup> The question of whether and to what extent the United States derives economic benefits from its overseas security commitments is therefore increasingly salient. This report seeks to contribute to the debate by employing advanced econometric modeling techniques and new data sources to examine this enduring and important question.

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<sup>1</sup> See G. John Ikenberry, *Liberal Leviathan: The Origins, Crisis, and Transformation of the American World Order*, Princeton, N.J.: Princeton University Press, 2012. For an opposing viewpoint, see Christopher Layne, *The Peace of Illusions: American Grand Strategy from 1940 to the Present*, Ithaca, N.Y.: Cornell University Press, 2007.

<sup>2</sup> See Stephen G. Brooks, G. John Ikenberry, and William C. Wohlforth, "Don't Come Home America: The Case Against Retrenchment," *International Security*, Vol. 37, No. 3, Winter 2012/2013.

<sup>3</sup> Duncan Snidal, "The Limits of Hegemonic Stability Theory," *International Organization*, Vol. 39, No. 4, Autumn 1985; and Edward Spezio, "British Hegemony and Major Power War, 1815–1939: An Empirical Test of Gilin's Model of Hegemonic Governance," *International Studies Quarterly*, Vol. 34, No. 2, June 1990.

<sup>4</sup> A pair of articles in the January/February 2013 edition of *Foreign Affairs* provides an effective summary of this debate. See Barry Posen, "Pull Back: The Case for a Less Activist U.S. Foreign Policy," *Foreign Affairs*, January/February 2013; and Stephen G. Brooks, G. John Ikenberry, and William C. Wohlforth, "Lean Forward: In Defense of American Engagement," *Foreign Affairs*, January/February 2013.

## The Debate on Overseas Security Commitments

The United States has been the de facto leader of the international system since the mid-1940s.<sup>5</sup> Over the past seven decades, this extraordinary role has been underpinned by a remarkable degree of political and policy consensus that U.S. leadership is both necessary and desirable.<sup>6</sup> The 2015 National Security Strategy reflects this consensus:

We have an opportunity—and obligation—to lead the way in reinforcing, shaping, and where appropriate, creating the rules, norms, and institutions that are the foundation for peace, security, prosperity, and the protection of human rights in the 21st century. The modern-day international system currently relies heavily on an international legal architecture, economic and political institutions, as well as alliances and partnerships the United States and other like-minded nations established after World War II. Sustained by robust American leadership, this system has served us well for 70 years, facilitating international cooperation, burden sharing, and accountability. It carried us through the Cold War and ushered in a wave of democratization. It reduced barriers to trade, expanded free markets, and enabled advances in human dignity and prosperity.

But, the system has never been perfect, and aspects of it are increasingly challenged. We have seen too many cases where a failure to marshal the will and resources for collective action has led to inaction. The U.N. and other multilateral institutions are stressed by, among other things, resource demands, competing imperatives among member states, and the need for reform across a range of policy and administrative areas. Despite these undeniable strains, the vast majority of states do not want to replace the system we have. Rather, they look to America for the leadership needed to both fortify it and help it evolve to meet the wide range of challenges described throughout this strategy.<sup>7</sup>

America's leading role in the international system has important implications for defense strategy. The U.S. armed forces have the unique responsibility of, in the words of the 2014 Quadrennial Defense Review report, safeguarding the "U.S. security and that of our allies and partners; a strong economy in an open economic system; respect for universal values; and an international order that promotes peace, security, and opportunity through cooperation."<sup>8</sup> In effect, this means that the U.S. armed forces are the guarantors of stability in the most important regions of the international system, including North America, Europe, the Middle East, and Northeast Asia. They also play an important but narrower role in South America, North Africa, sub-Saharan Africa, Central Asia, and Southeast Asia.<sup>9</sup>

The essential ingredients of this guarantor role are the security commitments that the United States extends to partner nations. In practice, there is a spectrum of such commitments. At one end are states that have formal treaties that create reciprocal defense obligations,

<sup>5</sup> See for example, S. Nelson Drew, ed., *NSC-68: Forging the Strategy of Containment*, Washington, D.C.: National Defense University, 1996, Section IV.B.

<sup>6</sup> See Walter McDougal, *Promised Land, Crusader State: The American Encounter with the World Since 1776*, New York: Houghton Mifflin, 1997.

<sup>7</sup> White House, *National Security Strategy*, Washington, D.C., 2015, p. 23.

<sup>8</sup> U.S. Department of Defense, *Report of the Quadrennial Defense Review*, Washington, D.C., March 2014, p. 11.

<sup>9</sup> U.S. Department of Defense, *Defense Strategic Guidance*, Washington, D.C., 2012.



such as the North Atlantic Treaty. Often, these treaties are supplemented by dozens or hundreds of narrower functional agreements governing multilateral training and operations, collaborative research and development, status of forces, and other areas of practical cooperation. At the other end of the spectrum are states with less-salient commitments from the United States. Some of these states may be parties to large multilateral security treaties, such as the Rio Pact, but have few agreements with the United States on practical cooperation. Many nations in South America fall into this category of formal but limited commitments. Others, such as Djibouti, may possess an implicit security guarantee because they host large numbers of U.S. personnel. Between these two extremes are many nations with strong but informal commitments from the United States, often codified in a large number of agreements governing practical cooperation and the routine presence of U.S. personnel. Saudi Arabia exemplifies this type of relationship. Altogether, the United States has significant security commitments to approximately 140 nations, roughly half of which are highly formalized through treaty obligations.<sup>10</sup> Most nations in the contemporary international system can therefore be said to possess a security commitment, in one form or another, from the United States.

The presence of U.S. military personnel in partner nations, either permanently or episodically, is an important gauge of these commitments. On any given day, the United States has roughly 250,000 military personnel stationed or deployed in approximately 150 countries around the world.<sup>11</sup> In most countries, however, this presence is limited to very small numbers of U.S. Department of Defense personnel assigned to embassies for routine diplomatic duties. Roughly 50 countries host more than 25 U.S. personnel. Of those, perhaps 30 host U.S. operational units.<sup>12</sup>

In recent years, these overseas commitments have come under increasing scrutiny as the federal government's fiscal position has eroded. The Great Recession that began in 2008 resulted in a precipitous decline in federal revenue and a significant increase in social welfare spending for unemployment, income assistance, and related programs. The wars in Afghanistan and Iraq placed additional pressure on the nation's finances. The Congressional Budget Office reported that the ratio of federal debt to gross domestic product (GDP) was 74 percent by mid-2015, which is twice that of 2007 and the highest level since 1950.<sup>13</sup> The Congressional Budget Office projects that the debt-to-GDP ratio will exceed 100 percent in 2039, primarily because of increasing pressures on federal programs serving the aging baby boomer demographic.<sup>14</sup>

Repeated efforts to negotiate a long-term budget deal, or "grand bargain," to address these pressures have floundered on intractable disagreements over national priorities. In lieu of a deliberate fiscal strategy, the 2011 Budget Control Act imposed across-the-board cuts on

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<sup>10</sup> Jennifer Kavanagh, *U.S. Security-Related Agreements in Force Since 1955: Introducing a New Database*, Santa Monica, Calif.: RAND Corporation, RR-736-AF, 2014.

<sup>11</sup> Stacie L. Pettyjohn, *U.S. Global Defense Posture, 1783–2011*, Santa Monica, Calif.: RAND Corporation, MG-1244-AF, 2012.

<sup>12</sup> Defense Manpower Data Center, "Total Military Personnel and Dependent End Strength by Service, Regional Area, and Country," spreadsheet, December 31, 2014.

<sup>13</sup> Congressional Budget Office, *The 2015 Long-Term Budget Outlook*, Washington, D.C., June 16, 2014, p. 1.

<sup>14</sup> Congressional Budget Office, 2014, p. 11.

discretionary spending, including the defense budget, from 2011 to 2021. While the act has few defenders, no viable alternative has yet emerged.<sup>15</sup>

The Secretary of Defense has indicated that the current array of overseas security commitments cannot be maintained under the budget caps established in the Budget Control Act.<sup>16</sup> This has prompted a debate about whether the defense budget should be increased to sustain these commitments or, alternatively, the United States should retrench its commitments to reduce its defense burdens.<sup>17</sup> Given the essentially fiscal nature of this debate, the question of whether the United States derives economic, as well as security, benefits from its overseas commitments is of central importance.

The debate about whether and to what extent the United States derives economic benefits from its overseas security commitments can be divided into two schools of thought. The “engagement school” argues that the economic returns from overseas commitments are sufficiently large to weigh in the balance of the overall debate. The “retrenchment school” argues that they are negligible. We examine each in turn.

### The Engagement School

The engagement school argues that the United States derives important economic benefits from its overseas security commitments. Economic historian Kindleberger developed the seminal concept of “hegemonic stability” in his 1973 book *The World in Depression, 1929–1939*.<sup>18</sup> Kindleberger’s central argument was that the Great Depression occurred partly because Great

<sup>15</sup> Congressional Budget Office, *Options for Reducing the Deficit: 2014–2023*, Washington, D.C., November 2013.

<sup>16</sup> Ashton Carter, “Opening Summary: House Appropriations Committee—Defense Budget Request,” Washington, D.C., March 4, 2015.

<sup>17</sup> For the major works in this debate, see Ikenberry, 2012; Richard Fontaine and Kristin M. Lord, eds., *America’s Path: Grand Strategy for the Next Administration*, Washington, D.C.: Center for a New American Security, 2012; Charles P. Kupchan, *No One’s World: The West, the Rising Rest, and the Coming Global Turn*, Oxford, UK: Oxford University Press, 2013; Stephen G. Brooks and William C. Wohlforth, *World out of Balance: International Relations and the Challenge of American Primacy*, Princeton, N.J.: Princeton University Press, 2008; Robert J. Lieber, *Power and Willpower in the American Future: Why the United States Is Not Destined to Decline*, Cambridge, UK: Cambridge University Press, 2012; Robert J. Art, *A Grand Strategy for America*, Ithaca, N.Y.: Cornell University Press, 2013; Barry R. Posen, *Restraint: A New Foundation for U.S. Grand Strategy*, Ithaca, N.Y.: Cornell University Press, 2014; Michèle A. Flournoy and Shawn Brimley, eds., *Finding Our Way: Debating American Grand Strategy*, Washington, D.C.: Center for a New American Security, 2008; Barry R. Posen, “Stability and Change in U.S. Grand Strategy,” *Orbis*, Vol. 51, No. 4, October 2007; Stephen M. Walt, *Taming American Power: The Global Response to U.S. Primacy*, New York: W. W. Norton, 2006; Stephen M. Walt, “In the National Interest: A Grand New Strategy for American Foreign Policy,” *Boston Review*, Vol. 30, No. 1, February/March 2005; John J. Mearsheimer, “Imperial by Design,” *The National Interest*, No. 111, January/February 2011; Eugene Gholz and Daryl G. Press, “The Effects of Wars on Neutral Countries: Why It Doesn’t Pay to Preserve the Peace,” *Security Studies*, Vol. 10, No. 4, Summer 2001; Eugene Gholz, Daryl G. Press, and Harvey M. Sapolsky, “Come Home, America: The Strategy of Restraint in the Face of Temptation,” *International Security*, Vol. 21, No. 4, Spring 1997; Eugene Gholz and Daryl Press, “Footprints in the Sand,” *American Interest*, Vol. 5, No. 4, March/April 2010a; Eugene Gholz and Daryl G. Press, “Protecting ‘The Prize’: Oil and the U.S. National Interest,” *Security Studies*, Vol. 19, No. 3, August 2010b; Benjamin H. Friedman, Eugene Gholz, Daryl G. Press, and Harvey Sapolsky, “Restraining Order: For Strategic Modesty,” *World Affairs*, Fall 2009; Paul K. MacDonald and Joseph M. Parent, “Graceful Decline? The Surprising Success of Great Power Retrenchment,” *International Security*, Vol. 35, No. 4, Spring 2011; Christopher A. Preble, *Power Problem: How American Military Dominance Makes Us Less Safe, Less Prosperous, and Less Free*, Ithaca, N.Y.: Cornell University Press, 2009; Christopher Layne, “From Preponderance to Offshore Balancing: America’s Future Grand Strategy,” *International Security*, Vol. 22, No. 1, Summer 1997; Christopher Layne, “Offshore Balancing Revisited,” *Washington Quarterly*, Vol. 25, No. 2, Spring 2002; and Layne, 2007.

<sup>18</sup> Charles P. Kindleberger, *The World in Depression, 1929–1939*, Berkeley, Calif.: University of California Press, 1973. See also Charles P. Kindleberger, “Dominance and Leadership in the International Economy: Exploitation, Public Goods, and Free Rides,” *International Studies Quarterly*, Vol. 25, No. 2, June 1981.

Britain had lost the capacity to support the international trading system during a major systemic crisis and the United States, which potentially possessed this capacity, chose not to do so. The international system lacked a *hegemon*, or single leading state with the economic power to stabilize the system. Had the United States stepped forward to assert its hegemony, according to Kindleberger, the interwar period would have evolved very differently.

Kindleberger's concept of hegemonic stability concerned mostly the international economic system. His primary security-related insight was that the political and military stability provided by a hegemon also fostered stability in the international economic system. International relations academics soon expanded hegemonic stability theory to the political and security domains. Gilpin led the way in *The Political Economy of International Relations*, arguing that political leadership is necessary for the stability of the international economy.<sup>19</sup> Keohane and Ikenberry expanded the instrumentality of hegemony from the exercise of naked power to the construction of international institutions, regimes, and norms.<sup>20</sup>

Within this literature, Krasner broke new ground in theorizing the particular importance of security commitments by the hegemon.<sup>21</sup> An ambitious and more recent version of hegemonic stability theory was advanced by economists Findlay and O'Rourke in their 2007 volume *Power and Plenty: Trade, War, and the World Economy in the Second Millennium*. They conclude,

One of the lessons of history emphasized throughout this book is that the geopolitical context is crucial in determining the extent of international trade. Eurasian trade flows increased as a result of the *Pax Mongolica*, before diminishing again in the sixteenth century as a result of political turmoil; the comparatively peaceful nineteenth century saw unprecedented trade expansion; World War I, World War II, and the Cold War all had large, negative, long-run effects on trade. The most recent globalization upswing coincided with the end of the Cold War, and took place in a period in which warfare remained all too common, but tended to be national or regional, rather than global in scope.

The major condition for a continuation of present trends, therefore, is the avoidance of a major conflict dividing the world into competing camps.

. . . [P]eriods of sustained expansion in world trade have tended to coincide with the infrastructure of law and order necessary to keep trade routes open being provided by a dominant "hegemon" or imperial power, as in the cases of the *Pax Mongolica* and *Pax Britannica*. After 1945 this essential role was played by the United States, at least insofar as the non-Communist world was concerned. After the collapse of the Soviet Union and China's dramatic entry into

<sup>19</sup> Robert Gilpin, *The Political Economy of International Relations*, Princeton, N.J.: Princeton University Press, 1987. See also Robert Gilpin, *U.S. Power and the Multinational Corporation: The Political Economy of Foreign Direct Investment*, New York: Basic Books, 1975.

<sup>20</sup> Robert O. Keohane, *After Hegemony: Cooperation and Discord in the World Political Economy*, Princeton, N.J.: Princeton University Press, 1984; and G. John Ikenberry, *After Victory: Institutions, Strategic Restraint, and the Rebuilding of Order After Wars*, Princeton, N.J.: Princeton University Press, 2000. See also G. John Ikenberry, Michael Mastanduno, and William C. Wohlforth, eds., *International Relations and the Consequences of Unipolarity*, Cambridge, UK: Cambridge University Press, 2011; Brooks and Wohlforth, 2008; and Ikenberry, 2012.

<sup>21</sup> Stephen Krasner, "State Power and the Structure of International Trade," *World Politics*, Vol. 28, No. 3, April 1976; and Michael C. Webb and Stephen D. Krasner, "Hegemonic Stability Theory: An Empirical Assessment," *Review of International Studies*, Vol. 15, Special Issue No. 2, April 1989. See discussion in Robert O. Keohane, "Problematic Lucidity: Stephen Krasner's 'State Power and the Structure of International Trade,'" *World Politics*, Vol. 50, No. 1, October 1997.

the world market, however, the question is open as to whether the *Pax Americana* can continue effectively in what is now an almost wholly globalized world economic system.<sup>22</sup>

For many in the engagement school, this history holds clear lessons for U.S. policymakers as they confront today's security challenges and fiscal pressures. The leading engagement advocates in the policy domain, Brooks, Ikenberry, and Wohlforth, argue,

Military Dominance, Economic Preeminence: Preoccupied with security issues, critics of the current grand strategy miss one of its most important benefits: sustaining an open global economy and a favorable place for the United States within it. To be sure, the sheer size of its output would guarantee the United States a major role in the global economy whatever grand strategy it adopted. Yet the country's military dominance undergirds its economic leadership. In addition to protecting the world economy from instability, its military commitments and naval superiority help secure the sea-lanes and other shipping corridors that allow trade to flow freely and cheaply. Were the United States to pull back from the world, the task of securing the global commons would get much harder. Washington would have less leverage with which it could convince countries to cooperate on economic matters and less access to the military bases throughout the world needed to keep the seas open.<sup>23</sup>

Indeed, some advocates of engagement even argue that the economic benefits of U.S. security commitments exceed the cost of sustaining them. In the words of Kagan, a prominent advocate of engagement,

Those who support cutting the defense budget think that if the United States would simply scale back its role in the world, it could save money and make raising further revenue unnecessary. This is a faulty assumption. The present global economic and political order, which has provided the environment in which the United States has grown and prospered for decades, is built on and around American power and influence. Were the United States to cease playing its role in upholding this order, were we to retreat from East Asia or to back away from the challenge posed by a nuclear Iran, the result could only be global instability. From a purely economic perspective, it would be far more costly to restore order and stability—both essential to a prosperous global economy—than it would be to sustain it.<sup>24</sup>

Members of the engagement school have developed several causal hypotheses to explain how a hegemon's security commitments lead to an expansion of international trade. There are many subtle differences among these hypotheses, but for our purposes, they can be grouped into three broad theories: hegemonic public goods, hegemonic reassurance, and hegemonic influence.<sup>25</sup> Below, we examine each theory in turn.

<sup>22</sup> Ronald Findlay and Kevin H. O'Rourke, *Power and Plenty: Trade, War, and the World Economy in the Second Millennium*, Princeton, N.J.: Princeton University Press, 2007, pp. 539–540. *Pax Mongolica* refers to the period in the thirteenth and fourteenth centuries during which the Mongol Empire conquered and stabilized much of Eurasia; *Pax Britannica* refers to the period of peace between 1815 and World War II, during which Great Britain was a hegemonic power; and *Pax Americana* refers to the peace enjoyed in the West as a result of U.S. power after World War II and continuing today.

<sup>23</sup> Brooks, Ikenberry, and Wohlforth, 2013, p. 135.

<sup>24</sup> Robert Kagan, "The Fiscal Crisis Puts National Security at Risk," *Washington Post*, November 12, 2012.

<sup>25</sup> Advocates also have developed theories that link security commitments to international capital flows and the establishment of the hegemon's currency as the reserve currency for the system. Our analysis focuses on trade flows, so we exclude this theory from further consideration in this document.

### **Theory 1: Hegemonic Public Goods**

Kindleberger's original argument remains important. He characterized international stability as a "public good" that is expensive to create, benefits all states in the international system, and cannot be denied to any state once it has been created. In the absence of a hegemon, states will therefore tend to underinvest in the stability of the international system because of incentives to free-ride off the stability created by others. Hegemons resolve this problem by taking responsibility for maintaining the stability of the system and suppressing possible conflicts. The result is a more stable international security system and a concomitantly more stable international economic system. Stability fosters greater international trade, because individuals and firms need not be concerned that their commerce will be intercepted or destroyed by belligerents. The hegemon's security commitments therefore reduce what today we would call geopolitical risk for those involved in international trade.<sup>26</sup>

The causal chain linking overseas security commitments to increased trade for the United States would be relatively straightforward (Figure 1.1).

All else being equal, according to the theory, increased overseas security commitments should reduce instability and conflict, which will allow greater trade to occur than otherwise would have been the case. Some portion of this trade will directly or indirectly involve the United States. This is most likely to be manifested at the regional level, where an increased number of security-related agreements between the hegemon and partner states in the region, or an increased number of the hegemon's forces in the region, should be associated with greater stability. The converse should also be true: Fewer or less-intense security commitments by the hegemon should correlate with an increase in instability and conflict, which would allow less trade to occur.

Notably, there are now two prominent versions of hegemonic public goods theory. One version focuses on the level of regional conflict as the potential hindrance to trade. If the hegemon's security commitments drive down the number and intensity of conflicts in a region, this should support greater trade. The second version focuses more specifically on the security of trade routes and lines of communication. If the hegemon's security commitments reduce threats to trade routes, this should support greater trade irrespective of those commitments' effect on overall levels of regional conflict.

### **Theory 2: Hegemonic Reassurance**

The second major strand of hegemonic stability theory made its debut in Krasner's influential article, "State Power and the Structure of International Trade."<sup>27</sup> Krasner argues that when the leader of the international system makes security commitments to a partner state, the partner is reassured about its security and therefore more likely to allow its individuals and firms to

**Figure 1.1**  
**Theory of Hegemonic Public Goods**



RAND RR518-1.1

<sup>26</sup> Gilpin, 1987, p. 31.

<sup>27</sup> Krasner, 1976.

trade with those in other countries. Prior to the commitment, the partner might have been constrained by concerns about the relative gains of trade: If a trading relationship might make a potential adversary country more wealthy, over the long run, the relationship could harm the partner's security. The natural response would be to restrict trade. With the hegemon's reassuring security commitment, however, the partner state is free to allow individuals and firms to engage in trade on the basis of absolute gains, regardless of relative gains. This should tend to result in greater trade, particularly between states where political antagonism might have otherwise restricted trade.

The causal chain for hegemonic reassurance is straightforward and hinges again on the effect of security commitments on uncertainty, this time at the state level rather than the individual or firm level (Figure 1.2).

According to hegemonic reassurance theory, all else being equal, an increase in the hegemon's overseas security commitments should reduce partner concerns about the relative gains of trade, which will cause the partner to allow greater trade, both with the hegemon and with other countries, to occur than otherwise would have been the case. Some of this greater volume of trade will make its way indirectly back to the hegemon. The converse should also be true: Decreased overseas security commitments by the hegemon should increase partner concerns about the relative gains to trade, which will allow less trade to occur. This effect should be strongest at the periphery of the international system, where partner states confront comparatively greater uncertainty about political stability and the intentions of neighboring states, and it should mostly affect the existence of trading relationships between two states rather than its aggregate volume.

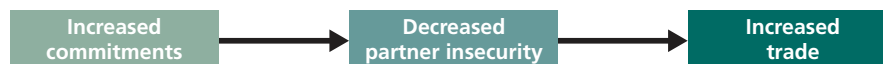
### **Theory 3: Hegemonic Influence**

The third major strand of hegemonic stability theory is also associated with Krasner. As a complement to the theory of hegemonic reassurance, Krasner argues that when the leader of the international system makes security commitments to individual partner states, the hegemon also gains some degree of influence over the partner's trade policy. This allows the hegemon to press the partner to reduce its restrictions on trade and more fully participate in the open international trading system overseen by the hegemon. Some of this additional trade would directly or indirectly make its way to the hegemon. Prior to the commitment, the partner states may have had both motive and means to suppress trade. Security commitments with the hegemon will tend to mitigate both.

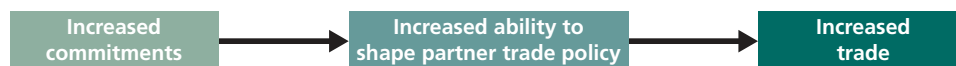
The causal chain for hegemonic influence hinges on the ability of the hegemon to coerce the partner to adhere to the rules of an open trading system (Figure 1.3).

All else being equal, according to hegemonic influence theory, an increase in the hegemon's overseas security commitments should boost the hegemon's ability to coerce the partner to adopt open trading policies, which will cause the partner to allow greater trade to occur than otherwise would have been the case. The converse should also be true: Decreased overseas security commitments should decrease the hegemon's ability to influence partner trade

**Figure 1.2**  
**Theory of Hegemonic Reassurance**



**Figure 1.3**  
**Theory of Hegemonic Influence**



RAND RR518-1.3

policies, which will allow less trade to occur. Like hegemonic reassurance, this effect should be strongest at the periphery of the international system, where partner states confront comparatively greater uncertainty about their neighbors and therefore greater incentives to impose trade restrictions as the hegemon's influence wanes.

### The Retrenchment School

The retrenchment school argues that the costs of U.S. leadership are very high and the benefits low or nonexistent. The United States should therefore save money on defense by fundamentally retrenching its overseas security commitments. This school draws primarily from the ranks of international relations academics, libertarian think tanks, and some libertarian or conservative political figures, such as Sen. Rand Paul. Advocates of retrenchment argue that the security benefits of American leadership are overestimated by policymakers and that overseas commitments may indeed be counterproductive because they trigger anti-American sentiment, provoke other powers, and allow allies to free-ride off the United States.<sup>28</sup>

Advocates of retrenchment have responses to each of the theories advanced by the engagement school. The most serious overarching argument is that all three engagement-school theories rely too heavily on a small number of historical cases, primarily *Pax Britannica* and *Pax Americana*, and large-scale statistical analyses have failed to detect the correlations posited by the theories.<sup>29</sup> As Posen has argued in the most recent major volume in the retrenchment school,

Finally, testing of narrow versions of the [hegemonic stability] theory did not show compelling results. . . . [I]f there is a gain to having a global hegemon, we do not know its magnitude, and we do not know whether the gains to the United States are commensurate with the costs to the United States. I argue they are not.<sup>30</sup>

Second, advocates of retrenchment suggest that a global hegemon is not necessary or sufficient to the existence of an international trading system. They observe that international trade has occurred in periods in which there was no global hegemon and that a hegemon alone is not sufficient to create an international trading system by itself. These amount to arguments that the potential effect of hegemonic stability occurs at the margins, perhaps increasing trade but not explaining all of trade.<sup>31</sup>

<sup>28</sup> Layne, 2007.

<sup>29</sup> Snidal, 1985; Spezio, 1990.

<sup>30</sup> Posen, 2014, p. 62.

<sup>31</sup> Posen, 2014, p. 63; Daniel Drezner, "Military Primacy Doesn't Pay (as Much as You Think)," *International Security*, Vol. 38, No. 1, Summer 2013, p. 78.

Third, advocates of retrenchment argue that hegemonic reassurance and hegemonic influence are both more powerful in bipolar international systems. Drezner cites anecdotal cases in which the United States has lacked the capability to reassure or coerce security partners into changing their trade policies.<sup>32</sup>

Fourth, advocates of retrenchment also argue that hegemonic reassurance and hegemonic influence conflate security hegemony with economic hegemony. According to this argument, both theories operate more through economic instruments of coercion rather than security commitments. In their view, the ability of the hegemon to reassure or coerce partner governments should track the degree of the hegemon's economic dominance rather than its level of security commitments.<sup>33</sup>

### **Test Case: Posen's Strategy for Implementing Retrenchment**

In 2014, Posen, the leading academic in the retrenchment school, published a book-length volume outlining a defense strategy consistent with retrenchment's core arguments. Posen's book *Restraint: A New Foundation for U.S. Grand Strategy* engages the theoretical debate at length and, more importantly, contains the most detailed description yet of what the retrenchment school advocates: a different defense strategy.

Posen argues that U.S. overseas security commitments fail to deliver the security and stability they are intended to create.<sup>34</sup> They do so, in part, by causing partner governments to free-ride off the U.S. defense budget and act more belligerently toward potential adversaries. Most importantly, however, the underlying theme of Posen's volume is that the United States is devoting an enormous amount of national wealth to the military capabilities required to sustain its overseas commitments and that, given increasing fiscal pressures, these resources should be reallocated to other national objectives.<sup>35</sup>

Posen advocates a wholesale reduction in overseas security commitments. He recommends completely vitiating U.S. security commitments to all European nations, reducing the North Atlantic Treaty Organization to a political organization, and withdrawing all U.S. forces from the continent.<sup>36</sup> In the Middle East, Posen argues that U.S. security commitments should be renegotiated to stipulate that the United States has no stake in the internal stability of regimes. Its only concern is to prevent a single state from asserting control over all the region's oil reserves. As a result, he advocates that the United States remove its operational presence from Persian Gulf countries.<sup>37</sup> Posen calls for the U.S. security commitment with Israel to return to its pre-1967 status, which is neutrality, and for all security assistance to Israel to be phased out.<sup>38</sup>

In Asia, Posen favors a complete withdrawal by the United States and the development of a Japanese nuclear deterrent.<sup>39</sup> He recommends an interim period marked by renegotiating the

<sup>32</sup> Drezner, 2013, p. 54.

<sup>33</sup> Drezner, 2013, p. 73.

<sup>34</sup> Posen, 2014, Chapter 1.

<sup>35</sup> Posen, 2014, p. xii.

<sup>36</sup> Posen, 2014, pp. 89–90.

<sup>37</sup> Posen, 2014, pp. 107–113. Specifically, Posen states, “The United States should cut its shore presence in the gulf to the lowest possible level” (p. 113).

<sup>38</sup> Posen, 2014, p. 119.

<sup>39</sup> Posen, 2014, p. 101.



Treaty of Mutual Cooperation and Security Between the United States and Japan to induce Japan to invest more in its own defenses, as well as withdrawing “significant numbers” but not necessarily all U.S. forces immediately.<sup>40</sup> Posen also calls, in effect, for abrogating the security commitment to Taiwan, which he describes as “simultaneously the most perilous and the least strategically necessary commitment that the United States has today.”<sup>41</sup> Furthermore, he calls for the United States to withdraw its forces from Korea and vitiate that security commitment.<sup>42</sup> In Central Asia, Posen calls for abandoning the commitment to the Afghan government and shifting support to Northern Alliance warlords.<sup>43</sup>

The new defense strategy that Posen outlines is the most concrete blueprint available for the defense strategy of retrenchment. While some details remain opaque, such as the number of personnel who would remain in Japan after retrenchment, it is possible to develop a general sense of the quantitative scale of retrenchment he recommends. If we assume that 35,000 Navy and Marine Corps personnel remain in Japan, the presence in the Middle East is reduced to 5,000 Navy and Marine Corps personnel, and 6,000 personnel remain in “other” locations as reported by the U.S. Department of Defense (we assume many of these are aboard ships at sea), then the net reduction of U.S. overseas presence would be slightly more than 80 percent.

In terms of agreements, Posen calls for the abrogation of security commitments to 52 of the 68 countries with which the United States has formal security commitments. Of the remaining 16 states, most are in the Middle East, where Posen calls for a functional renegotiation of security commitments to address external threats only. The net effect of implementing Posen’s strategy would be a reduction of U.S. security-related agreements with other nations of at least 80 percent.

Posen estimates that the force structure required to support this reduced set of commitments could be sustained with a defense budget equivalent to 2.5 percent of GDP. Although he offers no details, and such estimates are fraught with uncertainty, this does allow us to place a rough estimate on the amount of money Posen feels can be saved under the new strategy. The Congressional Budget Office estimates the current base defense budget to be 3.2 percent of GDP.<sup>44</sup> A defense budget of 2.5 percent would therefore represent savings of 0.7 percent of GDP, or approximately \$126 billion per year.<sup>45</sup> A similar study by analysts at the Cato Institute suggested savings of \$40 billion per year.<sup>46</sup> The most comparable RAND studies suggest that closing all U.S. bases overseas, without any reductions in overall personnel, would save only \$9 billion per year.<sup>47</sup>

<sup>40</sup> Posen, 2014, p. 100.

<sup>41</sup> Posen, 2014, p. 102.

<sup>42</sup> Posen, 2014, p. 105.

<sup>43</sup> Posen, 2014, p. 128.

<sup>44</sup> Congressional Budget Office, *Updated Budget Projections: 2015 to 2025*, Washington, D.C., March 9, 2015, p. 6.

<sup>45</sup> The estimate is based on the Congressional Budget Office’s estimate of 2015 U.S. GDP of \$18 trillion (Congressional Budget Office, 2015, p. 2).

<sup>46</sup> Friedman and Logan (p. 187) estimate that approximately \$400 billion could be saved over ten years. Benjamin H. Friedman and Justin Logan, “Why the U.S. Military Budget Is ‘Foolish and Sustainable,’” *Orbis*, Vol. 56, No. 2, Spring 2012.

<sup>47</sup> Patrick Mills, Adam R. Grissom, Jennifer Kavanagh, Leila Mahnad, and Stephen M. Worman, *A Cost Analysis of the U.S. Air Force Overseas Posture: Informing Strategic Choices*, Santa Monica, Calif.: RAND Corporation, RR-150-AF, 2013; Michael J. Lostumbo, Michael J. McNerney, Eric Peltz, Derek Eaton, David R. Frelinger, Victoria A. Greenfield, John Hal-

## Empirical Predictions of the Different Theoretical Perspectives

This review of the theoretical literature reveals several existing, largely untested, empirical predictions on the relationship between U.S. external security commitments and both economic and security outcomes. In this section, we review these different empirical predictions, which will be the focus of the empirical work throughout the rest of this document. In the subsequent section, we describe the empirical methods that we use for testing these.

Our discussion of the *engagement school* was divided into three theories—(1) hegemonic public goods (HPG), (2) hegemonic reassurance (HR), and (3) hegemonic influence (HI). As seen earlier, these theories are closely linked. Thus, rather than test the veracity of each theory separately, we aggregate their empirical hypotheses into a unified list that we shall use to test the veracity of the engagement school. These hypotheses, which are specified as tests of the United States' potential role as the hegemon, are as follows (and the relevant theory leading to that hypothesis is provided in parentheses):

- **Hypothesis E1:** Commitments should *drive down the number and intensity of conflicts* (HPG).
- **Hypothesis E2:** Commitments should *reduce trade costs* (HPG).
- **Hypothesis E3:** Commitments should *increase global trade*—both bilateral trade involving the hegemon and global trade more broadly (HPG, HI).
- **Hypothesis E4:** Benefit will be *greatest in places where political antagonism had previously retarded trade* (HR).
- **Hypothesis E5:** Commitments should *increase U.S. bilateral trade* (HPG, HR, HI).

The general view of the *retrenchment school* is that (1) a global hegemon is neither necessary nor sufficient for international trade and (2) U.S. security commitments create a negative externality in that they encourage partners of the hegemon to behave more belligerently than they would otherwise. The overall view of this school of thought can therefore be distilled into the following three hypotheses:

- **Hypothesis R1:** Commitments *increase the number and intensity of conflicts*.
- **Hypothesis R2:** Commitments have *limited effect on both global and U.S. bilateral trade*.
- **Hypothesis R3:** Any potential benefit of commitments *should have been attenuated by the collapse of the bipolar international system in 1989*.

An additional component of the retrenchment school's criticism, which is a concern that we must address in our own empirical work, is that analyses of the effect of security hegemony conflate economic hegemony and security hegemony. This is equivalent to arguing that any analysis of the effect of U.S. security commitments on economic outcomes must overcome a core endogeneity problem—specifically, whether the United States creates security commitments with countries with which it believes it will have economically beneficial trading relationships, or whether the economically beneficial relationships follow from the security

commitments. Our approach for dealing with this potential endogeneity concern is introduced briefly in the following section and then discussed in depth in Chapter Three.

Our empirical work, which is summarized in the following section and is the focus of the rest of this report, tests seven of these eight hypotheses. Specifically, we are able to combine two data sets of U.S. security commitments—measuring, respectively, the number of security treaty relationships and the number of deployed personnel, by service—with a diversity of existing data and empirical techniques in testing hypotheses E1–E5 and R1–R2. Although R3 also provides a testable hypothesis, there has been limited variation in security commitments since 1989, making any statistical estimates unreliable.

## Overview of Empirical Analysis

Our empirical work uses cross-country regressions in order to test the eight hypotheses specified above. This analysis relies on four types of available historical data—U.S. bilateral trade, global bilateral trade, global stability, and trade costs—each of which provides unique insight into testing these hypotheses. In each case, the cross-country regressions explore how changes in the depth of U.S. security commitments, measured as the number of troops or security treaties, are related to changes in each of these four variables over time.

In analyzing each of the four types of historical data, we rely on the empirical approaches developed within that specific literature. In each case, we keep our setup and empirical specifications as close to the original as possible to enhance comparability of our work to previous work.

### U.S. Bilateral Trade

There is now a robust literature exploring the relationship between U.S. external security commitments and U.S. bilateral trade. Early contributions provided evidence that “trade followed the flag” in illustrating the positive correlation between U.S. diplomatic coordination and trade.<sup>48</sup> A subsequent literature debated the direction of this causality, trying to identify whether diplomatic coordination or conflict affected trade directly or whether the direction of causality was in the other direction.<sup>49</sup>

More-recent contributions to this literature have explored other specifications of U.S. security commitments. Biglaiser and DeRouen analyze the possible relationship between U.S. troop deployment numbers and U.S. bilateral trade with developing countries.<sup>50</sup> They report a reciprocal relationship between U.S. troop deployment and trade, in that the presence of troops increases trade with the United States, while the presence of trade increases troop deployments. Berger and colleagues similarly examine the potential role of Central Intelligence

<sup>48</sup> See, for example, M. Brian Pollins, “Does Trade Still Follow the Flag?” *American Political Science Review*, Vol. 83, No. 2, June 1989. These early contributors developed a measure of diplomatic coordination based on the number of “cooperative” and “hostile” messages reported in the Cooperation and Peace Data Bank (Pollins, 1989).

<sup>49</sup> For example, Omar Keshk, Brian Pollins, and Rafael Reuveny, “Trade Still Follows the Flag: The Primacy of Politics in a Simultaneous Model of Interdependence and Armed Conflict,” *The Journal of Politics*, Vol. 66, No. 4, November 2004; and Bruce Russett and John R. Oneal, *Triangulating Peace: Democracy, Interdependence, and International Organizations*, New York: W. W. Norton & Company, 2001.

<sup>50</sup> Glen Biglaiser and Karl DeRouen, “Economics and Security: The Interdependence of U.S. Troops and Trade in the Developing World,” *Foreign Policy Analysis*, Vol. 5, 2009.

Agency (CIA) interventionism on U.S. bilateral trade, focusing particularly on whether CIA interventionism expanded markets for U.S. exports.<sup>51</sup>

Our empirical analysis of U.S. bilateral trade follows this existing work closely. In Chapter Four, our analysis of overall U.S. bilateral trade is in the spirit of Pollins and of Biglaiser and DeRouen.<sup>52</sup> Indeed, because one of the 12 measures of U.S. security commitments that we consider is the total number of U.S. troops, our empirical analysis is particularly close to Biglaiser and DeRouen's.<sup>53</sup>

The major difference between our approach and these previous approaches is threefold. First, we use a gravity model for trade, following Glick and Taylor, in exploring the effect of U.S. security commitments.<sup>54</sup> This approach, now the workhorse of the empirical global trade literature, models trade between two nations as a function of the logarithm (log)—usually as a function of the natural logarithm (ln)—of the product of their GDPs and other control variables. Second, we disaggregate the troop numbers by service and include nine different measures of treaty relationships.<sup>55</sup> Third, we calculate back-of-the-envelope estimates of the total value of these commitments.

Our second analysis of U.S. bilateral trade, which disaggregates trade into imports and exports, follows the approach and intuition of Berger and colleagues.<sup>56</sup> Here, our major difference is the focus on how the persistent presence of U.S. security institutions—both troops and treaties—affects imports versus exports as opposed to the event-based analytical approach exploring U.S. unexpected interventionism (e.g., by the CIA).

### Global Bilateral Trade

The relationship between security and global bilateral trade also has been explored in a now-rich empirical literature. Most of this literature has focused on assessing the relationship between global bilateral trade and either conflict or insecurity, more broadly defined. The empirical literature examining the effect of conflict has provided conflicting evidence, with some prominent studies demonstrating that trade is reduced during periods of conflict between nations,<sup>57</sup> while others suggest that war does not have a significant effect on individual trading relationships.<sup>58</sup>

<sup>51</sup> Daniel Berger, William Easterly, Nathan Nunn, and Shanker Satyanath, "Commercial Imperialism? Political Influence and Trade During the Cold War," *American Economic Review*, Vol. 103, No. 2, April 2013.

<sup>52</sup> Pollins, 1989; Biglaiser and DeRouen, 2009.

<sup>53</sup> Biglaiser and DeRouen, 2009.

<sup>54</sup> Reuven Glick and Alan M. Taylor, "Collateral Damage: Trade Disruption and the Economic Impact of War," *The Review of Economics and Statistics*, Vol. 92, No. 1, February 2010.

<sup>55</sup> Note that Biglaiser and DeRouen provide an alternative specification of security commitments in exploring foreign direct investment, which relies on the similarity of a country's commitments to that of the United States (Glen Biglaiser and Karl DeRouen, "Following the Flag: Troop Deployment and US Foreign Direct Investment," *International Studies Quarterly*, Vol. 51, No. 4, 2007). Li and Vashchilko also assess the effect of security commitments on bilateral flows of foreign direct investment (Quan Li and Tatiana Vashchilko, "Dyadic Military Conflict, Security Alliances, and Bilateral FDI Flows," *Journal of International Business Studies*, Vol. 41, 2010).

<sup>56</sup> Berger et al., 2013.

<sup>57</sup> See, for example, Edward D. Mansfield, *Power, Trade, and War*, Princeton, N.J.: Princeton University Press, 1994; and Charles H. Anderton and John R. Carter, "The Impact of War on Trade: An Interrupted Times-Series Study," *Journal of Peace Research*, Vol. 38, No. 4, July 2001.

<sup>58</sup> See, for example, Katherine Barbieri and Jack S. Levy, "Sleeping with the Enemy: The Impact of War on Trade," *Journal of Peace Research*, Vol. 36, No. 4, 1999.

Insecurity in international exchange, more broadly defined, has been offered as an explanation for why the actual volume of trade is below that predicted by most economic models.<sup>59</sup>

Our empirical analysis follows a more recent literature that has focused on using gravity models of trade to explore the relationship between security and global bilateral trade.<sup>60</sup> As examples, Blomberg and Hess model aggregate trade as a function of four different types of insecurity—terrorism, external conflict, revolutions, and interethnic fighting—finding that “the presence of terrorism together with internal and external conflict is equivalent to as much as a 30 percent tariff on trade.”<sup>61</sup> Glick and Taylor explore the effects of total war on aggregate trade among both combatants and nonparticipants (e.g., neutral parties) and find “large and persistent impacts of wars on trade, on national income, and on global economic welfare”; these authors conclude that the indirect (economic) costs of war might be “at least as large as the conventionally measured ‘direct’ costs of war.”<sup>62</sup> Martin, Mayer, and Thoenig provide an analogous analysis of the effects of civil war on international trade flows.<sup>63</sup>

We follow Glick and Taylor closely in our analysis.<sup>64</sup> Indeed, we use their publicly provided data and simply augment that data with our additional measures of U.S. external security commitments to explore the effect of U.S. troops and treaty commitments and the flows of bilateral trade.

### Global Stability

There is also a broad empirical literature examining how economic, political, geographic, and social factors influence the onset or likelihood of instability or conflict. These empirical analyses typically rely on cross-country regression approaches to study the incidence or onset of conflict.<sup>65</sup> Similar approaches have been used to study the severity of civil conflicts using the civil conflicts themselves as the unit of analysis.<sup>66</sup>

Our analysis builds on this quantitative cross-country regression literature in assessing the potential effect of U.S. external security commitments on country-specific instability.

<sup>59</sup> See, for example, James E. Anderson and Douglas Marcouiller, “Trade and Security, I: Anarchy,” NBER Working Paper No. 6223, October 1998; and James E. Anderson and Douglas Marcouiller, “Insecurity and the Pattern of Trade: An Empirical Investigation,” *The Review of Economics and Statistics*, Vol. 84, No. 2, May 2002.

<sup>60</sup> This form of the gravity model has become a standard in the trade literature (e.g., James E. Anderson, “A Theoretical Foundation for the Gravity Equation,” *American Economic Review*, Vol. 69, No. 1, March 1979).

<sup>61</sup> S. Brock Blomberg and Gregory D. Hess, “How Much Does Violence Tax Trade?” *The Review of Economics and Statistics*, Vol. 88, No. 4, November 2006.

<sup>62</sup> Glick and Taylor, 2010, p. 102–103.

<sup>63</sup> Philippe Martin, Thierry Mayer, and Mathias Thoenig, “Civil Wars and International Trade,” *Journal of the European Economic Association*, Vol. 6, 2008.

<sup>64</sup> Glick and Taylor, 2010.

<sup>65</sup> See, for example, Paul Collier and Anke Hoeffler, “On Economic Causes of Civil War,” *Oxford Economic Papers*, Vol. 50, No. 4, 1998; Paul Collier and Anke Hoeffler, “Greed and Grievance in Civil War,” *Oxford Economic Papers*, Vol. 56, No. 4, August 2004; James D. Fearon and David D. Laitin, “Ethnicity, Insurgency, and Civil War,” *American Political Science Review*, Vol. 97, No. 1, February 2003; and Jack A. Goldstone, Robert H. Bates, David L. Epstein, Ted Robert Gurr, Michael Lustik, Monty G. Marshall, Jay Ulfelder, and Mark Woodward, “A Global Model for Forecasting Political Instability,” *American Journal of Political Science*, Vol. 54, No. 1, 2010. For a review of this literature, see Christopher Blattman and Edward Miguel, “Civil War,” *Journal of Economic Literature*, Vol. 48, No. 1, March 2010.

<sup>66</sup> See, for example, Bethany Lacina, “Explaining the Severity of Civil Wars,” *Journal of Conflict Resolution*, Vol. 50, No. 2, April 2006.

Specifically, our analysis builds on the empirical specifications considered by Collier and Hoeffler and augments them with our measures of external security commitments.<sup>67</sup>

### Trade Costs

The analysis of the direct relationship between security and trade costs is more limited than that of the other hypotheses that we explore. The only analysis that we know that explores this directly is Berger and colleagues, although they look at the relationship between U.S. security commitments and a proxy for trade costs rather than a direct measure of trade costs.<sup>68</sup>

Our analysis instead builds on the work of Hummels, who explored how technology, composition of trade, and cost shocks affect air and ocean shipping transportation costs.<sup>69</sup> Specifically, using the publicly available data from Hummels,<sup>70</sup> we simply augment his empirical approach with our measures of U.S. external security commitments.

### Organization of This Report

The next two chapters of this report provide additional details of our overall empirical approach; Chapter Two describes the security commitment variables being used, and Chapter Three describes our overall empirical approach. Chapters Four through Seven then describe how we adapt the four empirical approaches to address the hypotheses summarized earlier in this chapter. Chapter Eight uses the analysis from U.S. bilateral trade to extrapolate dollar-value estimates of U.S. security commitments. Chapter Nine concludes.

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<sup>67</sup> Collier and Hoeffler, 2004.

<sup>68</sup> Berger and colleagues proxy for trade costs by looking at changes in so-called “revealed comparative advantage” (Berger et al., 2013). Specifically, if an event reduces trade costs, then it should differentially benefit exports from industries in which the exporter has a comparative advantage.

<sup>69</sup> David Hummels, “Transportation Costs and International Trade in the Second Era of Globalization,” *Journal of Economic Perspectives*, Vol. 21, No. 3, Summer 2007.

<sup>70</sup> Hummels, 2007.

## Measuring U.S. External Security Commitments

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Our analysis focuses on two types of U.S. external security commitments: troop deployments and security treaties. The existing empirical literature has considered diverse plausible measures of U.S. external security commitments, including “diplomatic coordination,”<sup>1</sup> prevalence of international conflict,<sup>2</sup> amount of arms trade,<sup>3</sup> and U.S. aggregate troop numbers,<sup>4</sup> among others. Our logic for including troop deployments, rather than other potential measures, is similar to that of Biglaiser and DeRouen in that we believe that “presence of troops may better reflect the national interest and the foreign-policy goals of the country stationing troops.”<sup>5</sup> And security treaties offer a new approach for measuring the relative depth of U.S. commitments across countries and regions.

An important characteristic of these two approaches for measuring security commitments is that they allow comparability across time and geography. In all of our empirical specifications, we include country fixed effects (see Chapters Three through Seven for more details), because we are concerned that there may be a diversity of country-specific characteristics that influence both U.S. security commitments and the potential outcomes implied by either the engagement or retrenchment schools. Thus, our research focuses on how the deepening of security commitments *within a country* is related to changes in the economic or security environment *within that country*.

For each of the 14 measures of security commitments that we consider—five measures for personnel and nine for treaties, as discussed below—we focus on understanding the effect of deepening U.S. security commitments. That is, rather than focus on the raw number of personnel or the raw number of treaties, we instead specify each of these variables on a logarithmic scale. Thus, an increase from 100 to 200 personnel is equivalent to an increase from 100,000 to 200,000 personnel from the perspective of our analysis.

Our empirical analysis also explores the potential effects of country-specific versus regional effects. This allows us to test an indirect prediction of the hegemonic public goods theory—

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<sup>1</sup> For example, Pollins, 1989.

<sup>2</sup> For example, Keshk, Pollins, and Reuveny, 2004.

<sup>3</sup> For example, Rebecca M. Summary, “A Political-Economic Model of U.S. Bilateral Trade,” *The Review of Economics and Statistics*, Vol. 71, No. 1, February 1989.

<sup>4</sup> For example, Tim Kane, “Global U.S. Troop Deployment, 1950–2005,” The Heritage Foundation, Center for Data Analysis Report No. 06-02, May 24, 2006.

<sup>5</sup> Biglaiser and DeRouen, 2009, p. 205. Other factors (e.g., security environment) are also likely to affect the number of troops in a given area. In our analysis, we include a variety of control variables to control for these other potentially confounding factors, as discussed briefly in this section and at greater length in Chapter Three.

that is, that U.S. regional commitments may benefit all countries in a given region. For this regional analysis, we divide the world into the following eight regions: sub-Saharan Africa, Latin America and the Caribbean, East and Southeast Asia, Southern Asia, Middle East and North Africa, Western Europe, Eastern Europe, and Central Asia, based on 22 country groupings of the United Nations.<sup>6</sup> The regression analysis excludes Canada and Mexico, because each falls within a regional grouping that includes the United States itself.

The following two sections describe our two types of measures of security commitments in greater detail. In the final section, we provide some general summary statistics on these two categories before turning to our overall empirical strategy in Chapter Three.

## Disposition of U.S. Military Personnel

The first type of U.S. external security commitments that we consider is the disposition of U.S. military personnel. Biglaiser and DeRouen advocate the usefulness of troop deployments as a measure of U.S. security interests overseas, noting that,

[T]he presence of troops may better reflect the national interest and the foreign-policy goals of the country stationing troops. . . . [T]roop deployments also reveal national interests that go beyond interstate disputes. Historical and more contemporary examples in the post-[World War] II era show that governments usually send troops for noncombat purposes. . . . Although the British and U.S. may have fueled conflict in the countries where they deployed troops, both countries brought troops to serve economic (and security) ends and not to address immediate military conflicts in developing countries.

The post-[World War] II years even more clearly reflect that troops are often deployed to noncombat zones that help to serve national security goals. . . . Thus, the study of troops provides scholars the best of both worlds in understanding foreign-policy goals, as deployed troops may reflect potential conflict or they more commonly suggest cordial relations between countries. In either case, troops better reflect national security goals.<sup>7</sup>

Our analysis relies on a database of personnel overseas, developed based on data from the Defense Manpower Data Center.<sup>8</sup> As in previous studies, our measure of personnel numbers is the number of deployed personnel for each nation as of December 31 of a given year. The major difference between our data and that used in previous studies is that our data disaggregate troop deployments by service,<sup>9</sup> thus allowing us to explore potential differences across the Air

<sup>6</sup> We used these regions based on an aggregation of the 22 United Nations subregions (United Nations Statistics Division, “Standard Country and Area Codes Classifications,” web page, October 31, 2013). We chose not to use the United Nations’ five regional groups (Africa, Americas, Asia, Europe, and Oceania) because they did not correspond to the geopolitical posture of the United States.

<sup>7</sup> Biglaiser and DeRouen, 2009, p. 205. These two paragraphs compare the use of troops as a proxy for U.S. security commitments with “militarized interstate disputes” that restrict analysis to the use of force only.

<sup>8</sup> These data are available for download (Defense Manpower Data Center, 2014). We thank Stacie Pettyjohn and Steve Worman for providing a prepared database of these data.

<sup>9</sup> Examples of previous studies include Kane (2006) and Biglaiser and DeRouen (2009). The other difference is that these data contain a few more years than the data produced by Kane (2006), because RAND’s data-collection effort was more recent; however, we do not use these most recent data given our “five-year lag” identification strategy discussed in the next chapter.



Force, Army, Marine Corps, and Navy.<sup>10</sup> We do not anticipate the impact of U.S. personnel to vary by service; however, the data we use from the Defense Manpower Data Center may provide an incomplete measure of the number of Navy and Marine Corps personnel in particular, precisely because the data capture only those personnel on shore or in port on December 31 of any given year, thereby excluding sailors and marines at sea on that date.<sup>11</sup> Additionally, as our intent is to focus on the impact of U.S. security commitments, as distinct from other diplomatic commitments, we recode data points with ten or fewer marines as zero, because these smaller deployments are highly correlated with their assignments at U.S. embassies.<sup>12</sup>

In Figure 2.1, we provide a graphical illustration of the historical data by mapping the total commitment of U.S. forces from 1955 to 2004 at the country level (left side of the figure) and region level (right side of the figure). This figure focuses on the specific troop data used in our analysis of U.S. bilateral trade data. Thus, we report the number of U.S. forces only for countries for which economic data are available, as our analysis of U.S. bilateral trade is naturally restricted to these countries.<sup>13</sup>

The country-level data in this figure (left side) demonstrate the significant *within-country* variation; many countries experience a tenfold increase or decrease in the number of personnel during this 50-year period (each gradation of color indicates a tenfold increase). This variation is important for our identification approach, discussed in depth in Chapter Three. Meanwhile, the overall regional posture of U.S. personnel (right side), which is calculated as the total number of personnel in each of our eight regions, captures macro changes in commitments. Therefore, as an example, our analysis of Air Force personnel will determine both (1) whether major events—e.g., the rise and fall of the Vietnam War, the reduction of U.S. commitments in South Asia associated with Iran’s 1979 revolution, and the withdrawal of U.S. forces from Panama in 1999—influence economic outcomes in specific countries in those regions, and (2) whether the more idiosyncratic variation in commitments that we see in sub-Saharan Africa and Eastern Europe also influences economic outcomes in countries across those regions.

A summary of the U.S. country-specific troop deployments from 1955 to 2004 is shown in Figure 2.2. This figure reports the mean and median number of personnel per country and the share of countries in which the United States has no personnel, by service. As illustrated in the first panel, which reports the results for all troops, the United States had troops in all but 34 percent of countries in 2004, and the mean number of personnel was just more than 3,000, although the median number of personnel was just 13. This panel also clearly illustrates the Vietnam War, the drawdown after the Cold War, and the beginning of the war in Iraq.<sup>14</sup>

<sup>10</sup> The authors do not have an *a priori* view of why there may be differences across the services.

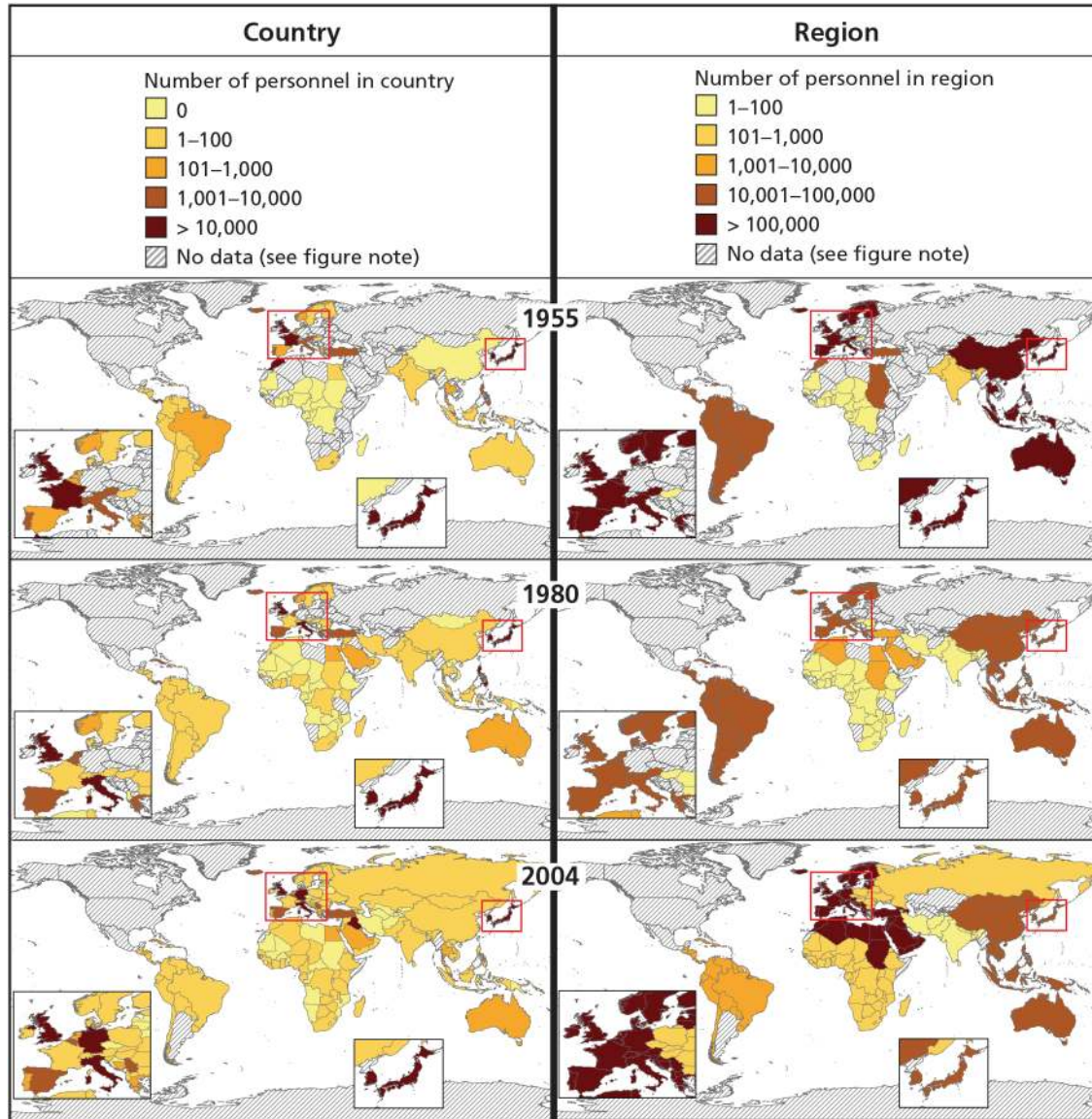
<sup>11</sup> Sailors or marines who are at sea as of December 31 do not seem to be assigned to a specific foreign country (looking, for example, at Defense Manpower Data Center, “Active Duty Master File Elements,” web page, undated). A separate data set suggests that more than 40 percent of sailors and 16 percent of marines are at sea in the waters of foreign countries at any given time and thus may not be captured in these data (U.S. Department of Defense, “Active Duty Military Personnel Strengths by Regional Area and by Country (309A),” December 31, 2002).

<sup>12</sup> In Chapter Four, we discuss how this restriction affects the point estimates.

<sup>13</sup> The economic data that we use (discussed in detail in Chapter Four, which presents the analysis of U.S. bilateral trade) do not provide consistent data for many countries that either merged or disaggregated. For example, our economic data do not provide separate information for East and West Germany before reunification, so these are excluded from the analysis. See Chapter Four for additional details.

<sup>14</sup> Initial operations in Afghanistan appear in our data only as a moderate increase in personnel in Bahrain. The available data for Afghanistan suggest that there were zero U.S. personnel in the country from 2001 to 2004, rising to nearly 20,000 in 2005 before increasing in subsequent years.

**Figure 2.1**  
**Global Disposition of U.S. Troops, 1955–2004**

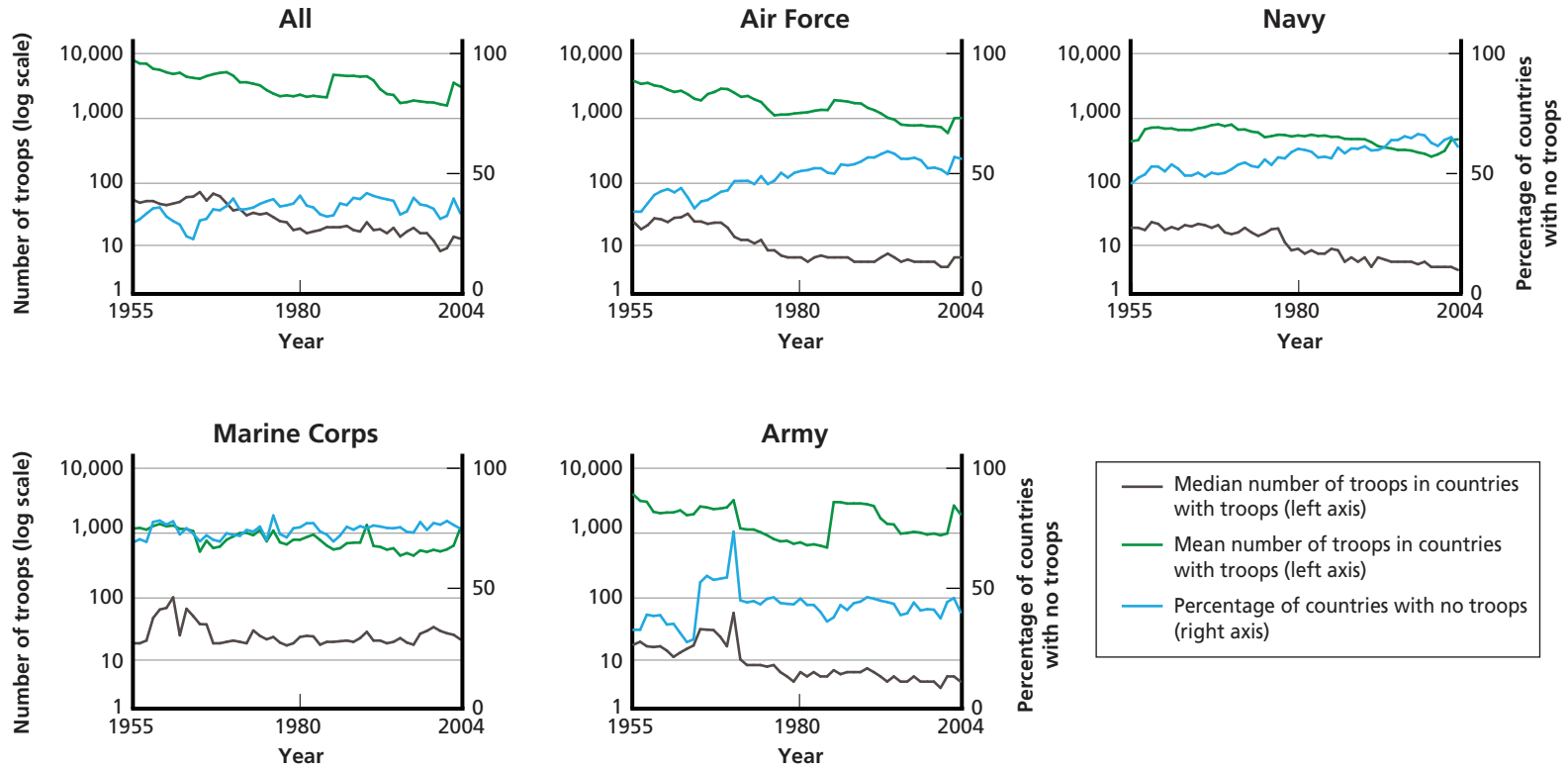


NOTE: The World Bank economic data being used (as discussed in Chapter Four) do not provide consistent data for many countries that either merged or disaggregated. For example, the data do not provide separate information for East and West Germany before reunification, so these countries are excluded from the analysis. Canada and Mexico are also deliberately excluded from the analysis.

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The “across time” variation that is the focus of our analysis differs substantively across the services. As an example, our analysis of Air Force and Army personnel will capture both the overall secular decrease and the rapid change in deployed personnel associated with the Vietnam War, Cold War, and Iraq War. Conversely, the Marine Corps has experienced neither a secular drawdown nor significant shifts associated with these major conflicts, so the analysis instead focuses on the variation attributable to the range of small conflicts in which it was involved.

**Figure 2.2**  
**U.S. Troops at the Country Level, 1955–2004**



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## Security Treaty Agreements

Security agreements maintained by the United States are the second type of U.S. external security commitments that we consider. These agreements measure the distribution and depth of U.S. international security commitments, as described by Kavanagh:

Treaties and agreements are powerful foreign policy tools that the United States uses to build and solidify relationships with partners and to influence the behavior of other states. As a result, the overall U.S. portfolio of treaties and agreements can offer insight into the distribution and depth of U.S. commitments internationally, including its military commitments and “presence” in a given country or region.<sup>15</sup>

This is especially true of security-related treaties and agreements, which can include military alliances, joint training agreements, materiel transfers, and access treaties. Security treaties may provide guarantees of protection, deterrence, dissuasion, reassurance during peacetime, the addition of friendly capabilities used for balancing or augmentation during wartime, military training or financial assistance, and specialized intelligence.<sup>16</sup>

Our analysis of security agreements relies on a new database compiled from the U.S. Department of State’s *Treaties in Force* publication and *Kavass’s Current Treaty Index*.<sup>17</sup> This database, which provides historical data on these security commitments from 1955 to the present, provides information on six types of security agreements. The first four types of treaties—operational, access, guarantees, and administrative and legal (or *admin* in this analysis)—are strictly security related, while the remaining two—financial and materiel—contain a blend of security and economic features.<sup>18</sup> Our analytical sections therefore treat

<sup>15</sup> Kavanagh, 2014, p. iii.

<sup>16</sup> Kavanagh, 2014, p. xi.

<sup>17</sup> Kavanagh, 2014.

<sup>18</sup> Details on how the treaty types were coded are available from Kavanagh (2014). The definitions of these treaty types are as follows:

- **Operational:** Operational treaties deal explicitly with the execution of military operations, including joint exercises, training, or other activities, deployments for peacekeeping or contingency activities, personnel exchanges, and assignment of liaison officers (but only military). Also included are information and intelligence sharing as well as other defense/security related activities to support military operations. . . .
- **Access:** Access treaties deal with access to facilities, infrastructure, bases, or air space in another country either for peacetime or contingency operations. Some access treaties involve a commitment of troops, but others deal exclusively with the access rights. Other access treaties also address financial issues (if there is some cost) and others are operational.
- **Financial:** Financial treaties deal with grants or other financial assistance (including funds for training, equipment purchases, and other investments) as well as the settlement of financial claims (e.g., due to damage in wars) or taxation issues.
- **Materiel:** Materiel treaties deal with equipment transfer or sale as well as agreements on construction and facilities or maintenance, commitment to joint research and development projects, or coproduction agreements. Materiel treaties may also include research and development on communications systems and similar types of technology. Many treaties are characterized as both financial and materiel, as many security force assistance treaties include provisions for both in a single agreement. In many cases, these joint materiel and financial agreements are the first that the United States signs with new treaty partners. Materiel treaties also often include provisions for training associated with the new equipment and sometimes provided by U.S. military personnel.

these two different types of treaty relationships separately, to explore the extent to which they might have differing effects.

Our analysis of these treaty relationships focuses on the number of treaties, both of each type and as a whole, that the United States maintains in a given year.<sup>19</sup> Each treaty can appear across multiple years of data, depending on the duration of the treaty. Indeed, nearly 80 percent of the security commitments signed since 1900 are still in effect, so that the aggregate number of treaty relationships maintained by the United States has increased over time.

A global map of these treaty arrangements, from 1955 to 2004, is provided in Figure 2.3. As with our global map of U.S. personnel, Figure 2.3 illustrates the number of U.S. treaties separately at the country level (left side of the figure) and region level (right side of the figure). The region-level measure of treaty arrangements is calculated as the aggregate number of signatories of all treaties.<sup>20</sup> Again, we report data only for countries for which contemporaneous economic data are available.

Here, again, we see significant *within-country* variation in the number of treaties, even though nearly all countries see deepened security treaties with the United States over this period. There is also significant regional variation, although each region experiences a significant increase in treaty relationships within the sample period.

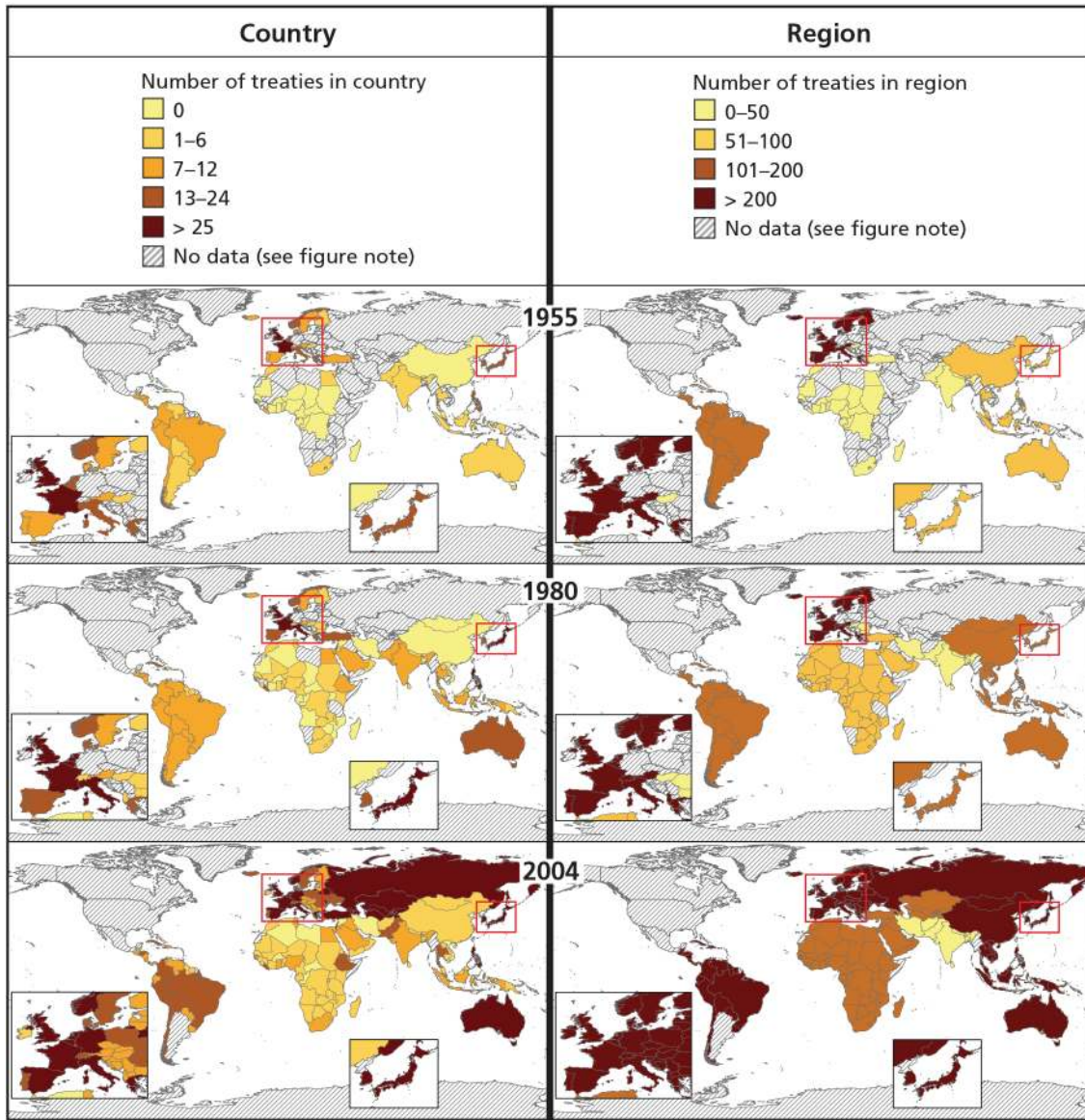
A summary of the U.S. country-specific treaty relationships from 1955 to 2004 is provided in Figure 2.4. This figure reports the mean and median number of treaties per country and the share of countries with which the United States has no treaty relationships, by type of treaty. The first panel, which reports the results for all treaties, illustrates that, by 2004, the United States had established treaty relationships with all but 7 percent of the countries with available data, and the mean number of treaties was just more than 12 per country.

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- **Guarantees:** Guarantee treaties address commitments for future cooperation. This may include alliances or neutrality pacts that govern the behavior of one or both states in the event of a future conflict or it may involve long-term commitments to nonproliferation, weapons reductions, or general amity and cooperation. . . .
  - **Administrative and Legal:** Administrative and legal treaties focus on issues related to the treaty, its implementation, or its enforcement. Because treaties and agreements are by their nature legal documents, many treaties fall into this category, at least as a secondary agreement type . . . [applied] to treaties that spend considerable time enumerating legal considerations and provisions related to the administration of the treaty or the rights and responsibilities of relevant parties. Many financial, access, and materiel treaties include administrative and legal components, but some treaties deal exclusively with administrative and legal issues. (Kavanagh, 2014, pp. 15–17)

<sup>19</sup> We focus on only the primary type for each treaty, although Kavanagh (2014) defines both the primary and secondary types for each.

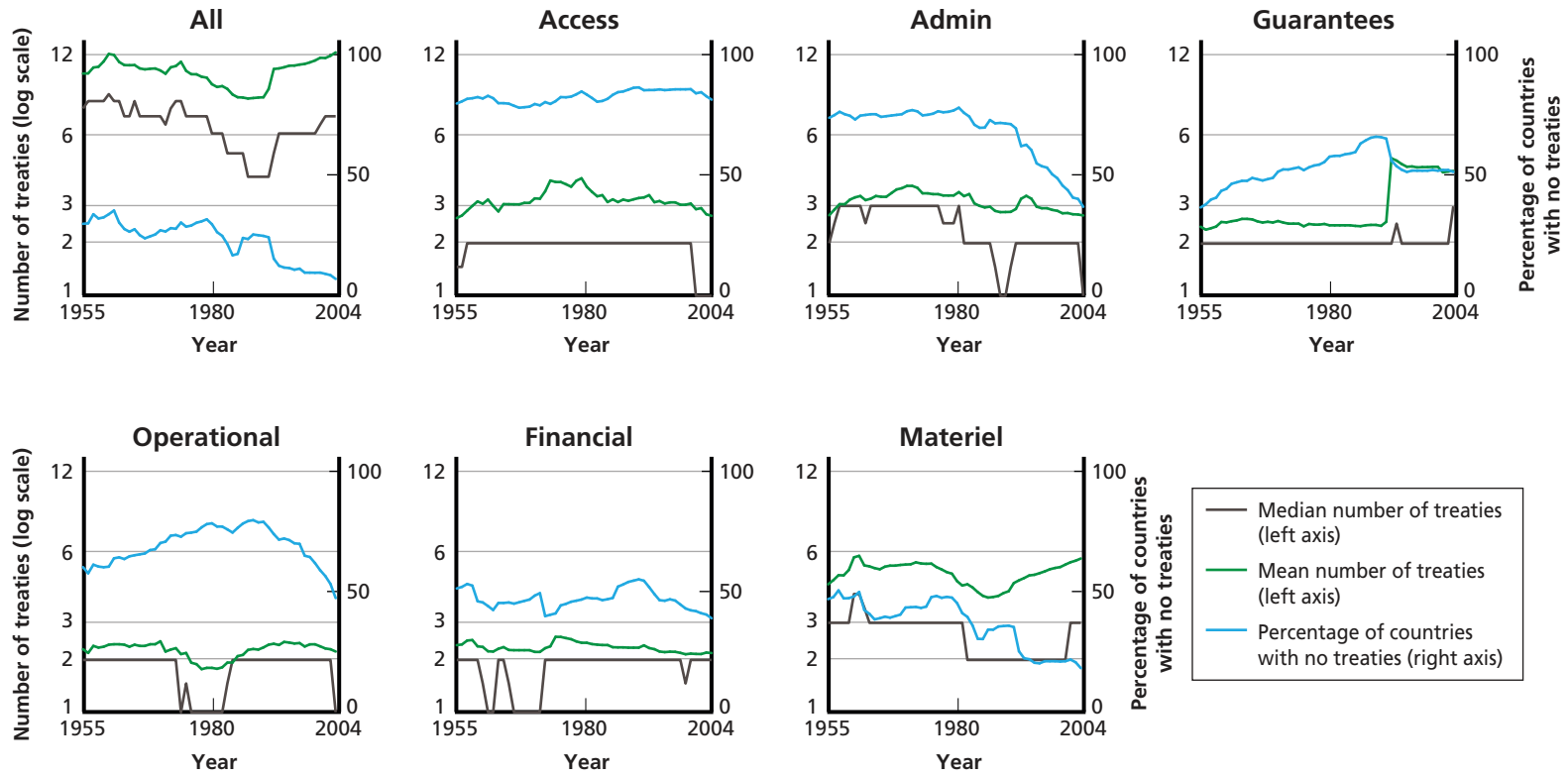
<sup>20</sup> As a hypothetical example, if a region had four multi-country security treaties and each had five signatories, this would contribute a value of 20 to our estimate of the number of regional security treaty commitments.

**Figure 2.3**  
**Global Disposition of Total U.S. Treaties, 1955–2004**



NOTE: The World Bank economic data being used (as discussed in Chapter Four) do not provide consistent data for many countries that either merged or disaggregated. For example, the data do not provide separate information for East and West Germany before reunification, so these countries are excluded from the analysis. Canada and Mexico are also deliberately excluded from the analysis.

**Figure 2.4**  
**U.S. Treaties at the Country Level, 1955–2004**



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## Summary Statistics for Measures of Security Commitments

The summary statistics for the 28 measures of security commitments that we consider throughout the analysis are reported in Table 2.1. These statistics reflect security commitment data from 1955 to 2004 (a total of 50 years). Although historical data are available from 1950 to 2010, the sample of data that we were able to use is limited in two ways. First, our economic control variables, which are from the World Bank, are available only from 1960 to the present. Second, our identification strategy, discussed in depth in Chapter Three, requires five-year lags. As a result, we use data on security commitments from 1955 to 2004.

The pairwise correlations between each of these 28 measures of security commitments, controlling for country and year fixed effects, are reported in Table 2.2.<sup>21</sup> Although U.S. troop deployments are strongly correlated across services, the same cannot be said of U.S. security treaties. Indeed, while all the pairwise correlations are positive and statistically significant, the country-specific levels of U.S. personnel are more strongly correlated with the country-specific numbers of treaties than those treaties are with one another. Perhaps most interestingly, the two types of treaties most closely tied with troop deployments, access and operational, have among the weakest relationship to troop deployments and other security treaties. This may suggest that personnel numbers alone may understate the importance of some relationships, because treaties can function as a substitute for personnel if they provide a mechanism for rapid response in case of a crisis or other event.

The relationship of the variation that we see in Figures 2.1 through 2.4, across time and regions, with several different measures of U.S. bilateral and global trade will be the focus of Chapters Four through Eight. Chapter Three provides background on our empirical approach and the types of data that we explore.

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<sup>21</sup> We calculate these pairwise correlations in two steps. In the first step, we regress each of the 28 security commitment measures on year and country fixed effects and then obtain the residuals from this regression. Specifically, defining security commitments as  $y_{i,t}$ , where  $i$  indexes countries and  $t$  indexes years, we obtain the residuals from the following regression:  $y_{i,t} = \alpha_i + \gamma_t + \varepsilon_{i,t}$ , where  $\varepsilon_{i,t}$  is the unobservable. In the second stage, we calculate the pairwise correlations across the 28 sets of residuals obtained in this fashion.



**Table 2.1**  
**Summary Statistics for Measures of Security Commitments, 1955–2004**

|                            |                               |                               | Observations <sup>a</sup> | Mean   | Standard Deviation | Minimum | Maximum |     |
|----------------------------|-------------------------------|-------------------------------|---------------------------|--------|--------------------|---------|---------|-----|
| Military personnel         | Country specific              | All                           | 6,363                     | 2,097  | 11,715             | 0.0     | 250,715 |     |
|                            |                               | Air Force                     | 6,363                     | 786    | 3,799              | 0.0     | 63,539  |     |
|                            |                               | Navy                          | 6,363                     | 214    | 1,001              | 0.0     | 16,000  |     |
|                            |                               | Marine Corps                  | 6,363                     | 201    | 1,938              | 0.0     | 35,200  |     |
|                            |                               | Army                          | 6,363                     | 896    | 8,051              | 0.0     | 209,583 |     |
|                            | Regional aggregates           | All                           | 368                       | 36,267 | 61,945             | 0.0     | 319,338 |     |
|                            |                               | Air Force                     | 368                       | 13,596 | 22,254             | 0.0     | 100,997 |     |
|                            |                               | Navy                          | 368                       | 3,707  | 5,421              | 0.0     | 21,737  |     |
|                            |                               | Marine Corps                  | 368                       | 3,473  | 7,780              | 0.0     | 35,516  |     |
|                            |                               | Army                          | 368                       | 15,491 | 34,041             | 0.0     | 217,011 |     |
| Security treaties          | Country specific              | All                           | 6,363                     | 8.4    | 12.1               | 0.0     | 123     |     |
|                            |                               | Noneconomic security treaties | Total                     | 6,363  | 3.9                | 6.1     | 0.0     | 46  |
|                            |                               |                               | Access                    | 6,363  | 0.6                | 2.1     | 0.0     | 21  |
|                            |                               |                               | Admin                     | 6,363  | 1.1                | 2.2     | 0.0     | 19  |
|                            |                               |                               | Guarantees                | 6,363  | 1.5                | 2.9     | 0.0     | 19  |
|                            |                               |                               | Operational               | 6,363  | 0.7                | 1.4     | 0.0     | 14  |
|                            |                               | Economic security treaties    | Total                     | 6,363  | 4.5                | 6.8     | 0.0     | 77  |
|                            |                               |                               | Financial                 | 6,363  | 1.2                | 1.8     | 0.0     | 12  |
|                            |                               |                               | Materiel                  | 6,363  | 3.3                | 5.4     | 0.0     | 65  |
|                            |                               |                               | Regional aggregates       | All    | 368                | 145.1   | 135.3   | 0.0 |
|                            | Noneconomic security treaties |                               |                           | Total  | 368                | 67.1    | 65.0    | 0.0 |
|                            |                               | Access                        |                           | 368    | 10.1               | 11.5    | 0.0     | 33  |
|                            |                               | Admin                         |                           | 368    | 18.6               | 22.8    | 0.0     | 97  |
|                            |                               | Guarantees                    |                           | 368    | 26.3               | 28.9    | 0.0     | 96  |
|                            |                               | Operational                   | 368                       | 12.1   | 15.3               | 0.0     | 65      |     |
| Economic security treaties | Total                         | 368                           | 78.0                      | 73.7   | 0.0                | 351     |         |     |
|                            | Financial                     | 368                           | 21.6                      | 18.9   | 0.0                | 74      |         |     |
|                            | Materiel                      | 368                           | 56.4                      | 56.1   | 0.0                | 277     |         |     |

NOTE: Summary statistics in this table are reported in nontransformed values; analysis focuses on the logarithm of the number of personnel and treaties (as illustrated in Figures 2.2 and 2.4).

<sup>a</sup> Analysis of regional aggregates includes the entire pool of country-year observations. Only unique region-year observations were kept in calculating these summary statistics.



## Empirical Approach and Identification

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The goal of our empirical analysis is to estimate the effect of U.S. security commitments on several outcomes. Our estimation approach uses a regression-based framework in which we calculate the correlation between U.S. regional commitments and various outcomes of interest, after controlling for other factors that may influence commitments, outcomes, or both. Thus, we focus on the estimation of  $Y = \alpha S + \gamma X + \varepsilon$ , where  $Y$  measures economic and security outcomes of interest (trade flows, political violence, and trade costs),  $S$  measures U.S. security commitments (troops and security agreements),  $X$  measures other factors that could influence commitments or outcomes, and  $\varepsilon$  is an error term. Our goal is to obtain a credible estimate of  $\alpha$ , the marginal effect of U.S. regional security commitments on outcomes of interest.

Credible estimates of  $\alpha$ , however, are complicated by two concerns. First, as highlighted in the retrenchment school's criticism of existing empirical evidence in support of the engagement school, there is a concern that analyses of the effect of security hegemony conflate economic hegemony and security hegemony. Another way of saying this is that economic relationships drive security commitments, and not vice versa as we intend to test. This is often referred to as the "reverse causality" challenge.

A second concern is that of spurious correlation. That is, some other contemporaneous factor or intrinsic characteristic of a particular country may be determining both security and economic outcomes, and we may inadvertently attribute the causality to security commitments alone.

Our *identification strategy*—that is, the empirical approach that we adopt to address these two concerns—relies on panel data methods. By *panel data*, we mean data that have both a cross-sectional dimension and a time dimension. In our case, we have observations of countries over time.

This panel data structure supports the two key elements of our identification strategy. The first is that, in addition to a variety of other control variables, all of our empirical specifications include country fixed effects. Thus, any underlying characteristics of a country that make it more prone to establishing security or economic relationships with the United States will not influence our analysis.

Second, rather than focus on the contemporaneous relationship between security commitments and other outcomes, we focus on the *five-year lag* of these security commitments. That is, we look at how security commitments from five years ago are related to economic and conflict outcomes today. This allows us to address the concern that some contemporaneous factor, unobservable from the perspective of our analysis, may be driving security commitments and our outcomes of interest.

Thus, for each of our outcome variables, our estimating equation is a variation of

$$Y_{it} = \alpha S_{i,t-5} + \gamma X_{it} + \delta_i + \eta_t + \varepsilon_{it},$$

where  $i$  and  $t$  represent, respectively, country and year indices;  $Y$  is the outcome of interest;  $S$  is the measure of the security commitment of interest;  $X$  is a vector of control variables;  $\delta_i$  are country fixed effects;  $\eta_t$  are year fixed effects; and  $\varepsilon_{it}$  is the error term. Throughout our analysis, we consider the potentially differing effects of country-specific versus regional security commitments. In estimating the effects of regional commitments, we replace the country-specific measure of security commitments— $S_{i,t-5}$ —with a lagged aggregate of all security commitments in country  $i$ 's region,  $R_i$ , as

$$\left( \sum_{y \in R_i} S_{y,t-5} \right)$$

Our identification strategy, which has been referred to in the literature as *lag identification*, is not optimal. Ideally, we would be able to find either (1) a natural experiment that induced variability in troop deployments or security treaties or (2) an *instrumental variable* for security commitments—that is, a variable that is correlated with security commitments but not correlated with the outcome variables of interest (trade, political violence, and trade costs) and so could be used to correct for the potential reverse causation. Unfortunately for analysis, but likely fortunately overall, the decision to send troops or establish treaties is almost never a stochastic event, making the discovery of a plausible natural experiment an unlikely outcome.<sup>1</sup> And without a clear theoretical model on how security commitments are determined, finding an instrumental variable becomes nearly impossible, because any variable that might influence security commitments is also likely a component of U.S. strategic decisionmaking.<sup>2</sup>

Thus, we rely on five-year lags of our security commitment variables, which will provide identification under two conditions. Following Bellemare, Pepinsky, and Masaki,<sup>3</sup> these two conditions are that (1) there is serial correlation in the security commitment variables and (2) there is no serial correlation in the unobserved sources of endogeneity.

The first assumption is testable, and the results of these correlations are reported in Table 3.1. Rather than report simple correlations, this table mimics our empirical analysis by exploring the pairwise correlations between contemporaneous and lagged variables, including country fixed effects and a constant term. Here, we find significant evidence that the first condition, that there is serial correlation in the commitment variables, is likely to hold. In par-

<sup>1</sup> One hypothetical situation that would help us is if there were numerous treaties approved by close margins in the U.S. Senate, say a 51–49 vote, and numerous other treaties disapproved by close margins, say 49–51. It is likely that the future expected economic prospects of both sets of countries would be similar, so we could compare the evolution of trade with countries with closely approved treaties and the evolution of trade with closely disapproved treaties. Unfortunately for analysis (but possibly fortunately for the way policy is made), such sets of treaties approved and disapproved by close votes do not exist.

<sup>2</sup> One possible instrumental variable would be U.S. pre- and post-World War II strategic planning documents. Some recently declassified base-planning documents suggest that this type of military documentation might exist. Subsequent work may seek to identify documents that contain data that could be used as instrumental variables.

<sup>3</sup> Marc F. Bellemare, Thomas B. Pepinsky, and Takaaki Masaki, “Lagged Explanatory Variables and the Estimation of Causal Effects,” Social Security Research Network, February 23, 2015.

**Table 3.1**  
**Correlations Between Lagged and Contemporaneous Security Commitment Variables**

|                            |                    | Military personnel         |                                |       |      |      |        |       |       |       |       | Security treaties |      |      |      |       |        |      |      |       |      |      |      |       |       |       |      |      |       |       |      |      |      |       |      |      |      |      |
|----------------------------|--------------------|----------------------------|--------------------------------|-------|------|------|--------|-------|-------|-------|-------|-------------------|------|------|------|-------|--------|------|------|-------|------|------|------|-------|-------|-------|------|------|-------|-------|------|------|------|-------|------|------|------|------|
|                            |                    | Country                    |                                |       |      |      | Region |       |       |       |       | Country           |      |      |      |       | Region |      |      |       |      |      |      |       |       |       |      |      |       |       |      |      |      |       |      |      |      |      |
| Five-year lags             | Military personnel | Country                    | All                            | 0.4*  | 0.5* | 0.5* | 0.2*   | 0.4*  | 0.1   | 0.2   | 0.0   | 0.0               | 0.1  | 0.1  | 0.1  | -0.1  | 0.0    | 0.3  | 0.1  | 0.1   | -0.2 | 0.2  | 0.1  | 0.1   | -0.1  | -0.1  | 0.2  | 0.1  | 0.1   | -0.1  | 0.1  | 0.0  | -0.1 | -0.3* | 0.0  |      |      |      |
|                            |                    |                            | Air Force                      | 0.4*  | 0.6* | 0.5* | 0.2    | 0.4*  | 0.1   | 0.2   | 0.0   | -0.1              | 0.1  | 0.1  | 0.2  | 0.3   | -0.2   | 0.3  | 0.2  | 0.1   | -0.3 | 0.1  | 0.0  | 0.0   | -0.2  | -0.2  | 0.1  | 0.0  | -0.1  | -0.3* | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  |      |      |
|                            |                    |                            | Navy                           | 0.3*  | 0.4* | 0.6* | 0.2    | 0.2*  | 0.1   | 0.1*  | 0.1   | 0.0               | 0.0  | 0.0  | 0.0  | -0.4  | -0.2   | 0.1  | 0.1  | -0.1  | -0.2 | 0.0  | -0.1 | -0.1  | -0.4  | -0.2* | -0.1 | -0.1 | -0.1  | -0.3* | -0.1 | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |      |
|                            |                    |                            | Marine Corps                   | 0.2*  | 0.2* | 0.3* | 0.4*   | 0.2*  | 0.1   | 0.0   | 0.1   | 0.1*              | 0.0  | 0.0  | 0.2* | 0.2   | 0.1    | 0.3  | 0.2* | 0.2   | 0.2* | 0.2* | 0.1  | 0.2   | 0.2   | 0.1   | 0.2  | 0.1  | 0.2   | 0.1   | 0.2  | 0.1  | 0.2  | 0.1   | 0.2  | 0.2  | 0.1  | 0.1  |
|                            |                    |                            | Army                           | 0.3*  | 0.4* | 0.3* | 0.2*   | 0.4*  | 0.1   | 0.1   | -0.1  | 0.0               | 0.0  | 0.0  | 0.1  | 0.1   | 0.2    | 0.0  | 0.2  | 0.1   | 0.1  | -0.2 | 0.2  | 0.1   | 0.1   | 0.0   | 0.0  | 0.0  | 0.1   | 0.1   | 0.0  | 0.1  | 0.1  | 0.1   | 0.0  | 0.1  | 0.0  | 0.1  |
|                            | Region             | All                        | 0.1*                           | 0.1*  | 0.1  | 0.0  | 0.1    | 0.4*  | 0.4*  | 0.2*  | 0.1*  | 0.2*              | 0.2* | 0.2* | 0.1  | 0.0   | 0.3*   | 0.1  | 0.2* | 0.0   | 0.2* | 0.3* | 0.4* | 0.0   | 0.0   | 0.0   | 0.5* | 0.2* | 0.3*  | 0.2   | 0.2* | 0.2  | 0.2* | 0.2   | 0.3* | 0.2  | 0.3* |      |
|                            |                    | Air Force                  | 0.1                            | 0.1*  | 0.1* | 0.0  | 0.1    | 0.3*  | 0.5*  | 0.2*  | -0.1* | 0.2*              | -0.1 | 0.0  | -0.1 | -0.3* | 0.2*   | 0.0  | -0.1 | -0.3* | -0.1 | -0.1 | 0.0  | -0.2* | -0.2* | 0.1   | -0.1 | -0.1 | -0.4* | -0.1  | -0.1 | -0.1 | -0.1 | -0.1  | -0.1 | -0.1 | -0.1 |      |
|                            |                    | Navy                       | 0.1                            | 0.1*  | 0.1* | 0.0  | 0.0    | 0.2*  | 0.4*  | 0.3*  | 0.0   | 0.1*              | -0.1 | 0.0  | 0.0  | -0.2  | 0.1    | -0.1 | -0.1 | -0.1  | -0.1 | 0.0  | 0.1  | 0.1   | -0.1* | 0.2*  | -0.1 | 0.0  | -0.1  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |      |
|                            |                    | Marine Corps               | 0.1*                           | 0.1   | 0.1  | 0.1* | 0.1*   | 0.5*  | 0.0   | 0.2*  | 0.7*  | 0.2*              | 0.6* | 0.3* | 0.2  | 0.4*  | 0.2    | 0.2  | 0.2  | 0.8*  | 0.9* | 0.8* | 1.1* | 1.0*  | 0.7*  | 0.6*  | 1.0* | 0.6* | 1.1*  | 1.6*  | 1.0* | 0.6* | 1.1* | 1.6*  | 1.0* | 0.6* |      |      |
|                            |                    | Army                       | 0.1                            | 0.1   | 0.1  | 0.0  | 0.1    | 0.5*  | 0.5*  | 0.3*  | 0.0   | 0.4*              | 0.1  | 0.1  | 0.2  | -0.1  | 0.2*   | 0.3  | 0.1  | -0.2  | 0.1  | 0.2* | 0.4* | 0.2   | -0.2  | 0.5*  | 0.4* | 0.2* | 0.4*  | 0.2   | 0.2* | 0.4* | 0.2  | 0.2*  | 0.4* | 0.2  | 0.2* |      |
|                            | Security treaties  | Country                    | All                            | 0.1*  | 0.0  | 0.0  | 0.1*   | 0.1*  | 0.1   | -0.1  | -0.1  | 0.1*              | 0.1* | 0.4* | 0.4* | 0.3*  | 0.5*   | 0.3* | 0.4* | 0.5*  | 0.4* | 0.5* | 0.4* | 0.5*  | 0.4*  | 0.4*  | 0.4* | 0.4* | 0.4*  | 0.3*  | 0.3* | 0.3* | 0.4* | 0.4*  | 0.4* | 0.3* | 0.4* |      |
|                            |                    |                            | Non-economic security treaties | Total | 0.1* | 0.0  | 0.0    | 0.1*  | 0.0*  | 0.0   | -0.1  | -0.1*             | 0.0* | 0.0  | 0.3* | 0.4*  | 0.4*   | 0.5* | 0.3* | 0.5*  | 0.3* | 0.2* | 0.3* | 0.2*  | 0.3*  | 0.1   | 0.2* | 0.2* | 0.3*  | 0.2*  | 0.2* | 0.3* | 0.2* | 0.2*  | 0.3* | 0.2* | 0.2* |      |
|                            |                    |                            | Access                         | 0.0   | 0.0  | 0.0  | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0               | 0.0  | 0.0* | 0.1* | 0.5*  | 0.1    | 0.1* | 0.1  | 0.0   | 0.0  | 0.0  | 0.0* | 0.1*  | 0.0   | 0.0   | 0.1* | 0.1* | 0.0   | 0.0   | 0.1* | 0.1* | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |      |
|                            |                    |                            | Admin                          | 0.0   | 0.0  | 0.0  | 0.0*   | 0.0   | 0.0   | -0.1* | -0.1* | 0.0*              | 0.0  | 0.2* | 0.2* | 0.1   | 0.6*   | 0.1* | 0.1  | 0.3*  | 0.3* | 0.3* | 0.2* | 0.2*  | 0.3*  | 0.2*  | 0.2* | 0.2* | 0.2*  | 0.2*  | 0.2* | 0.2* | 0.2* | 0.2*  | 0.2* | 0.2* | 0.2* | 0.2* |
|                            |                    |                            | Operational                    | 0.0   | 0.0  | 0.0  | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0               | 0.1* | 0.2* | 0.3* | 0.1   | 0.3*   | 0.1* | 0.7* | 0.2*  | 0.1* | 0.2* | 0.1* | 0.2*  | 0.1*  | 0.2*  | 0.2* | 0.3* | 0.1*  | 0.1   | 0.1* | 0.1* | 0.1* | 0.1*  | 0.1* | 0.1* | 0.1* |      |
|                            |                    | Economic security treaties | Total                          | 0.1*  | 0.0  | 0.0  | 0.1*   | 0.1*  | 0.1*  | 0.0   | 0.0   | 0.1*              | 0.1* | 0.3* | 0.3* | 0.2   | 0.4*   | 0.2* | 0.3* | 0.5*  | 0.5* | 0.5* | 0.3* | 0.3*  | 0.3*  | 0.2*  | 0.3* | 0.3* | 0.3*  | 0.3*  | 0.3* | 0.3* | 0.3* | 0.3*  | 0.3* | 0.3* | 0.3* |      |
|                            |                    | Financial                  | 0.0                            | 0.0   | 0.0  | 0.0* | 0.0    | 0.0*  | 0.0   | 0.0   | 0.1*  | 0.0               | 0.1* | 0.1* | 0.0  | 0.2*  | 0.1    | 0.0  | 0.2* | 0.5*  | 0.1* | 0.1* | 0.1* | 0.2*  | 0.1*  | 0.1*  | 0.1* | 0.1* | 0.1*  | 0.1*  | 0.1* | 0.1* | 0.1* | 0.1*  | 0.1* | 0.1* |      |      |
|                            |                    | Materiel                   | 0.1*                           | 0.0   | 0.0  | 0.1* | 0.1*   | 0.1*  | 0.0   | 0.0   | 0.1*  | 0.1*              | 0.3* | 0.3* | 0.2  | 0.4*  | 0.2*   | 0.3* | 0.4* | 0.3*  | 0.5* | 0.3* | 0.3* | 0.3*  | 0.3*  | 0.3*  | 0.3* | 0.3* | 0.3*  | 0.3*  | 0.3* | 0.3* | 0.3* | 0.3*  | 0.3* | 0.3* |      |      |
|                            |                    | Region                     | All                            | 0.0   | 0.0  | 0.0  | 0.1*   | 0.0   | 0.2*  | -0.1  | 0.0   | 0.2*              | 0.1* | 0.4* | 0.3* | 0.3   | 0.5*   | 0.2* | 0.3* | 0.5*  | 0.5* | 0.6* | 0.6* | 0.6*  | 0.5*  | 0.4*  | 0.6* | 0.5* | 0.6*  | 0.8*  | 0.6* | 0.5* | 0.6* | 0.8*  | 0.6* |      |      |      |
|                            |                    |                            | Non-economic security treaties | Total | 0.0  | 0.0  | 0.0    | 0.1   | 0.0   | 0.1*  | -0.1* | -0.1*             | 0.2* | 0.1* | 0.4* | 0.3*  | 0.3    | 0.6* | 0.2* | 0.3*  | 0.5* | 0.5* | 0.5* | 0.6*  | 0.6*  | 0.6*  | 0.4* | 0.6* | 0.5*  | 0.5*  | 0.6* | 0.6* | 0.5* | 0.5*  | 0.6* | 0.5* |      |      |
| Access                     | 0.0                |                            | 0.0                            | 0.0   | 0.0  | 0.0  | 0.1*   | 0.0   | -0.1  | 0.0*  | 0.1*  | 0.2*              | 0.2* | 0.2  | 0.3* | 0.2*  | 0.0    | 0.3* | 0.4* | 0.3*  | 0.2* | 0.3* | 0.7* | 0.2*  | 0.2*  | 0.2*  | 0.2* | 0.2* | 0.2*  | 0.2*  | 0.2* | 0.2* | 0.2* | 0.2*  |      |      |      |      |
| Admin                      | 0.0                |                            | -0.1*                          | -0.2* | 0.1* | 0.0  | 0.0    | -0.4* | -0.3* | 0.3*  | 0.0   | 0.6*              | 0.3* | 0.3  | 1.0* | 0.1   | 0.0    | 0.9* | 1.2* | 0.8*  | 0.8* | 0.8* | 1.1* | 1.0*  | 0.5*  | 0.5*  | 0.8* | 1.3* | 0.8*  | 0.8*  | 1.3* | 0.8* | 0.8* | 1.3*  |      |      |      |      |
| Operational                | 0.0                |                            | 0.0                            | 0.0   | 0.1  | 0.0  | 0.2*   | 0.0   | 0.0   | 0.1*  | 0.1*  | 0.3*              | 0.3* | 0.3  | 0.4* | 0.2*  | 0.3*   | 0.3* | 0.3* | 0.4*  | 0.4* | 0.4* | 0.5* | 0.5*  | 0.2*  | 0.5*  | 0.4* | 0.4* | 0.4*  | 0.4*  | 0.4* | 0.4* | 0.4* | 0.4*  |      |      |      |      |
| Economic security treaties | Total              | 0.0                        | 0.0                            | 0.0   | 0.1* | 0.0  | 0.2*   | -0.1  | 0.0   | 0.3*  | 0.1*  | 0.4*              | 0.3* | 0.3  | 0.5* | 0.2*  | 0.3*   | 0.6* | 0.6* | 0.6*  | 0.7* | 0.7* | 0.5* | 0.4*  | 0.6*  | 0.6*  | 0.7* | 0.9* | 0.6*  | 0.6*  | 0.7* | 0.9* | 0.6* |       |      |      |      |      |
| Financial                  | 0.0                | 0.0*                       | 0.0                            | 0.1*  | 0.0  | 0.2* | 0.0    | 0.1   | 0.2*  | 0.1*  | 0.3*  | 0.2*              | 0.1  | 0.4* | 0.2* | 0.0   | 0.5*   | 0.6* | 0.4* | 0.5*  | 0.5* | 0.6* | 0.4* | 0.4*  | 0.4*  | 0.3*  | 0.5* | 0.8* | 0.5*  | 0.5*  | 0.8* | 0.5* |      |       |      |      |      |      |
| Materiel                   | 0.0                | 0.0                        | 0.0                            | 0.1*  | 0.1  | 0.2* | -0.1   | 0.0   | 0.3*  | 0.2*  | 0.4*  | 0.3*              | 0.3  | 0.6* | 0.2* | 0.3*  | 0.6*   | 0.6* | 0.6* | 0.7*  | 0.7* | 0.5* | 0.5* | 0.7*  | 0.6*  | 0.7*  | 0.7* | 0.7* | 0.7*  | 0.7*  | 0.7* | 0.7* | 0.7* |       |      |      |      |      |

NOTE: Point estimates are results from pairwise regressions with the lagged variable as the explanatory variable. All pairwise regressions include country fixed effects and a constant term. Standard errors reflect clustering at the country level.

\* 1-percent significance.

ticular, all the estimates along the diagonal (the correlation of the same variables over time) are positive and strongly statistically significant.

While the second condition, pertaining to the serial correlation in the unobserved sources of endogeneity, is not directly testable, the evidence presented in Table 3.1 suggests that this condition holds as well. In particular, if either (1) there was an unobserved factor driving security commitments and our outcome variables or (2) the outcome variables were driving the security commitments, then we would expect significant correlation within and across different types of security commitments. However, as demonstrated in Table 3.1, these correlations are very weak. As an example, although the correlation of contemporaneous country-specific treaty and personnel commitments are strongly correlated (see Table 2.2), the correlations that we see in Table 3.1 are very weakly correlated.

## U.S. Bilateral Trade

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The potential relationship between U.S. external security commitments and U.S. bilateral trade is the most contentious between the engagement and retrenchment schools. Although all three major theories of the engagement school—hegemonic public goods, hegemonic reassurance, and hegemonic influence—predict that U.S. security commitments should influence U.S. bilateral trade, the retrenchment school argues that these commitments have no (or limited) effect on such trade.

In this chapter, we provide evidence that U.S. external security commitments do indeed have positive effects on U.S. bilateral trade—evidence that supports the engagement school perspective. We are certainly not the first to provide evidence of this relationship, as it has been well established by the existing empirical literature (see Chapter One). Our major contribution, which we provide in this chapter, is therefore threefold. First, we explore the relationship of both troop presence and treaty commitments, using our newly constructed treaty database, with U.S. bilateral trade; our data also allow us to explore possible variation across different types of services and treaties. Second, we examine whether these persistent commitments are differentially benefiting U.S. importers, U.S. exporters, or trade relationships overall. Third, we provide analysis using the gravity model of trade—now the workhorse of the empirical global trade literature—and employ an identification strategy that focuses on exploring the five-year lagged relationship between security commitments and trade.

In our analysis of aggregate bilateral trade, we find significant evidence for a positive relationship between aggregate U.S. bilateral trade and the number of U.S. security treaties, airmen, and soldiers. When we focus the analysis on only the potential intensive effects of security commitments—that is, increased trade with existing partners (which ignores the possibility that these security commitments might increase the likelihood of trade with new partners)—the results are largely analogous, although the impact of treaties is no longer statistically significant, and the total number of personnel becomes statistically significant.

We then disaggregate this analysis to consider separately imports (to the United States) and exports (from the United States). Our country-specific results are driven equally by an effect on exports and imports, suggesting that the U.S. overseas presence may improve stability at the country level. Although our analytical approach does not allow us to directly test how this presence influences net exports from the United States, our analysis suggests that the effect of the U.S. overseas presence may be larger for imports than exports. Whether these security commitments do indeed improve trade through a stability result will be tested further in Chapters Five and Six, and the potential trade cost explanation will be considered in Chapter Seven.

## Methodology

The relationship between the U.S. security posture and bilateral trade has been explored extensively in the empirical literature, as discussed in Chapter One. Our contribution builds on the early work of Pollins, who provided evidence that “trade followed the flag” in illustrating the positive correlation between U.S. overseas commitments and trade,<sup>1</sup> as well as Biglaiser and DeRouen, who examined the reciprocal relationship between overseas troop presence and trade.<sup>2</sup>

Our empirical specifications, while based on the specifications used originally by Pollins,<sup>3</sup> use the gravity model of trade now preferred in the academic empirical trade literature.<sup>4</sup> Thus, we estimate

$$\ln(T_{it}) = \alpha \ln(S_{i,t-5} + 1) + \gamma_1 \ln(Y_{it}) + \gamma_2 \ln\left(\frac{Y_{it}}{P_{it}}\right) + \delta_i + \eta_t + \varepsilon_{it}, \quad (1)$$

where  $i$  denotes U.S. trade partners and  $t$  denotes year. The dependent variable in this analysis,  $\ln(T_{it})$ , is defined as the average of imports and exports between the United States and country  $i$  in year  $t$  (following the approach used in Glick and Taylor).<sup>5</sup> The explanatory variables include our measure of security commitments [ $\ln(S_{i,t-5} + 1)$ ] and two measures of economic performance:

- log GDP [ $\ln(Y_{it})$ ]
- log GDP per capita  $\left[ \ln\left(\frac{Y_{it}}{P_{it}}\right) \right]$ .<sup>6</sup>

We also include country fixed effects ( $\delta_i$ ), which capture any country-specific factors (e.g., trade costs related to distance) that are constant over time,<sup>7</sup> and year fixed effects ( $\eta_t$ ). Reported standard errors reflect clustering at the country level.<sup>8</sup>

<sup>1</sup> Pollins, 1989.

<sup>2</sup> Biglaiser and DeRouen, 2009.

<sup>3</sup> Pollins, 1989.

<sup>4</sup> For example, James E. Anderson and Eric van Wincoop, “Gravity with Gravitas: A Solution to the Border Puzzle,” *American Economic Review*, Vol. 93, No. 1, March 2003.

<sup>5</sup> Glick and Taylor, 2010.

<sup>6</sup> The inclusion of GDP and GDP per capita follows the preferred approach in the gravity trade model literature (e.g., Glick and Taylor, 2010). Note that our analysis does not explore effects of the U.S. security commitments that are not log-linear. Without existing theoretical results to guide the analysis, our approach relies on the intuition of the gravity model.

<sup>7</sup> Time-varying country-specific factors will be reflected in the point estimates for  $\alpha$ . One important time-varying factor that could influence bilateral trade is the cost of trade between nations, which is determined by a variety of factors; this is the focus of Chapter Seven.

<sup>8</sup> Cameron and Miller report that increasingly refined clusters increase the risk of bias (A. Colin Cameron and Douglas L. Miller, “A Practitioner’s Guide to Cluster-Robust Inference,” *The Journal of Human Resources*, Vol. 50, No. 2, Spring 2013). Thus, while we believe that country-level clusters are appropriate for this analysis, we also examine the robustness of these results to clustering at the regional level. The notes to each table in this chapter discuss how, if at all, the level used for clustering affects the results obtained.



The U.S. bilateral trade data are from Barbieri and Keshk and from Barbieri, Keshk, and Pollins.<sup>9</sup> GDP and GDP per capita are from the World Bank's World Development Indicators;<sup>10</sup> these data are denominated in constant 2005 U.S. dollars. The trade flow data are deflated into constant 2005 U.S. dollars using the U.S. consumer price index available in the World Development Indicators.

## Aggregate U.S. Bilateral Trade

The relationship between U.S. security commitments and aggregate U.S. bilateral trade, which averages imports and exports, is reported in Tables 4.1 and 4.2. Both these tables, which explore the potential role of country-specific and regionally aggregated security commitments, respectively, provide evidence that these commitments have meaningful and statistically significant effects on trade.

Tables 4.1 and 4.2 are organized similarly. Each table reports the results from 14 regressions, with those regression results organized into two halves. The left halves report the results from the analysis of U.S. military personnel, with the columns reporting the results from either the aggregated personnel numbers (left-most column of results) or the personnel numbers from each service. The halves on the right are analogous, except that they focus on security treaties, as indicated by the column headings. These security treaties are disaggregated by those with an economic component (economic security treaties) and those without an economic component (noneconomic security treaties). We also examine the aggregate number of treaties, as well as subtotals for both of the treaty subcategories.

Two key findings are illustrated in Table 4.1. The first is that U.S. security commitments at the country level have a significant positive relationship with trade. For personnel, we find a nearly identical statistically significant positive relationship between the number of Army and Air Force personnel and aggregate U.S. bilateral trade. Although we do not find a statistically significant impact for Marine Corps, Navy, or total personnel, this may be because our data provide an incomplete estimate of the marines and sailors in each country (see discussion in Chapter Two). When we include small deployments of marines—that is, ten or fewer marines, which we believe to be highly correlated with the presence of a U.S. embassy—the estimated impact of the marines becomes positive, though still not statistically significant. For treaties, we find that the overall number of treaties exhibits a positive relationship with total bilateral trade. Although we find a negative, and statistically significant, point estimate for “operational” treaties, we find the exact opposite point estimate for this type of treaty in the regional aggregate (as reported in Table 4.2). Thus, we consider the net impact of this type of treaty to be negligible.

<sup>9</sup> Katherine Barbieri and Omar Keshk, *Correlates of War Project: Trade Data Set Codebook*, Version 3.0, 2012; Katherine Barbieri, Omar M. G. Keshk, and Brian Pollins, “Trading Data: Evaluating Our Assumptions and Coding Rules,” *Conflict Management and Peace Science*, Vol. 26, No. 5, November 2009.

<sup>10</sup> World Bank, *World Development Indicators*, Washington, D.C., various years. The World Development Indicators do not provide GDP or GDP per capita in constant dollars for the following country-year observations: Czechoslovakia (1960–1992), East Germany (1960–1989), West Germany (1960–1989), Myanmar, Nauru, North Korea, Somalia, Taiwan, North Vietnam (1960–1975), South Vietnam (1960–1975), North Yemen (1960–1990), South Yemen (1960–1990), and Yugoslavia (1960–1992). These countries are therefore excluded from our analysis.

**Table 4.1**  
**Effect of Country-Specific Security Commitments on U.S. Bilateral Trade**

|                        | U.S. Military Personnel |                  |                  |                  |                  | Treaties         |                               |                  |                  |                  |                            |                  |                  |                  |  |
|------------------------|-------------------------|------------------|------------------|------------------|------------------|------------------|-------------------------------|------------------|------------------|------------------|----------------------------|------------------|------------------|------------------|--|
|                        | All                     | Air Force        | Navy             | Marine Corps     | Army             | All              | Noneconomic Security Treaties |                  |                  |                  | Economic Security Treaties |                  |                  |                  |  |
|                        |                         |                  |                  |                  |                  |                  | Total                         | Access           | Admin            | Guarantees       | Operational                | Total            | Financial        | Material         |  |
| No. of personnel       | 0.09<br>(0.06)          | 0.15*<br>(0.06)  | 0.04<br>(0.09)   | -0.01<br>(0.06)  | 0.14*<br>(0.06)  |                  |                               |                  |                  |                  |                            |                  |                  |                  |  |
| No. of treaties        |                         |                  |                  |                  |                  | 0.34*<br>(0.16)  | 0.13<br>(0.14)                | 0.06<br>(0.49)   | 0.06<br>(0.14)   | 0.10<br>(0.20)   | -0.41*<br>(0.20)           | 0.39<br>(0.21)   | -0.06<br>(0.30)  | 0.27<br>(0.20)   |  |
| log(GDP)               | 1.02<br>(0.56)          | 0.98<br>(0.56)   | 1.10<br>(0.56)   | 1.11*<br>(0.56)  | 1.02<br>(0.56)   | 1.08<br>(0.56)   | 1.12*<br>(0.57)               | 1.11<br>(0.57)   | 1.12*<br>(0.57)  | 1.16<br>(0.60)   | 1.12*<br>(0.56)            | 1.13*<br>(0.56)  | 1.11*<br>(0.56)  | 1.13*<br>(0.57)  |  |
| log(GDP per capita)    | 1.59**<br>(0.50)        | 1.61**<br>(0.50) | 1.53**<br>(0.49) | 1.52**<br>(0.49) | 1.57**<br>(0.49) | 1.51**<br>(0.48) | 1.49**<br>(0.49)              | 1.51**<br>(0.49) | 1.51**<br>(0.50) | 1.47**<br>(0.52) | 1.56**<br>(0.50)           | 1.49**<br>(0.48) | 1.51**<br>(0.49) | 1.47**<br>(0.49) |  |
| Year fixed effects?    | Yes                     | Yes              | Yes              | Yes              | Yes              | Yes              | Yes                           | Yes              | Yes              | Yes              | Yes                        | Yes              | Yes              | Yes              |  |
| Country fixed effects? | Yes                     | Yes              | Yes              | Yes              | Yes              | Yes              | Yes                           | Yes              | Yes              | Yes              | Yes                        | Yes              | Yes              | Yes              |  |
| <i>T</i>               | 50                      | 50               | 50               | 50               | 50               | 50               | 50                            | 50               | 50               | 50               | 50                         | 50               | 50               | 50               |  |
| No. of countries       | 177                     | 177              | 177              | 177              | 177              | 177              | 177                           | 177              | 177              | 177              | 177                        | 177              | 177              | 177              |  |
| <i>N</i>               | 6,363                   | 6,363            | 6,363            | 6,363            | 6,363            | 6,363            | 6,363                         | 6,363            | 6,363            | 6,363            | 6,363                      | 6,363            | 6,363            | 6,363            |  |

NOTE: *T* = number of years of data; *N* = total number of observations in the analysis.

\* = 5-percent significance; \*\* = 1-percent significance. Standard errors reflect clustering at the country level. Regional clustering provides similar results.

**Table 4.2**  
**Effect of Regional Security Commitments on U.S. Bilateral Trade**

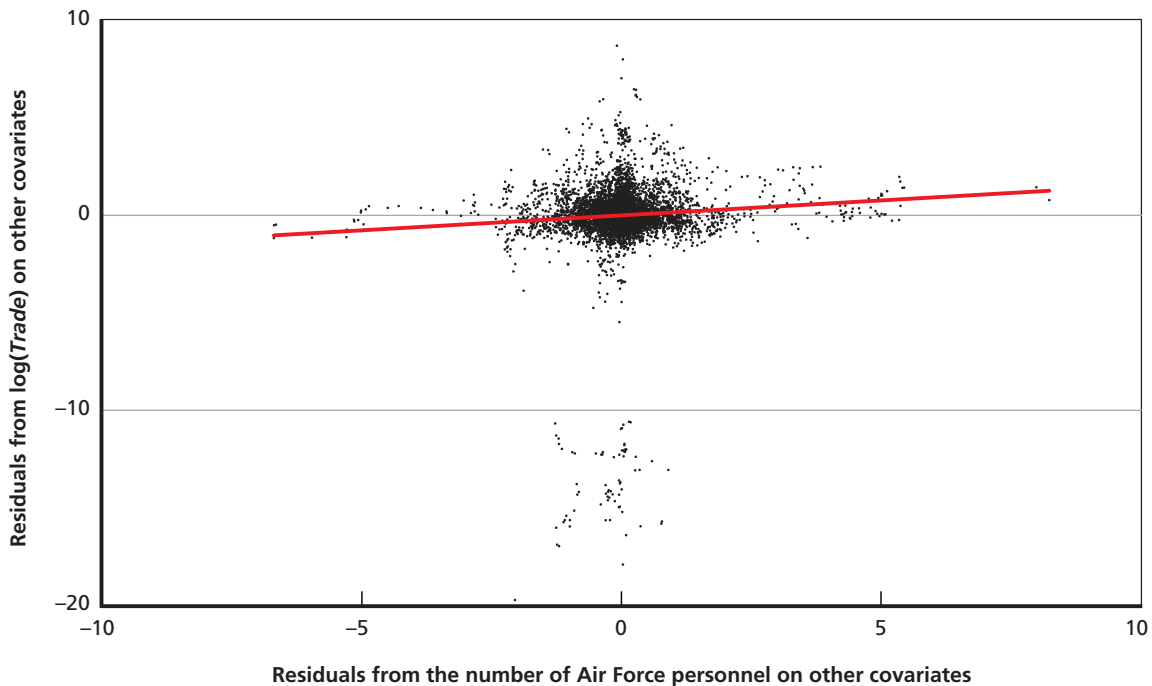
|                        | U.S. Military Personnel |                  |                  |                  |                  | Treaties         |                               |                  |                  |                  |                            |                  |                  |                  |
|------------------------|-------------------------|------------------|------------------|------------------|------------------|------------------|-------------------------------|------------------|------------------|------------------|----------------------------|------------------|------------------|------------------|
|                        | All                     | Air Force        | Navy             | Marine Corps     | Army             | All              | Noneconomic Security Treaties |                  |                  |                  | Economic Security Treaties |                  |                  |                  |
|                        |                         |                  |                  |                  |                  |                  | Total                         | Access           | Admin            | Guarantees       | Operational                | Total            | Financial        | Materiel         |
| No. of personnel       | 0.08<br>(0.06)          | 0.15*<br>(0.07)  | 0.05<br>(0.09)   | 0.07<br>(0.05)   | -0.01<br>(0.05)  |                  |                               |                  |                  |                  |                            |                  |                  |                  |
| No. of treaties        |                         |                  |                  |                  |                  | 0.18<br>(0.10)   | 0.12<br>(0.13)                | -0.26<br>(0.21)  | 0.02<br>(0.12)   | -0.12<br>(0.17)  | 0.41*<br>(0.17)            | 0.21*<br>(0.10)  | 0.38<br>(0.25)   | 0.18<br>(0.10)   |
| log(GDP)               | 1.11<br>(0.56)          | 1.16*<br>(0.56)  | 1.14*<br>(0.57)  | 1.00<br>(0.56)   | 1.11<br>(0.57)   | 1.07<br>(0.55)   | 1.08<br>(0.55)                | 1.18*<br>(0.56)  | 1.11<br>(0.56)   | 1.06<br>(0.60)   | 0.87<br>(0.59)             | 1.10<br>(0.56)   | 0.99<br>(0.59)   | 1.09<br>(0.56)   |
| log(GDP per capita)    | 1.56**<br>(0.48)        | 1.50**<br>(0.49) | 1.50**<br>(0.50) | 1.69**<br>(0.48) | 1.52**<br>(0.49) | 1.59**<br>(0.48) | 1.55**<br>(0.49)              | 1.48**<br>(0.50) | 1.52**<br>(0.49) | 1.59**<br>(0.54) | 1.82**<br>(0.56)           | 1.60**<br>(0.48) | 1.73**<br>(0.52) | 1.60**<br>(0.48) |
| Year fixed effects?    | Yes                     | Yes              | Yes              | Yes              | Yes              | Yes              | Yes                           | Yes              | Yes              | Yes              | Yes                        | Yes              | Yes              | Yes              |
| Country fixed effects? | Yes                     | Yes              | Yes              | Yes              | Yes              | Yes              | Yes                           | Yes              | Yes              | Yes              | Yes                        | Yes              | Yes              | Yes              |
| <i>T</i>               | 50                      | 50               | 50               | 50               | 50               | 50               | 50                            | 50               | 50               | 50               | 50                         | 50               | 50               | 50               |
| No. of countries       | 177                     | 177              | 177              | 177              | 177              | 177              | 177                           | 177              | 177              | 177              | 177                        | 177              | 177              | 177              |
| <i>N</i>               | 6,363                   | 6,363            | 6,363            | 6,363            | 6,363            | 6,363            | 6,363                         | 6,363            | 6,363            | 6,363            | 6,363                      | 6,363            | 6,363            | 6,363            |

\* = 5-percent significance; \*\* = 1-percent significance. Standard errors reflect clustering at the country level. Regional clustering provides similar results.

The second finding is that the magnitude of the benefit of treaties is larger than that of personnel. As the outcome and explanatory variable are specified in logarithmic terms, the point estimate of 0.34 for treaties suggests that a doubling of security treaty commitments would expand trade by 34 percent. In contrast, a doubling of Army or Air Force personnel would increase trade by, respectively, 14 percent or 15 percent.

One concern with the results provided in Table 4.1 is that they may stem from a small set of outliers. To rule out this possibility, we employ the Frisch-Waugh statistical method.<sup>11</sup> In this respect, Figure 4.1 provides a Frisch-Waugh plot of bilateral trade and the number of Air Force personnel.<sup>12</sup> The slope of the fit for this scatter plot is 0.15, and its sign and significance is not sensitive to the elimination of outliers from either of the sets of residuals. Therefore, we conclude that the results for aggregate U.S. bilateral trade do not stem from a small set of outliers.

**Figure 4.1**  
Frisch-Waugh Plot of Bilateral Trade on Number of Air Force Personnel



RAND RR518-4.1

<sup>11</sup> We thank Alex Rothenberg for raising this issue and suggesting the Frisch-Waugh approach to explore it.

<sup>12</sup> The Frisch-Waugh approach explores the relationship between the residuals from two regressions:

$$\begin{aligned} \bullet \quad \ln(T_{it}) &= \gamma_1 \ln(Y_{it}) + \gamma_2 \ln\left(\frac{Y_{it}}{P_{it}}\right) + \delta_i + \eta_t + \varepsilon_{it} \\ \bullet \quad \ln(S_{i,t-5} + 1) &= \gamma_1 \ln(Y_{it}) + \gamma_2 \ln\left(\frac{Y_{it}}{P_{it}}\right) + \delta_i + \eta_t + \varepsilon_{it}. \end{aligned}$$

Frisch-Waugh demonstrated that the correlation between these two sets of residuals is equivalent to estimating in the full regression.

A second concern with the results in Table 4.1 is that they may be artificially driven by the structure of the parameterization of the trade model. As an example, although our specification of the gravity model is now the “standard” in the academic literature, one concern may be that the use of the U.S. consumer price index to convert trade flows from nominal to real dollars may create a structural relationship with U.S. security commitments.

We conduct two robustness checks in order to examine the sensitivity of our results. First, repeating the empirical exercise used for creating Table 4.1 but using nominal rather than real U.S. dollars in estimation yields results (not reported) that are similar in magnitude and significance to those reported in Table 4.1.

Second, we conduct cross-sectional regressions (using only a single year of data) quinquennially from 1960 to 2005, and examine the comparability of these point estimates to those reported in Table 4.1.<sup>13</sup> These results, reported in Table 4.3, are largely comparable to the results reported in Table 4.1; however, the individual point estimates are often not statistically significant, because they are derived from far fewer observations (only a single year of data, with the number of observations specified in the second column from the left).

In addition to validating the findings in Table 4.1, the results in Table 4.3 suggest that the key findings found in Table 4.1 are driven in large part by the trade importance of U.S. external security commitments following World War II and the collapse of the Soviet Union. This is particularly true for the estimated effect of treaty commitments: The analysis of aggregated treaty data for 1960 and 1965 (comparing treaty commitments in 1955 and 1960, respectively, to trade data in 1960 and 1965) finds statistically significant estimates of the aggregated impacts of treaties (ranging from 1.06 to 2.22) that are, across the board, at least triple the impact estimated from using data for all years (the result of 0.34 reported in Table 4.1). Treaty relationships are similarly robust for 1995 (corresponding to treaty commitments in 1990 and to trade in 1995).

A second concern with our parameterization is that the log-linear structure of our parameterization ignores potential decreasing (or increasing) returns to scale. In order to test for this possible nonlinear relationship, we repeat the analysis presented in Table 4.1 and include linear and quadratic terms for each measure of external security commitments. This additional analysis (results not reported) provides no evidence of either decreasing or increasing returns to scale. However, the aggregate number of military personnel does exhibit a positive relationship with aggregate trade in this alternate specification.

When the analysis focuses on just the intensive component of trade—that is, excluding data with trade flows equal to zero—we find slightly different results (not reported).<sup>14</sup> The estimated impact of the total number of personnel becomes statistically significant, with a doubling of total personnel estimated to increase trade by 7 percent. Of the personnel results found in Table 4.1, only the estimated relationship of the number of U.S. Army personnel remains statistically significant, and the magnitude of that estimated relationship falls by roughly half. The relationship for the total number of treaties remains positive, but it becomes only marginally statistically significant.

<sup>13</sup> We thank C. Richard Neu for this suggestion.

<sup>14</sup> Focusing on just intensive trade eliminates just 83, or 1.3 percent, of the total observations. These 83 observations are distributed across 25 different nations. Some analysts focus on only the intensive-component of trade (e.g., Berger et al., 2013). Glick and Taylor (2010) find that the inclusion of the extensive effect has only a minor impact on the estimated trade impacts of war.

**Table 4.3**  
**Effect of Quinquennial Country-Specific Security Commitments on U.S. Bilateral Trade**

| Year | N   | U.S. Military Personnel |                 |                 |                 |                  | Treaties         |                               |                 |                  |                  |                            |                  |                 |                  |
|------|-----|-------------------------|-----------------|-----------------|-----------------|------------------|------------------|-------------------------------|-----------------|------------------|------------------|----------------------------|------------------|-----------------|------------------|
|      |     | All                     | Air Force       | Navy            | Marine Corps    | Army             | All              | Noneconomic Security Treaties |                 |                  |                  | Economic Security Treaties |                  |                 |                  |
|      |     |                         |                 |                 |                 |                  |                  | Total                         | Access          | Admin            | Guarantees       | Operational                | Total            | Financial       | Materiel         |
| 1960 | 68  | 0.36<br>(0.19)          | 0.28<br>(0.18)  | 0.42<br>(0.26)  | 0.27<br>(0.25)  | 0.28<br>(0.17)   | 2.22**<br>(0.72) | 1.89**<br>(0.64)              | 1.29<br>(0.77)  | 1.87*<br>(0.87)  | 2.07**<br>(0.50) | -0.88<br>(0.78)            | 1.64*<br>(0.76)  | 1.18<br>(0.86)  | 1.38<br>(0.79)   |
| 1965 | 81  | 0.21*<br>(0.08)         | 0.23<br>(0.12)  | 0.21<br>(0.14)  | 0.20<br>(0.12)  | 0.21**<br>(0.08) | 1.24*<br>(0.49)  | 1.59*<br>(0.67)               | 0.96*<br>(0.40) | 1.91<br>(1.09)   | 1.60**<br>(0.44) | 0.26<br>(0.60)             | 1.06*<br>(0.51)  | 0.89<br>(0.66)  | 1.01*<br>(0.46)  |
| 1970 | 91  | 0.16<br>(0.27)          | 0.41<br>(0.26)  | -0.09<br>(0.35) | -0.11<br>(0.40) | 0.36<br>(0.20)   | 1.03<br>(0.74)   | 0.41<br>(0.69)                | -0.09<br>(1.01) | 0.24<br>(0.69)   | 0.46<br>(0.89)   | 0.00<br>(0.62)             | 1.25<br>(0.80)   | 1.23<br>(0.77)  | 0.87<br>(0.72)   |
| 1975 | 100 | -0.14<br>(0.18)         | 0.12<br>(0.12)  | -0.25<br>(0.26) | -0.42<br>(0.39) | 0.11<br>(0.08)   | -0.17<br>(0.34)  | -0.38<br>(0.50)               | -0.40<br>(0.85) | -0.75<br>(0.48)  | -0.31<br>(0.84)  | -0.14<br>(0.43)            | -0.04<br>(0.22)  | -0.01<br>(0.24) | -0.10<br>(0.24)  |
| 1980 | 115 | -0.17<br>(0.18)         | -0.00<br>(0.08) | -0.27<br>(0.26) | -0.42<br>(0.35) | 0.10<br>(0.13)   | -0.07<br>(0.33)  | -0.37<br>(0.52)               | -0.21<br>(0.74) | -0.82<br>(0.45)  | -0.54<br>(1.09)  | -0.29<br>(0.44)            | 0.04<br>(0.17)   | 0.32<br>(0.20)  | -0.19<br>(0.22)  |
| 1985 | 128 | -0.18<br>(0.15)         | -0.11<br>(0.10) | -0.29<br>(0.19) | -0.27<br>(0.15) | 0.02<br>(0.11)   | 0.27<br>(0.26)   | -0.10<br>(0.36)               | -0.21<br>(0.61) | -0.34<br>(0.35)  | 0.36<br>(0.53)   | -0.47<br>(0.37)            | 0.39*<br>(0.19)  | 0.50<br>(0.26)  | 0.17<br>(0.21)   |
| 1990 | 139 | 0.08<br>(0.08)          | 0.03<br>(0.07)  | -0.03<br>(0.11) | -0.10<br>(0.13) | 0.18**<br>(0.07) | 0.25<br>(0.22)   | 0.07<br>(0.29)                | 0.38<br>(0.31)  | -0.31<br>(0.31)  | 0.11<br>(0.52)   | 0.06<br>(0.31)             | 0.31<br>(0.19)   | 0.24<br>(0.33)  | 0.36<br>(0.21)   |
| 1995 | 165 | 0.10<br>(0.06)          | 0.10<br>(0.05)  | 0.06<br>(0.09)  | 0.01<br>(0.08)  | 0.19**<br>(0.05) | 0.38**<br>(0.12) | 0.28<br>(0.17)                | 0.43<br>(0.26)  | -0.16<br>(0.31)  | 0.67*<br>(0.28)  | 0.26<br>(0.21)             | 0.43**<br>(0.12) | 0.45*<br>(0.23) | 0.46**<br>(0.12) |
| 2000 | 172 | 0.06<br>(0.08)          | 0.01<br>(0.08)  | -0.05<br>(0.10) | -0.08<br>(0.12) | 0.07<br>(0.09)   | 0.11<br>(0.13)   | 0.01<br>(0.13)                | 0.23<br>(0.29)  | -0.27<br>(0.14)  | 0.33<br>(0.27)   | 0.08<br>(0.17)             | 0.18<br>(0.16)   | 0.18<br>(0.20)  | 0.13<br>(0.15)   |
| 2005 | 176 | -0.03<br>(0.06)         | -0.05<br>(0.08) | -0.06<br>(0.08) | -0.01<br>(0.08) | -0.04<br>(0.07)  | 0.05<br>(0.12)   | -0.04<br>(0.13)               | 0.26<br>(0.23)  | -0.33*<br>(0.14) | 0.12<br>(0.20)   | 0.03<br>(0.15)             | 0.07<br>(0.14)   | 0.07<br>(0.18)  | 0.03<br>(0.14)   |

NOTE: All regressions include log(GDP) and log(GDP per capita) of the trading country.

\* = 5-percent significance; \*\* = 1-percent significance.

We next consider the potential effect of U.S. security commitments at the regional level. In Table 4.2, we report the estimates from an analogous set of regressions that use regional aggregates of the number of personnel and treaties, rather than country-specific numbers. The analysis is still conducted at the country level, because this table examines the extent to which these regional aggregates have country-specific effects. We find largely comparable results in this analysis, in that some personnel and treaty commitments at the regional level are still associated with increased trade; and although the effect of soldiers becomes zero, the total number of *economic* security treaties is now positive and significant.

In Chapter Eight, where we estimate the overall value of a 50-percent reduction in security commitments, our regression specification includes both the country-specific and regionally aggregated measures of security commitments (see Table 8.1). There, we find that the results in Tables 4.1 and 4.2 are robust to their joint specification in a regression.

## U.S. Imports Versus Exports

Our second analysis of U.S. bilateral trade disaggregates this trade into U.S. imports and U.S. exports. Although the engagement and retrenchment schools do not offer sharp predictions on how U.S. external security commitments may or may not affect imports and exports differently, Berger and colleagues found evidence that CIA interventionism supported U.S. exports, but not imports.<sup>15</sup> The results from our analysis, which explores the effects of country-specific and then regional aggregates of security commitments on imports and exports separately, are reported in Tables 4.4 and 4.5.

We find evidence that a country-specific U.S. security presence creates an export market, as was found for CIA interventionism.<sup>16</sup> However, while we find evidence at the country level that exports from the United States do increase with the number of security commitments, particularly treaty commitments (consistent with the findings of Berger and colleagues), we also find that the U.S. security presence may in fact be associated with a net trade deficit, given the statistically strong positive correlations between both types of security commitments and imports to the United States, both at the country and regional levels, as seen in Tables 4.4 and 4.5. Thus, our conclusion differs from the Berger team's conclusion, which states that "political influence, arising from CIA interventions during the Cold War, was used to create a larger foreign market for American products."<sup>17</sup> In contrast, we conclude that an even greater probable outcome was a larger American market for foreign products.

## Methodology

Our approach for measuring the potentially differing effects of U.S. security commitments on imports and exports also relies on a gravity model approach. The intuition for our parameterization follows Berger and colleagues, who used a gravity model to assess the effect of CIA

<sup>15</sup> Berger et al., 2013.

<sup>16</sup> Berger et al., 2013.

<sup>17</sup> Berger et al., 2013. The gravity model approach that we use for estimation does not allow us to directly estimate the relationship of overseas presence with net exports, because it is not possible to take logs of negative numbers.

**Table 4.4**  
Imports Versus Exports, Country-Specific Security Commitments

|                                | U.S. Military Personnel |           |        |              |        | Treaties |                               |        |        |            |                            |         |           |          |        |       |       |     |
|--------------------------------|-------------------------|-----------|--------|--------------|--------|----------|-------------------------------|--------|--------|------------|----------------------------|---------|-----------|----------|--------|-------|-------|-----|
|                                | All                     | Air Force | Navy   | Marine Corps | Army   | All      | Noneconomic Security Treaties |        |        |            | Economic Security Treaties |         |           |          |        |       |       |     |
|                                |                         |           |        |              |        |          | Total                         | Access | Admin  | Guarantees | Operational                | Total   | Financial | Materiel |        |       |       |     |
| Imports to the United States   | No. of personnel        | 0.23*     | 0.25*  | 0.20         | -0.01  | 0.27**   |                               |        |        |            |                            |         |           |          |        |       |       |     |
|                                |                         | (0.09)    | (0.10) | (0.12)       | (0.08) | (0.10)   |                               |        |        |            |                            |         |           |          |        |       |       |     |
|                                | No. of treaties         |           |        |              |        |          | 0.74**                        | 0.37   | -0.27  | 0.37       | 0.43                       | -0.66   | 0.72*     | -0.16    | 0.49   |       |       |     |
|                                |                         |           |        |              |        |          | (0.26)                        | (0.25) | (0.52) | (0.24)     | (0.34)                     | (0.36)  | (0.33)    | (0.52)   | (0.33) |       |       |     |
|                                | log(GDP)                | 3.16**    | 3.20** | 3.33**       | 3.41** | 3.23**   | 3.34**                        | 3.43** | 3.40** | 3.48**     | 3.60**                     | 3.41**  | 3.43**    | 3.41**   | 3.43** |       |       |     |
|                                |                         | (0.87)    | (0.88) | (0.87)       | (0.87) | (0.86)   | (0.86)                        | (0.87) | (0.86) | (0.87)     | (0.89)                     | (0.85)  | (0.86)    | (0.87)   | (0.87) |       |       |     |
|                                | log(GDP per capita)     | -0.39     | -0.42  | -0.51        | -0.57  | -0.47    | -0.59                         | -0.65  | -0.54  | -0.66      | -0.77                      | -0.51   | -0.63     | -0.58    | -0.65  |       |       |     |
|                                |                         | (0.86)    | (0.87) | (0.86)       | (0.86) | (0.85)   | (0.83)                        | (0.86) | (0.85) | (0.86)     | (0.89)                     | (0.85)  | (0.84)    | (0.86)   | (0.84) |       |       |     |
|                                | Year fixed effects?     | Yes       | Yes    | Yes          | Yes    | Yes      | Yes                           | Yes    | Yes    | Yes        | Yes                        | Yes     | Yes       | Yes      | Yes    | Yes   | Yes   | Yes |
|                                | Country fixed effects?  | Yes       | Yes    | Yes          | Yes    | Yes      | Yes                           | Yes    | Yes    | Yes        | Yes                        | Yes     | Yes       | Yes      | Yes    | Yes   | Yes   | Yes |
| T                              | 50                      | 50        | 50     | 50           | 50     | 50       | 50                            | 50     | 50     | 50         | 50                         | 50      | 50        | 50       | 50     | 50    | 50    |     |
| No. of countries               | 177                     | 177       | 177    | 177          | 177    | 177      | 177                           | 177    | 177    | 177        | 177                        | 177     | 177       | 177      | 177    | 177   | 177   |     |
| N                              | 6,363                   | 6,363     | 6,363  | 6,363        | 6,363  | 6,363    | 6,363                         | 6,363  | 6,363  | 6,363      | 6,363                      | 6,363   | 6,363     | 6,363    | 6,363  | 6,363 | 6,363 |     |
| Exports from the United States | No. of personnel        | 0.09      | 0.17** | 0.05         | -0.01  | 0.14*    |                               |        |        |            |                            |         |           |          |        |       |       |     |
|                                |                         | (0.07)    | (0.07) | (0.09)       | (0.06) | (0.06)   |                               |        |        |            |                            |         |           |          |        |       |       |     |
|                                | No. of treaties         |           |        |              |        |          | 0.34*                         | 0.07   | 0.15   | -0.00      | -0.02                      | -0.54** | 0.41      | -0.07    | 0.30   |       |       |     |
|                                |                         |           |        |              |        |          | (0.16)                        | (0.14) | (0.51) | (0.13)     | (0.20)                     | (0.21)  | (0.21)    | (0.30)   | (0.20) |       |       |     |
|                                | log(GDP)                | 0.93      | 0.89   | 1.02         | 1.04   | 0.94     | 1.01                          | 1.04   | 1.04   | 1.03       | 1.02                       | 1.04    | 1.05      | 1.04     | 1.05   |       |       |     |
|                                |                         | (0.59)    | (0.60) | (0.60)       | (0.60) | (0.60)   | (0.60)                        | (0.61) | (0.61) | (0.61)     | (0.64)                     | (0.60)  | (0.60)    | (0.61)   | (0.61) |       |       |     |
|                                | log(GDP per capita)     | 1.55**    | 1.58** | 1.50**       | 1.48** | 1.53**   | 1.47**                        | 1.47** | 1.47** | 1.48**     | 1.49**                     | 1.53**  | 1.45**    | 1.48**   | 1.43** |       |       |     |
|                                |                         | (0.53)    | (0.53) | (0.52)       | (0.53) | (0.52)   | (0.52)                        | (0.53) | (0.52) | (0.53)     | (0.56)                     | (0.53)  | (0.52)    | (0.52)   | (0.52) |       |       |     |
|                                | Year fixed effects?     | Yes       | Yes    | Yes          | Yes    | Yes      | Yes                           | Yes    | Yes    | Yes        | Yes                        | Yes     | Yes       | Yes      | Yes    | Yes   | Yes   | Yes |
|                                | Country fixed effects?  | Yes       | Yes    | Yes          | Yes    | Yes      | Yes                           | Yes    | Yes    | Yes        | Yes                        | Yes     | Yes       | Yes      | Yes    | Yes   | Yes   | Yes |
| T                              | 50                      | 50        | 50     | 50           | 50     | 50       | 50                            | 50     | 50     | 50         | 50                         | 50      | 50        | 50       | 50     | 50    | 50    |     |
| No. of countries               | 177                     | 177       | 177    | 177          | 177    | 177      | 177                           | 177    | 177    | 177        | 177                        | 177     | 177       | 177      | 177    | 177   | 177   |     |
| N                              | 6,363                   | 6,363     | 6,363  | 6,363        | 6,363  | 6,363    | 6,363                         | 6,363  | 6,363  | 6,363      | 6,363                      | 6,363   | 6,363     | 6,363    | 6,363  | 6,363 | 6,363 |     |

\* = 5-percent significance; \*\* = 1-percent significance. Standard errors reflect clustering at the country level. Regional clustering provides similar results.



**Table 4.5**  
**Imports Versus Exports, Regional Security Commitment Aggregates**

|                              | U.S. Military Personnel        |                  |                  |                  |                  | Treaties         |                               |                  |                   |                  |                            |                  |                  |                  |                  |       |       |       |       |
|------------------------------|--------------------------------|------------------|------------------|------------------|------------------|------------------|-------------------------------|------------------|-------------------|------------------|----------------------------|------------------|------------------|------------------|------------------|-------|-------|-------|-------|
|                              | All                            | Air Force        | Navy             | Marine Corps     | Army             | All              | Noneconomic Security Treaties |                  |                   |                  | Economic Security Treaties |                  |                  |                  |                  |       |       |       |       |
|                              |                                |                  |                  |                  |                  |                  | Total                         | Access           | Admin             | Guarantees       | Operational                | Total            | Financial        | Materiel         |                  |       |       |       |       |
| Imports to the United States | No. of personnel               | 0.44**<br>(0.11) | 0.44**<br>(0.14) | 0.43**<br>(0.16) | 0.52**<br>(0.10) | 0.18*<br>(0.08)  |                               |                  |                   |                  |                            |                  |                  |                  |                  |       |       |       |       |
|                              | No. of treaties                |                  |                  |                  |                  |                  | 0.81**<br>(0.24)              | 0.40<br>(0.21)   | -1.65**<br>(0.40) | 0.38<br>(0.20)   | 0.31<br>(0.25)             | 0.05<br>(0.23)   | 0.97**<br>(0.24) | 1.56**<br>(0.45) | 0.93**<br>(0.22) |       |       |       |       |
|                              | log(GDP)                       | 3.37**<br>(0.84) | 3.56**<br>(0.87) | 3.67**<br>(0.91) | 2.53**<br>(0.75) | 3.46**<br>(0.88) | 3.22**<br>(0.82)              | 3.31**<br>(0.85) | 3.85**<br>(0.84)  | 3.37**<br>(0.86) | 3.53**<br>(0.91)           | 3.38**<br>(0.91) | 3.33**<br>(0.82) | 2.92**<br>(0.78) | 3.28**<br>(0.81) |       |       |       |       |
|                              | log(GDP per capita)            | -0.36<br>(0.82)  | -0.62<br>(0.86)  | -0.71<br>(0.89)  | 0.77<br>(0.73)   | -0.58<br>(0.86)  | -0.25<br>(0.81)               | -0.47<br>(0.85)  | -0.82<br>(0.83)   | -0.53<br>(0.85)  | -0.75<br>(0.92)            | -0.53<br>(0.94)  | -0.21<br>(0.79)  | 0.31<br>(0.75)   | -0.18<br>(0.79)  |       |       |       |       |
|                              | Year fixed effects?            | Yes              | Yes              | Yes              | Yes              | Yes              | Yes                           | Yes              | Yes               | Yes              | Yes                        | Yes              | Yes              | Yes              | Yes              | Yes   | Yes   | Yes   |       |
|                              | Country fixed effects?         | Yes              | Yes              | Yes              | Yes              | Yes              | Yes                           | Yes              | Yes               | Yes              | Yes                        | Yes              | Yes              | Yes              | Yes              | Yes   | Yes   | Yes   | Yes   |
|                              | T                              | 50               | 50               | 50               | 50               | 50               | 50                            | 50               | 50                | 50               | 50                         | 50               | 50               | 50               | 50               | 50    | 50    | 50    | 50    |
|                              | No. of countries               | 177              | 177              | 177              | 177              | 177              | 177                           | 177              | 177               | 177              | 177                        | 177              | 177              | 177              | 177              | 177   | 177   | 177   | 177   |
|                              | N                              | 6,363            | 6,363            | 6,363            | 6,363            | 6,363            | 6,363                         | 6,363            | 6,363             | 6,363            | 6,363                      | 6,363            | 6,363            | 6,363            | 6,363            | 6,363 | 6,363 | 6,363 | 6,363 |
|                              | Exports from the United States | No. of personnel | 0.07<br>(0.06)   | 0.17*<br>(0.07)  | 0.01<br>(0.09)   | 0.04<br>(0.05)   | -0.02<br>(0.05)               |                  |                   |                  |                            |                  |                  |                  |                  |       |       |       |       |
| No. of treaties              |                                |                  |                  |                  |                  |                  | 0.14<br>(0.10)                | 0.10<br>(0.13)   | -0.21<br>(0.22)   | -0.03<br>(0.12)  | -0.15<br>(0.18)            | 0.49**<br>(0.18) | 0.15<br>(0.10)   | 0.30<br>(0.27)   | 0.13<br>(0.11)   |       |       |       |       |
| log(GDP)                     |                                | 1.03<br>(0.61)   | 1.09<br>(0.61)   | 1.04<br>(0.61)   | 0.96<br>(0.61)   | 1.03<br>(0.61)   | 1.00<br>(0.60)                | 1.01<br>(0.59)   | 1.09<br>(0.60)    | 1.04<br>(0.61)   | 0.97<br>(0.64)             | 0.74<br>(0.63)   | 1.02<br>(0.60)   | 0.94<br>(0.64)   | 1.02<br>(0.60)   |       |       |       |       |
| log(GDP per capita)          |                                | 1.51**<br>(0.52) | 1.46**<br>(0.52) | 1.48**<br>(0.54) | 1.59**<br>(0.51) | 1.48**<br>(0.53) | 1.54**<br>(0.52)              | 1.50**<br>(0.52) | 1.45**<br>(0.54)  | 1.48**<br>(0.52) | 1.57**<br>(0.58)           | 1.84**<br>(0.60) | 1.54**<br>(0.52) | 1.65**<br>(0.55) | 1.53**<br>(0.52) |       |       |       |       |
| Year fixed effects?          |                                | Yes              | Yes              | Yes              | Yes              | Yes              | Yes                           | Yes              | Yes               | Yes              | Yes                        | Yes              | Yes              | Yes              | Yes              | Yes   | Yes   | Yes   | Yes   |
| Country fixed effects?       |                                | Yes              | Yes              | Yes              | Yes              | Yes              | Yes                           | Yes              | Yes               | Yes              | Yes                        | Yes              | Yes              | Yes              | Yes              | Yes   | Yes   | Yes   | Yes   |
| T                            |                                | 50               | 50               | 50               | 50               | 50               | 50                            | 50               | 50                | 50               | 50                         | 50               | 50               | 50               | 50               | 50    | 50    | 50    | 50    |
| No. of countries             |                                | 177              | 177              | 177              | 177              | 177              | 177                           | 177              | 177               | 177              | 177                        | 177              | 177              | 177              | 177              | 177   | 177   | 177   | 177   |
| N                            |                                | 6,363            | 6,363            | 6,363            | 6,363            | 6,363            | 6,363                         | 6,363            | 6,363             | 6,363            | 6,363                      | 6,363            | 6,363            | 6,363            | 6,363            | 6,363 | 6,363 | 6,363 | 6,363 |

\* = 5-percent significance, \*\* = 1-percent significance. Standard errors reflect clustering at the country level. Regional clustering provides similar results.

interventions on U.S. imports and exports; specifically, our approach follows that used in their Table 1.<sup>18</sup>

Our specific parameterization is a slightly more flexible version of the approach used by Berger and colleagues in that we focus on the following estimation:<sup>19</sup>

$$\ln(M_{it} + 1) \text{ or } \ln(X_{it} + 1) = \alpha \ln(S_{i,t-5} + 1) + \gamma_1 \ln(Y_{it}) + \gamma_2 \ln\left(\frac{Y_{it}}{P_{it}}\right) + \delta_i + \eta_t + \varepsilon_{it},$$

where all the notations and variables are analogous to those provided for Equation 1. The outcome variable is now either the imports to the United States ( $M_{it}$ ) or exports from the United States ( $X_{it}$ ). Reported standard errors are again clustered at the country level.

There are two additional differences between our approach and that used by Berger and colleagues.<sup>20</sup> First, as before, we add in an additional set of regressions that includes country-year observations with zero trade; Berger and colleagues exclude these observations across all of their specifications, as far as we can tell. This again allows us to explore the effects of U.S. external security commitments on both the intensive and extensive margins. Second, the set of covariates that we consider is significantly simplified; we do not include the various political variables considered by these authors.

### Results for Imports Versus Exports

The analysis of country-specific commitments on imports to and exports from the United States, reported in Table 4.4, finds that security commitments have qualitatively similar results on both imports and exports; indeed, we find that both imports and exports increase with the numbers of personnel and treaties. Thus, unlike the analysis of Berger and colleagues, we find that external security commitments exhibit a positive and statistically significant relationship with imports to the United States. Further, our estimates suggest that the effect of these security commitments is larger for imports to the United States—approximately twice as large as for exports—suggesting that these security commitments, on net, increase the U.S. trade deficit.

When the analysis focuses on just the intensive impact of security commitments on imports and exports—that is, excluding data with imports or exports equal to zero—we find largely analogous results (not reported). In the analysis of imports to the United States, the estimates for personnel commitments all now become positive, although only the estimated effect

<sup>18</sup> Berger and colleagues (2013) focus on the estimation of

$$\ln\left(\frac{M_{it}}{Y_{it}}\right) = \alpha \ln(S_{i,t-5} + 1) + \gamma_1 \ln\left(\frac{Y_{it}}{P_{it}}\right) + X_{it} + \delta_i + \eta_t + \varepsilon_{it},$$

with notation and variables analogous to that provided for Equation 1, early in this chapter. The only major difference is Berger and colleagues' inclusion of  $X_{it}$ , a set of additional political control variables of specific interest for their analysis.

<sup>19</sup> The difference in the parameterization is that Berger and colleagues (2013) assume that  $\gamma = 1$ . We use this more flexible parameterization because the parameterization used by Berger and colleagues does not seem to perform well for data that include zero imports or exports. Specifically, while our coefficient estimates of “ln per capita income” are comparable to those presented in their Table 1 for imports from the United States if observations with zero imports are excluded, these point estimates are dramatically different when these data points are included.

<sup>20</sup> These two differences are discussed in more detail in the next section.

of soldiers remains statistically significant (with a point estimate that is roughly equivalent). The estimated effect of treaties on imports falls by more than half, but it remains statistically significant. And in the analysis of exports, excluding data points with no exports from the United States, the only statistically significant results are for the total number of personnel and the number of marines; in both cases, the point estimates are positive.

The most dramatic result illustrated in Table 4.5, which explores the relationship between U.S. external security commitments at the regional level and imports to and exports from the United States, is that these commitments have a large and significant impact on imports to the United States. Both the total number of military personnel and the total number of treaties have a significant positive impact on imports to the United States, with a doubling of personnel anticipated to increase imports by nearly 45 percent and a doubling of treaties anticipated to increase imports by more than 80 percent. By comparison, the effects of these regional commitments on exports from the United States, though generally still positive, are much smaller and rarely significant.

### **Summary of Findings for U.S. Bilateral Trade**

Summing up, there is evidence that security commitments are related to increased bilateral trade. The signs of coefficients are stable, and when coefficients are significant, they are generally positive. For country-specific commitments, we find that the overall number of treaties, the number of soldiers, and the number of airmen are associated with increased imports, exports, and overall bilateral trade with that country. For region-specific commitments, we find that both personnel and treaty commitments are strongly associated with increased imports to the United States, but that the relationship with exports from the United States, and consequently the overall relationship, is more tenuous. On net, however, we believe that these quantitative results provide strong support for the predictions of the engagement school.



## Global Bilateral Trade

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The engagement and retrenchment schools also provide different predictions on the relationship between the security commitments of the hegemon—in our case, the United States—and global bilateral trade. Specifically, although the hegemonic reassurance theory remains agnostic on this issue, both the hegemonic public goods and hegemonic influence theories predict that global bilateral trade will increase with the intensity of U.S. security commitments. Conversely, the retrenchment school again predicts that these security commitments will have no, or limited, effect on global bilateral trade.

Our analysis of global bilateral trade, which we believe is the first to explore its potential relationship with the intensity of U.S. security commitments, provides strong evidence that U.S. security commitments do encourage global trade, as argued by the engagement school. We find that U.S. security commitments have a positive, strong, and statistically significant relationship with global bilateral trade flows. Our estimates suggest that a doubling of personnel commitments could increase global trade by as much as 10 percent, and that doubling the number of treaties might expand global trade by more than 50 percent.

### Methodology

We explore how U.S. external security commitments influence global bilateral trade, again using the gravity model of trade.<sup>1</sup> Our analytical approach follows Glick and Taylor closely.<sup>2</sup> In addition to relying on their publicly available data set (we simply augment this data set with our measures of security commitments), our estimation strategy is analogous to theirs.<sup>3</sup> Specifically, our empirical specification mirrors Column 1 of Table 2 in Glick and Taylor,<sup>4</sup> in that we estimate the relationship between security commitments and trade as

$$\ln(T_{ijt}) = \alpha \ln(S_{i,t-5} S_{j,t-5} + 1) + \gamma_1 \ln(Y_{it} \cdot Y_{jt}) + \gamma_2 \ln\left(\frac{Y_{it}}{P_{it}} \cdot \frac{Y_{jt}}{P_{jt}}\right) + X_{ijt} + \delta_{ij} + \eta_t + \varepsilon_{ijt},$$

<sup>1</sup> See, for example, Anderson and van Wincoop, 2003.

<sup>2</sup> Glick and Taylor, 2010.

<sup>3</sup> Their data spans 1870–1997, but our unified data set is restricted to 1955–1997 because we rely on five-year lags (Chapter Three), and the security commitment data was first available in 1950.

<sup>4</sup> Glick and Taylor, 2010.

where  $i$  and  $j$  denote countries and  $t$  denotes year. The dependent variable in this analysis,  $\ln(T_{ijt})$ , is the log of aggregate bilateral trade; again, as in Chapter Four, we consider analysis that includes and excludes observations with zero trade.

The explanatory variable of focus in this analysis,  $\ln(S_{i,t-5} S_{j,t-5} + 1)$ , is the five-year lagged product of security commitments in the two trading countries (trading pairs of countries are called “dyads”). This parameterization of U.S. security commitments captures two effects: (1) overall increases in global trade associated with increased U.S. security commitments in a given country and (2) increases attributable to the product of the number of U.S. security commitments.<sup>5</sup> Other explanatory variables are as follows:

1.  $\ln(Y_{it} \cdot Y_{jt})$ : log product of the trading partners’ GDP
2.  $\ln\left(\frac{Y_{it}}{P_{it}} \cdot \frac{Y_{jt}}{P_{jt}}\right)$ : log product of the trading partners’ GDP per capita
3.  $X_{ijt}$ : other controls, including binary variables for whether the country-pair is at war or was at war during the past ten years (total of 11 controls), whether one country is a colony of the other, and whether the countries are in a currency union<sup>6</sup>
4.  $\delta_{ij}$ : country-pair dyad fixed effects
5.  $\eta_t$ : year fixed effects
6.  $\varepsilon_{ijt}$ : error term assumed to be independent and identically distributed across, but not within, region dyads.

## Results

We first explore the effect of the country-specific presence of U.S. forces and treaties. We focus on measuring the relationship between global bilateral trade and each type of security commitment introduced in Chapter Two. A positive coefficient indicates that those security commitments encourage global bilateral trade, while a negative coefficient indicates an inhibitive effect.

The results from this analysis are summarized in Table 5.1. Point estimates for our measures of security commitments are reported in the first two columns; as before, the 14 columns correspond to our 14 different measures of security commitments. Each regression includes 43 years of data (1955–1997) and nearly 11,000 country-pair dyads.

Three key results emerge from Table 5.1. The first, illustrated in the first and sixth columns of the top half of the table, is that global bilateral trade is increasing along with the total number of U.S. personnel and security treaties at the country level. The value of the security commitment variables that are inputted into the regression analysis for each dyad is the number of security commitments in the first trading partner in that dyad multiplied by the number of

<sup>5</sup> An alternative approach would include  $\ln(S_{i,t-5} S_{j,t-5} + 1)$ ,  $\ln(S_{i,t-5} + 1)$ , and  $\ln(S_{j,t-5} + 1)$  as regressors and then report an aggregate of the point estimates on each of the regressors. This regression would be difficult to interpret because the second two regressors would be providing point estimates of the same population parameter based on different sample populations (with this difference determined by the order of the dyads in the data). However, these two approaches do not give qualitatively different results.

<sup>6</sup> Given the inclusion of country-pair dyad fixed effects, only variables that vary within the sample period can be used.

**Table 5.1**  
**Effect of Country-Specific Security Commitments on Global Bilateral Trade**

|                              | U.S. Military Personnel |                   |                   |                   |                   | Treaties          |                               |                   |                   |                   |                            |                   |                   |                   |  |
|------------------------------|-------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------------------|-------------------|-------------------|-------------------|----------------------------|-------------------|-------------------|-------------------|--|
|                              | All                     | Air Force         | Navy              | Marine Corps      | Army              | All               | Noneconomic Security Treaties |                   |                   |                   | Economic Security Treaties |                   |                   |                   |  |
|                              |                         |                   |                   |                   |                   |                   | Total                         | Access            | Admin             | Guarantees        | Operational                | Total             | Financial         | Material          |  |
| Log product no. of personnel | 0.05**<br>(0.01)        | 0.03**<br>(0.01)  | 0.01<br>(0.01)    | -0.05**<br>(0.01) | 0.06**<br>(0.01)  |                   |                               |                   |                   |                   |                            |                   |                   |                   |  |
| Log product no. of treaties  |                         |                   |                   |                   |                   | 0.29**<br>(0.02)  | 0.11**<br>(0.03)              | 0.08<br>(0.10)    | 0.04<br>(0.07)    | 0.05<br>(0.06)    | -0.52**<br>(0.05)          | 0.23**<br>(0.03)  | 0.03<br>(0.06)    | 0.17**<br>(0.03)  |  |
| War                          | -3.72*<br>(1.72)        | -3.75*<br>(1.74)  | -3.74*<br>(1.75)  | -3.74*<br>(1.76)  | -3.70*<br>(1.72)  | -3.68*<br>(1.71)  | -3.73*<br>(1.74)              | -3.74*<br>(1.75)  | -3.73*<br>(1.75)  | -3.74*<br>(1.75)  | -3.75*<br>(1.76)           | -3.77*<br>(1.72)  | -3.74*<br>(1.75)  | -3.77*<br>(1.73)  |  |
| War1                         | -3.47**<br>(0.86)       | -3.45**<br>(0.86) | -3.43**<br>(0.86) | -3.40**<br>(0.86) | -3.45**<br>(0.86) | -3.43**<br>(0.85) | -3.42**<br>(0.86)             | -3.42**<br>(0.86) | -3.42**<br>(0.86) | -3.42**<br>(0.86) | -3.40**<br>(0.87)          | -3.53**<br>(0.86) | -3.43**<br>(0.86) | -3.49**<br>(0.86) |  |
| War2                         | -3.35**<br>(0.76)       | -3.38**<br>(0.76) | -3.38**<br>(0.76) | -3.37**<br>(0.76) | -3.34**<br>(0.76) | -3.49**<br>(0.76) | -3.40**<br>(0.76)             | -3.38**<br>(0.76) | -3.38**<br>(0.76) | -3.38**<br>(0.76) | -3.34**<br>(0.76)          | -3.55**<br>(0.76) | -3.40**<br>(0.76) | -3.47**<br>(0.76) |  |
| War3                         | -3.33**<br>(0.71)       | -3.29**<br>(0.71) | -3.28**<br>(0.71) | -3.27**<br>(0.71) | -3.29**<br>(0.71) | -3.35**<br>(0.71) | -3.28**<br>(0.71)             | -3.27**<br>(0.71) | -3.27**<br>(0.71) | -3.27**<br>(0.71) | -3.23**<br>(0.71)          | -3.42**<br>(0.71) | -3.28**<br>(0.71) | -3.35**<br>(0.71) |  |
| War4                         | -1.23<br>(0.68)         | -1.22<br>(0.68)   | -1.21<br>(0.68)   | -1.21<br>(0.68)   | -1.21<br>(0.68)   | -1.22<br>(0.68)   | -1.21<br>(0.68)               | -1.20<br>(0.68)   | -1.20<br>(0.68)   | -1.20<br>(0.68)   | -1.17<br>(0.68)            | -1.30<br>(0.68)   | -1.21<br>(0.68)   | -1.26<br>(0.68)   |  |
| War5                         | -2.97**<br>(0.65)       | -3.01**<br>(0.65) | -3.01**<br>(0.65) | -3.03**<br>(0.65) | -2.96**<br>(0.65) | -3.03**<br>(0.65) | -3.02**<br>(0.65)             | -3.02**<br>(0.65) | -3.02**<br>(0.65) | -3.02**<br>(0.65) | -2.99**<br>(0.65)          | -3.11**<br>(0.65) | -3.02**<br>(0.65) | -3.07**<br>(0.65) |  |
| War6                         | -2.38**<br>(0.64)       | -2.43**<br>(0.64) | -2.43**<br>(0.64) | -2.46**<br>(0.64) | -2.38**<br>(0.64) | -2.43**<br>(0.65) | -2.44**<br>(0.64)             | -2.44**<br>(0.64) | -2.44**<br>(0.64) | -2.44**<br>(0.64) | -2.41**<br>(0.64)          | -2.51**<br>(0.64) | -2.44**<br>(0.64) | -2.48**<br>(0.64) |  |
| War7                         | -1.26*<br>(0.58)        | -1.31*<br>(0.58)  | -1.32*<br>(0.58)  | -1.34*<br>(0.58)  | -1.27*<br>(0.58)  | -1.33*<br>(0.58)  | -1.32*<br>(0.58)              | -1.32*<br>(0.58)  | -1.32*<br>(0.58)  | -1.32*<br>(0.58)  | -1.30*<br>(0.58)           | -1.38*<br>(0.58)  | -1.33*<br>(0.58)  | -1.35*<br>(0.58)  |  |
| War8                         | -2.22**<br>(0.57)       | -2.26**<br>(0.57) | -2.27**<br>(0.57) | -2.29**<br>(0.57) | -2.23**<br>(0.57) | -2.30**<br>(0.58) | -2.28**<br>(0.57)             | -2.28**<br>(0.57) | -2.28**<br>(0.57) | -2.28**<br>(0.57) | -2.26**<br>(0.57)          | -2.34**<br>(0.57) | -2.28**<br>(0.57) | -2.31**<br>(0.57) |  |

Table 5.1—Continued

|                             | U.S. Military Personnel |           |         |              |         | Treaties |                               |         |         |            |                            |         |           |          |
|-----------------------------|-------------------------|-----------|---------|--------------|---------|----------|-------------------------------|---------|---------|------------|----------------------------|---------|-----------|----------|
|                             | All                     | Air Force | Navy    | Marine Corps | Army    | All      | Noneconomic Security Treaties |         |         |            | Economic Security Treaties |         |           |          |
|                             |                         |           |         |              |         |          | Total                         | Access  | Admin   | Guarantees | Operational                | Total   | Financial | Material |
| War9                        | -1.62*                  | -1.67**   | -1.68** | -1.70**      | -1.64*  | -1.67**  | -1.68**                       | -1.68** | -1.68** | -1.68**    | -1.67**                    | -1.72** | -1.69**   | -1.71**  |
|                             | (0.64)                  | (0.64)    | (0.64)  | (0.64)       | (0.64)  | (0.64)   | (0.64)                        | (0.64)  | (0.64)  | (0.64)     | (0.64)                     | (0.64)  | (0.64)    | (0.64)   |
| War10                       | 0.38                    | 0.38      | 0.37    | 0.33         | 0.38    | 0.53     | 0.41                          | 0.37    | 0.37    | 0.37       | 0.32                       | 0.50    | 0.38      | 0.46     |
|                             | (0.34)                  | (0.35)    | (0.35)  | (0.34)       | (0.34)  | (0.35)   | (0.35)                        | (0.35)  | (0.35)  | (0.35)     | (0.34)                     | (0.35)  | (0.35)    | (0.35)   |
| Log product GDP             | 1.90**                  | 1.92**    | 1.92**  | 1.92**       | 1.91**  | 1.98**   | 1.95**                        | 1.93**  | 1.93**  | 1.93**     | 1.85**                     | 1.94**  | 1.93**    | 1.94**   |
|                             | (0.12)                  | (0.12)    | (0.12)  | (0.12)       | (0.12)  | (0.12)   | (0.12)                        | (0.12)  | (0.12)  | (0.12)     | (0.12)                     | (0.12)  | (0.12)    | (0.12)   |
| Log product GDP per capita  | -0.11                   | -0.13     | -0.13   | -0.13        | -0.13   | -0.22*   | -0.17                         | -0.14   | -0.14   | -0.14      | -0.03                      | -0.17   | -0.14     | -0.16    |
|                             | (0.11)                  | (0.11)    | (0.11)  | (0.11)       | (0.11)  | (0.11)   | (0.11)                        | (0.11)  | (0.11)  | (0.11)     | (0.12)                     | (0.11)  | (0.11)    | (0.11)   |
| Current colony              | -2.80**                 | -2.86**   | -2.86** | -2.85**      | -2.83** | -2.48*   | -2.82**                       | -2.84** | -2.86** | -2.86**    | -2.84**                    | -2.67** | -2.86**   | -2.76**  |
|                             | (0.96)                  | (0.96)    | (0.96)  | (0.96)       | (0.96)  | (0.97)   | (0.97)                        | (0.97)  | (0.96)  | (0.96)     | (0.96)                     | (0.97)  | (0.96)    | (0.96)   |
| Currency union              | 0.64                    | 0.66      | 0.65    | 0.66         | 0.64    | 0.63     | 0.64                          | 0.65    | 0.65    | 0.65       | 0.69                       | 0.64    | 0.65      | 0.63     |
|                             | (0.40)                  | (0.40)    | (0.40)  | (0.40)       | (0.40)  | (0.40)   | (0.40)                        | (0.40)  | (0.40)  | (0.40)     | (0.40)                     | (0.40)  | (0.40)    | (0.40)   |
| Year fixed effects?         | Yes                     | Yes       | Yes     | Yes          | Yes     | Yes      | Yes                           | Yes     | Yes     | Yes        | Yes                        | Yes     | Yes       | Yes      |
| Country-dyad fixed effects? | Yes                     | Yes       | Yes     | Yes          | Yes     | Yes      | Yes                           | Yes     | Yes     | Yes        | Yes                        | Yes     | Yes       | Yes      |
| <i>T</i>                    | 43                      | 43        | 43      | 43           | 43      | 43       | 43                            | 43      | 43      | 43         | 43                         | 43      | 43        | 43       |
| No. of dyads                | 10,933                  | 10,933    | 10,933  | 10,933       | 10,933  | 10,933   | 10,933                        | 10,933  | 10,933  | 10,933     | 10,933                     | 10,933  | 10,933    | 10,933   |
| <i>N</i>                    | 318,731                 | 318,731   | 318,731 | 318,731      | 318,731 | 318,731  | 318,731                       | 318,731 | 318,731 | 318,731    | 318,731                    | 318,731 | 318,731   | 318,731  |

\* = 5-percent significance; \*\* = 1-percent significance. Standard errors reflect clustering at the country-dyad level.



security commitments in the second trading partner in that dyad. For this reason, we need to double the point estimates in Table 5.1 in interpreting any across-the-board changes in U.S. security commitments (as these changes will affect the number of security commitments in both countries). Therefore, the point estimate for the overall numbers of security forces—an estimate of 0.05 that is statistically significant at the 1-percent level—suggests that global bilateral trade would increase by 10 percent if the U.S. external force presence doubled. Similarly, the point estimate of 0.29 for treaties suggests that global bilateral trade would increase by some 58 percent if the United States doubled its treaty commitments.

The second key result is that the numbers of Air Force and Army personnel are the primary type of deployed personnel that influence overall global trade, which is similar to the effect observed for bilateral trade in the previous section. A doubling of the number of airmen would be met with a 6-percent increase in global bilateral trade; a doubling of soldiers would be met with a 12-percent increase in such trade.

The analysis of only the intensive effects of security commitments on global bilateral trade—which excludes any effects on new trading relationships—provides very different results (not reported). Unlike the results presented in Table 5.1, only the numbers of sailors and marines (among the personnel commitments) have statistically significant effects. Both are positive, indicating that the numbers of marines and sailors increase the intensity of trade between countries with established trading relationships. Although many individual types of treaty commitments still exhibit a positive relationship with global bilateral trade, none of the three aggregated measures of treaty commitments is statistically significant when analyzing only the intensive effects.

The results of the regional analysis, which replaces the country-specific measures of security commitments with regional aggregates, are reported in Table 5.2. Here, we again find robust positive relationships between global bilateral trade and the regional numbers of both personnel and treaties. While the regional analysis finds a similar effect for the overall number of troops, it is now driven by the numbers of airmen and sailors (rather than airmen and soldiers, as in the country-specific analysis). In the analogous analysis of only the intensive effect of regional commitments (not reported), the estimated effect of the number of personnel also remains roughly the same. In contrast, the treaty commitments are estimated to have no meaningful impact, based on the analysis of the intensive effect alone.

**Table 5.2**  
**Effect of Regional Security Commitments on Global Bilateral Trade**

|                              | U.S. Military Personnel |                   |                   |                   |                   | Treaties          |                               |                   |                   |                   |                            |                   |                   |                   |  |
|------------------------------|-------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------------------|-------------------|-------------------|-------------------|----------------------------|-------------------|-------------------|-------------------|--|
|                              | All                     | Air Force         | Navy              | Marine Corps      | Army              | All               | Noneconomic Security Treaties |                   |                   |                   | Economic Security Treaties |                   |                   |                   |  |
|                              |                         |                   |                   |                   |                   |                   | Total                         | Access            | Admin             | Guarantees        | Operational                | Total             | Financial         | Material          |  |
| Log product no. of personnel | 0.08**<br>(0.02)        | 0.11**<br>(0.02)  | 0.07**<br>(0.01)  | 0.00<br>(0.00)    | -0.01<br>(0.01)   |                   |                               |                   |                   |                   |                            |                   |                   |                   |  |
| Log product no. of treaties  |                         |                   |                   |                   |                   | 0.11**<br>(0.02)  | 0.16**<br>(0.03)              | 0.03**<br>(0.01)  | 0.05*<br>(0.02)   | 0.02**<br>(0.01)  | 0.05**<br>(0.01)           | 0.06*<br>(0.03)   | -0.04**<br>(0.01) | 0.06*<br>(0.03)   |  |
| War                          | -3.76*<br>(1.74)        | -3.75*<br>(1.72)  | -3.79*<br>(1.75)  | -3.74*<br>(1.75)  | -3.73*<br>(1.75)  | -3.69*<br>(1.75)  | -3.66*<br>(1.75)              | -3.75*<br>(1.74)  | -3.72*<br>(1.75)  | -3.64*<br>(1.75)  | -3.63*<br>(1.78)           | -3.73*<br>(1.75)  | -3.66*<br>(1.75)  | -3.72*<br>(1.75)  |  |
| War1                         | -3.44**<br>(0.86)       | -3.44**<br>(0.87) | -3.45**<br>(0.86) | -3.43**<br>(0.86) | -3.42**<br>(0.86) | -3.37**<br>(0.86) | -3.32**<br>(0.86)             | -3.45**<br>(0.86) | -3.40**<br>(0.86) | -3.29**<br>(0.86) | -3.23**<br>(0.86)          | -3.42**<br>(0.86) | -3.37**<br>(0.86) | -3.40**<br>(0.86) |  |
| War2                         | -3.36**<br>(0.76)       | -3.39**<br>(0.76) | -3.38**<br>(0.75) | -3.39**<br>(0.76) | -3.39**<br>(0.76) | -3.33**<br>(0.76) | -3.29**<br>(0.76)             | -3.40**<br>(0.76) | -3.36**<br>(0.76) | -3.37**<br>(0.76) | -3.25**<br>(0.76)          | -3.39**<br>(0.76) | -3.28**<br>(0.76) | -3.37**<br>(0.76) |  |
| War3                         | -3.20**<br>(0.72)       | -3.15**<br>(0.72) | -3.23**<br>(0.71) | -3.26**<br>(0.71) | -3.28**<br>(0.71) | -3.22**<br>(0.71) | -3.18**<br>(0.71)             | -3.29**<br>(0.71) | -3.25**<br>(0.71) | -3.26**<br>(0.71) | -3.20**<br>(0.71)          | -3.27**<br>(0.71) | -3.17**<br>(0.71) | -3.26**<br>(0.71) |  |
| War4                         | -1.15<br>(0.68)         | -1.11<br>(0.68)   | -1.18<br>(0.68)   | -1.20<br>(0.68)   | -1.22<br>(0.68)   | -1.17<br>(0.68)   | -1.14<br>(0.68)               | -1.23<br>(0.68)   | -1.19<br>(0.68)   | -1.19<br>(0.68)   | -1.16<br>(0.68)            | -1.20<br>(0.68)   | -1.18<br>(0.68)   | -1.19<br>(0.68)   |  |
| War5                         | -3.05**<br>(0.65)       | -3.06**<br>(0.65) | -3.03**<br>(0.65) | -3.03**<br>(0.65) | -3.02**<br>(0.65) | -2.98**<br>(0.65) | -2.96**<br>(0.65)             | -3.04**<br>(0.65) | -3.01**<br>(0.65) | -3.00**<br>(0.65) | -2.97**<br>(0.65)          | -3.01**<br>(0.65) | -2.99**<br>(0.65) | -3.00**<br>(0.65) |  |
| War6                         | -2.46**<br>(0.64)       | -2.49**<br>(0.64) | -2.46**<br>(0.64) | -2.44**<br>(0.64) | -2.44**<br>(0.64) | -2.41**<br>(0.64) | -2.39**<br>(0.64)             | -2.46**<br>(0.64) | -2.42**<br>(0.64) | -2.43**<br>(0.64) | -2.41**<br>(0.64)          | -2.44**<br>(0.64) | -2.42**<br>(0.64) | -2.43**<br>(0.64) |  |
| War7                         | -1.35*<br>(0.58)        | -1.39*<br>(0.58)  | -1.34*<br>(0.58)  | -1.32*<br>(0.58)  | -1.32*<br>(0.58)  | -1.30*<br>(0.58)  | -1.27*<br>(0.58)              | -1.34*<br>(0.58)  | -1.31*<br>(0.58)  | -1.31*<br>(0.58)  | -1.31*<br>(0.58)           | -1.32*<br>(0.58)  | -1.32*<br>(0.58)  | -1.32*<br>(0.58)  |  |
| War8                         | -2.29**<br>(0.57)       | -2.34**<br>(0.57) | -2.29**<br>(0.57) | -2.28**<br>(0.57) | -2.28**<br>(0.57) | -2.26**<br>(0.57) | -2.22**<br>(0.57)             | -2.28**<br>(0.57) | -2.26**<br>(0.57) | -2.27**<br>(0.57) | -2.29**<br>(0.57)          | -2.28**<br>(0.57) | -2.27**<br>(0.57) | -2.28**<br>(0.57) |  |

Table 5.2—Continued

|                             | U.S. Military Personnel |                   |                   |                   |                   | Treaties          |                               |                   |                   |                   |                            |                   |                   |                   |
|-----------------------------|-------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------------------|-------------------|-------------------|-------------------|----------------------------|-------------------|-------------------|-------------------|
|                             | All                     | Air Force         | Navy              | Marine Corps      | Army              | All               | Noneconomic Security Treaties |                   |                   |                   | Economic Security Treaties |                   |                   |                   |
|                             |                         |                   |                   |                   |                   |                   | Total                         | Access            | Admin             | Guarantees        | Operational                | Total             | Financial         | Material          |
| War9                        | -1.69**<br>(0.64)       | -1.72**<br>(0.64) | -1.70**<br>(0.64) | -1.68**<br>(0.64) | -1.69**<br>(0.64) | -1.67**<br>(0.64) | -1.64**<br>(0.64)             | -1.70**<br>(0.64) | -1.68**<br>(0.64) | -1.68**<br>(0.64) | -1.70**<br>(0.64)          | -1.68**<br>(0.64) | -1.68**<br>(0.64) | -1.68**<br>(0.64) |
| War10                       | 0.35<br>(0.35)          | 0.34<br>(0.35)    | 0.33<br>(0.34)    | 0.37<br>(0.35)    | 0.37<br>(0.35)    | 0.38<br>(0.35)    | 0.40<br>(0.35)                | 0.35<br>(0.35)    | 0.37<br>(0.35)    | 0.36<br>(0.35)    | 0.35<br>(0.35)             | 0.37<br>(0.35)    | 0.37<br>(0.34)    | 0.37<br>(0.35)    |
| Log product GDP             | 2.04**<br>(0.12)        | 2.03**<br>(0.12)  | 2.07**<br>(0.12)  | 1.92**<br>(0.12)  | 1.92**<br>(0.12)  | 1.88**<br>(0.12)  | 1.88**<br>(0.12)              | 1.95**<br>(0.12)  | 1.91**<br>(0.12)  | 1.92**<br>(0.12)  | 1.89**<br>(0.12)           | 1.90**<br>(0.12)  | 1.96**<br>(0.12)  | 1.90**<br>(0.12)  |
| Log product GDP per capita  | -0.26*<br>(0.12)        | -0.20<br>(0.11)   | -0.29*<br>(0.12)  | -0.12<br>(0.12)   | -0.12<br>(0.11)   | -0.09<br>(0.11)   | -0.11<br>(0.11)               | -0.14<br>(0.11)   | -0.13<br>(0.11)   | -0.13<br>(0.11)   | -0.08<br>(0.11)            | -0.10<br>(0.12)   | -0.18<br>(0.12)   | -0.10<br>(0.12)   |
| Current colony              | -2.83**<br>(0.97)       | -2.82**<br>(0.96) | -2.79**<br>(0.96) | -2.86**<br>(0.96) | -2.87**<br>(0.96) | -2.87**<br>(0.96) | -2.86**<br>(0.96)             | -2.86**<br>(0.96) | -2.87**<br>(0.96) | -2.86**<br>(0.96) | -2.81**<br>(0.95)          | -2.87**<br>(0.96) | -2.84**<br>(0.96) | -2.87**<br>(0.96) |
| Currency union              | 0.58<br>(0.40)          | 0.65<br>(0.40)    | 0.60<br>(0.40)    | 0.66<br>(0.40)    | 0.66<br>(0.40)    | 0.67<br>(0.40)    | 0.66<br>(0.40)                | 0.64<br>(0.40)    | 0.65<br>(0.40)    | 0.66<br>(0.40)    | 0.65<br>(0.40)             | 0.66<br>(0.40)    | 0.64<br>(0.40)    | 0.66<br>(0.40)    |
| Year fixed effects?         | Yes                     | Yes               | Yes               | Yes               | Yes               | Yes               | Yes                           | Yes               | Yes               | Yes               | Yes                        | Yes               | Yes               | Yes               |
| Country-dyad fixed effects? | Yes                     | Yes               | Yes               | Yes               | Yes               | Yes               | Yes                           | Yes               | Yes               | Yes               | Yes                        | Yes               | Yes               | Yes               |
| <i>T</i>                    | 43                      | 43                | 43                | 43                | 43                | 43                | 43                            | 43                | 43                | 43                | 43                         | 43                | 43                | 43                |
| No. of dyads                | 10,933                  | 10,933            | 10,933            | 10,933            | 10,933            | 10,933            | 10,933                        | 10,933            | 10,933            | 10,933            | 10,933                     | 10,933            | 10,933            | 10,933            |
| <i>N</i>                    | 318,731                 | 318,731           | 318,731           | 318,731           | 318,731           | 318,731           | 318,731                       | 318,731           | 318,731           | 318,731           | 318,731                    | 318,731           | 318,731           | 318,731           |

\* = 5-percent significance; \*\* = 1-percent significance. Standard errors reflect clustering at the country-dyad level.



## Global Stability

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The engagement and retrenchment schools offer sharply different predictions for the relationship between U.S. external security commitments and global stability. The hegemonic public goods theory predicts that these commitments should drive down the number and intensity of conflicts. Conversely, the retrenchment school argues that they should increase the number and intensity of conflicts.

Our analysis of the relationship between U.S. security commitments and the incidence of instability, which relies on the well-established Major Episodes of Political Violence database, provides no significant evidence of a stabilizing or destabilizing effect of these security commitments.<sup>1</sup> Of our 56 empirical specifications, exploring the likelihood and intensity of civil conflict, we find one specification suggesting that security commitments decrease the intensity of conflict. Given that a certain number of significant results are expected by chance alone, particularly at the 5-percent level as these two results are, we conclude that there is not a meaningful relationship between civil conflict and security commitments. This analysis therefore provides support for neither the engagement nor the retrenchment school.

### Methodology

Our approach for assessing the effect of U.S. external security commitments on stability follows the cross-country regression approach first introduced by Collier and Hoeffler to study civil conflict.<sup>2</sup> Cross-country regression models have been used to study how a variety of economic, political, geographic, and social factors influence the onset or incidence of conflict.

For our analysis, we use a country-level panel data set of civil conflict to explore the importance of U.S. security commitments. For comparability with the existing literature, we use a simplified version of the empirical specification used in Table 3 of Collier and Hoeffler that models the timing of the onset of civil war using cross-country regressions.<sup>3</sup> Specifically, we estimate

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<sup>1</sup> We also explored the potential relationship between security commitments and participation in international conflicts, but these data were judged to be too limited to provide reliable results.

<sup>2</sup> Collier and Hoeffler, 1998, 2004. The empirical analysis of civil conflict is dominated by similar cross-country regression approaches (Blattman and Miguel, 2010).

<sup>3</sup> Collier and Hoeffler, 2004. This approach differs from other cross-country approaches that model either the severity or duration of civil conflicts using the civil conflicts themselves as the unit of analysis (e.g., Lacina, 2006).

$$Conflict_{it} = \alpha \ln(S_{i,t-5} + 1) + \gamma_1 \ln\left(\frac{Y_{it}}{P_{it}}\right) + \gamma_2 \ln\left(\frac{Y_{it}}{P_{it}} - \frac{Y_{i,t-4}}{P_{i,t-4}}\right) + \delta_i + \eta_t + \varepsilon_{it},$$

where  $i$  denotes countries and  $t$  denotes year.<sup>4</sup> The dependent variable in this analysis, *Conflict*, is one of two measures of conflict—incidence of civil war and severity of civil war. In the analysis of civil war, we follow Collier and Hoeffler in coding ongoing conflicts as missing observations.<sup>5</sup> The explanatory variables include our measure of security commitments [ $\ln(S_{i,t-5} + 1)$ ] and two measures of economic performance:

- log GDP per capita  $\left[ \ln\left(\frac{Y_{it}}{P_{it}}\right) \right]$
- growth in GDP per capita  $\left[ \ln\left(\frac{Y_{it}}{P_{it}} - \frac{Y_{i,t-4}}{P_{i,t-4}}\right) \right]$ .<sup>6</sup>

Our analysis also includes country fixed effects ( $\delta_i$ ) and year fixed effects ( $\eta_t$ ); reported standard errors reflect clustering at the country level.

Our approach differs in two ways from Collier and Hoeffler.<sup>7</sup> First, our regressions exclude all explanatory variables other than the two economic measures that exhibit the most robust relationship with instability throughout the existing cross-country literature. Second, in addition to studying how external security commitments affect the onset of conflict, which is the focus of Collier and Hoeffler's work, we also explore how such commitments influence the intensity of these incidents of conflict.

The conflict variable is from the Major Episodes of Political Violence database. This database includes data on episodes of political violence in which “systematic and sustained use of lethal violence by organized groups [resulted] in at least 500 directly-related deaths.”<sup>8</sup> Each episode is scored on a ten-point scale, where a 10 corresponds to episodes of “extermination and annihilation” (e.g., the Holocaust) and a 1 corresponds to episodes of “sporadic or expressive political violence” (e.g., unrest in the United States from 1965 to 1968). The measure from the Major Episodes of Political Violence database included in our analysis, *CIVTOT*, is the sum of the magnitude of all episodes of civil political violence for each country-year observation. Civil political violence is defined to include civil violence, civil warfare, ethnic violence, and ethnic warfare. The aggregated level of civil conflict over time in each of our eight regions of analysis is reported in Figure 6.1.

<sup>4</sup> Note that our approach differs from Collier and Hoeffler (2004) in that we do not break the data into five-year blocks—that is, their dependent variable equals one if civil conflict started during a five-year period.

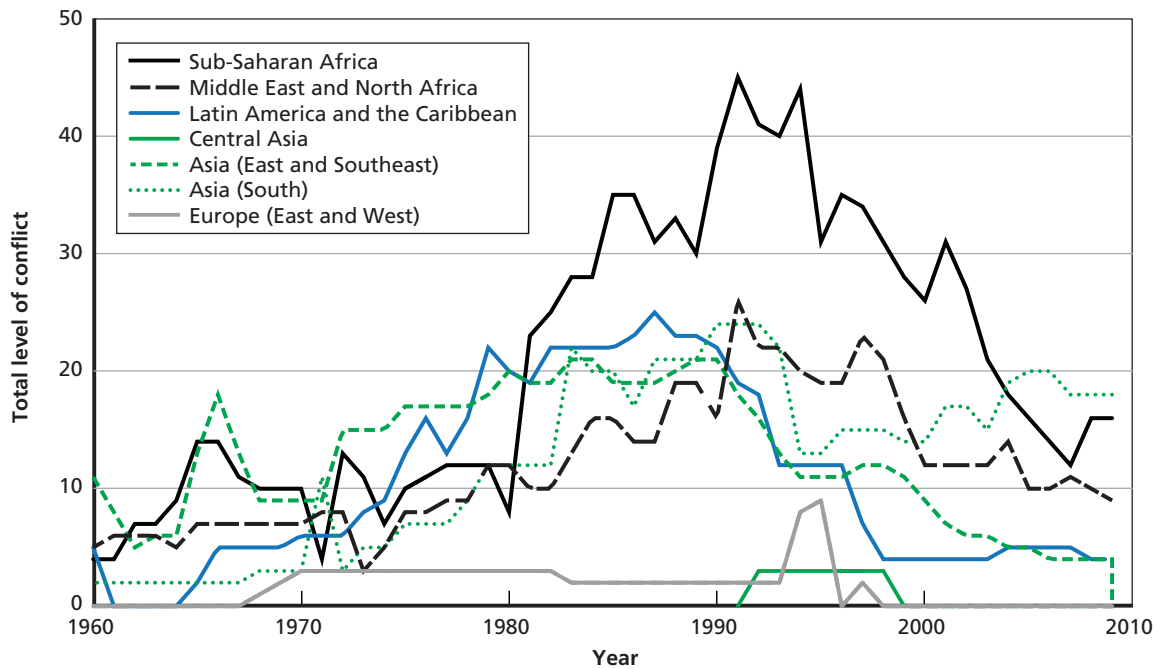
<sup>5</sup> Collier and Hoeffler, 2004.

<sup>6</sup> We follow Collier and Hoeffler in using the five-year average of per-capita growth (Collier and Hoeffler, 2004).

<sup>7</sup> Collier and Hoeffler, 2004.

<sup>8</sup> Monty G. Marshall, “Major Episodes of Political Violence (MEPV) and Conflict Regions, 1946–2012,” Center for Systemic Peace, April 30, 2013.

**Figure 6.1**  
Prevalence of Civil Conflict



RAND RR518-6.1

## Results

We do not find systematic evidence that country-specific U.S. external security commitments influence civil conflict. Our empirical results are in Table 6.1, which reports the relationship between country-specific U.S. external security commitments and the likelihood (first set of rows) and intensity (second set of rows) of civil conflict.

We find a similar result for the analysis of U.S. regional commitments in Table 6.2. While our analysis suggests that the regional posture of the U.S. Marine Corps is associated with reduced intensity of civil conflict—with a result that is significant at the 5-percent level—we find no evidence of a relationship with the likelihood of conflict. The evidence for treaties is similarly limited.

**Table 6.1**  
**Civil Conflict and Country-Specific Security Commitments**

|  |                  | U.S. Military Personnel |                |                |                |                 | Treaties                      |                 |                 |                |                            |                |                 |                 |                |       |
|--|------------------|-------------------------|----------------|----------------|----------------|-----------------|-------------------------------|-----------------|-----------------|----------------|----------------------------|----------------|-----------------|-----------------|----------------|-------|
|  |                  | All                     | Air Force      | Navy           | Marine Corps   | Army            | Noneconomic Security Treaties |                 |                 |                | Economic Security Treaties |                |                 |                 |                |       |
|  |                  |                         |                |                |                |                 | All                           | Total           | Access          | Admin          | Guarantees                 | Operational    | Total           | Financial       | Material       |       |
| Onset of conflict <sup>a</sup><br>(0 or 1) | No. of personnel | 0.05<br>(0.12)          | 0.10<br>(0.13) | 0.06<br>(0.15) | 0.17<br>(0.11) | -0.03<br>(0.16) |                               |                 |                 |                |                            |                |                 |                 |                |       |
|  | No. of treaties  |                         |                |                |                |                 | -0.19<br>(0.35)               | -0.03<br>(0.34) | -1.21<br>(1.35) | 0.26<br>(0.39) | -0.52<br>(0.56)            | 0.25<br>(0.59) | -0.03<br>(0.41) | -0.03<br>(0.68) | 0.24<br>(0.40) |       |
|  | <i>T</i>         | 49                      | 49             | 49             | 49             | 49              | 49                            | 49              | 49              | 49             | 49                         | 49             | 49              | 49              | 49             | 49    |
|  | No. of countries | 75                      | 75             | 75             | 75             | 75              | 75                            | 75              | 75              | 75             | 75                         | 75             | 75              | 75              | 75             | 75    |
|  | <i>N</i>         | 2,523                   | 2,523          | 2,523          | 2,523          | 2,523           | 2,523                         | 2,523           | 2,523           | 2,523          | 2,523                      | 2,523          | 2,523           | 2,523           | 2,523          | 2,523 |
| Conflict intensity <sup>b</sup><br>(1–10)  | No. of personnel | 0.01<br>(0.04)          | 0.04<br>(0.04) | 0.03<br>(0.05) | 0.03<br>(0.03) | -0.01<br>(0.03) |                               |                 |                 |                |                            |                |                 |                 |                |       |
|  | No. of treaties  |                         |                |                |                |                 | 0.01<br>(0.10)                | 0.12<br>(0.10)  | 0.08<br>(0.24)  | 0.08<br>(0.09) | 0.10<br>(0.12)             | 0.33<br>(0.20) | 0.03<br>(0.12)  | 0.01<br>(0.18)  | 0.11<br>(0.13) |       |
|  | <i>T</i>         | 49                      | 49             | 49             | 49             | 49              | 49                            | 49              | 49              | 49             | 49                         | 49             | 49              | 49              | 49             | 49    |
|  | No. of countries | 154                     | 154            | 154            | 154            | 154             | 154                           | 154             | 154             | 154            | 154                        | 154            | 154             | 154             | 154            | 154   |
|  | <i>N</i>         | 5,139                   | 5,139          | 5,139          | 5,139          | 5,139           | 5,139                         | 5,139           | 5,139           | 5,139          | 5,139                      | 5,139          | 5,139           | 5,139           | 5,139          | 5,139 |

NOTE: All regressions include (1) GDP growth and log(GDP per capita), (2) country fixed effects, and (3) year fixed effects.

<sup>a</sup> Analysis of presence of conflict follows Collier and Hoeffler (2004), uses a logit, and removes all ongoing conflicts from the analysis.

<sup>b</sup> Analysis of intensity of conflict uses a standard ordinary least squares regression framework and does not remove any observations.



**Table 6.2**  
**Civil Conflict and Regional Security Commitment Aggregates**

|  |                  | U.S. Military Personnel |                 |                 |                  |                 | Treaties                      |                |                |                 |                 |                            |                 |                 |                 |
|--|------------------|-------------------------|-----------------|-----------------|------------------|-----------------|-------------------------------|----------------|----------------|-----------------|-----------------|----------------------------|-----------------|-----------------|-----------------|
|  |                  | All                     | Air Force       | Navy            | Marine Corps     | Army            | Noneconomic Security Treaties |                |                |                 |                 | Economic Security Treaties |                 |                 |                 |
|  |                  |                         |                 |                 |                  |                 | All                           | Total          | Access         | Admin           | Guarantees      | Operational                | Total           | Financial       | Materiel        |
| Onset of conflict <sup>a</sup><br>(0 or 1) | No. of personnel | -0.30<br>(0.22)         | -0.47<br>(0.24) | -0.11<br>(0.23) | -0.01<br>(0.11)  | -0.19<br>(0.18) |                               |                |                |                 |                 |                            |                 |                 |                 |
|  | No. of treaties  |                         |                 |                 |                  |                 | -0.12<br>(0.45)               | 0.06<br>(0.40) | 0.68<br>(0.56) | 0.13<br>(0.40)  | -0.11<br>(0.38) | -0.33<br>(0.37)            | -0.34<br>(0.55) | -0.69<br>(0.82) | -0.18<br>(0.47) |
|  | <i>T</i>         | 49                      | 49              | 49              | 49               | 49              | 49                            | 49             | 49             | 49              | 49              | 49                         | 49              | 49              | 49              |
|  | No. of countries | 75                      | 75              | 75              | 75               | 75              | 75                            | 75             | 75             | 75              | 75              | 75                         | 75              | 75              | 75              |
|  | <i>N</i>         | 2,523                   | 2,523           | 2,523           | 2,523            | 2,523           | 2,523                         | 2,523          | 2,523          | 2,523           | 2,523           | 2,523                      | 2,523           | 2,523           | 2,523           |
| Conflict intensity <sup>b</sup><br>(1–10)  | No. of personnel | -0.13<br>(0.08)         | -0.22<br>(0.12) | -0.13<br>(0.08) | -0.08*<br>(0.03) | -0.06<br>(0.06) |                               |                |                |                 |                 |                            |                 |                 |                 |
|  | No. of treaties  |                         |                 |                 |                  |                 | -0.02<br>(0.10)               | 0.02<br>(0.11) | 0.27<br>(0.20) | -0.01<br>(0.11) | -0.03<br>(0.14) | 0.02<br>(0.09)             | -0.05<br>(0.10) | -0.17<br>(0.21) | -0.04<br>(0.10) |
|  | <i>T</i>         | 49                      | 49              | 49              | 49               | 49              | 49                            | 49             | 49             | 49              | 49              | 49                         | 49              | 49              | 49              |
|  | No. of countries | 154                     | 154             | 154             | 154              | 154             | 154                           | 154            | 154            | 154             | 154             | 154                        | 154             | 154             | 154             |
|  | <i>N</i>         | 5,139                   | 5,139           | 5,139           | 5,139            | 5,139           | 5,139                         | 5,139          | 5,139          | 5,139           | 5,139           | 5,139                      | 5,139           | 5,139           | 5,139           |

NOTE: All regressions include (1) GDP growth and log(GDP per capita), (2) country fixed effects, and (3) year fixed effects.

\* = 5-percent significance. Standard errors reflect clustering at the country level; regional-level clustering of standard errors gives analogous results.

<sup>a</sup> Analysis of presence of conflict follows Collier and Hoeffler (2004), uses a logit, and removes all ongoing conflicts from the analysis.

<sup>b</sup> Analysis of intensity of conflict uses a standard ordinary least squares regression framework and does not remove any observations.



## Trade Costs

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A final prediction of the engagement school is that commitments should reduce trade costs between nations. This prediction is part of the hegemonic public goods theory, which contends that these security commitments will reduce the likelihood that commerce is intercepted or destroyed by belligerents. It is related to the concept of stability, explored in the previous section, in that trade costs faced by traders from different countries should be lower in more-stable environments.

We test the potential relationship between security commitments and trade costs by using a historical database of trade costs for U.S. bilateral trade. These data, which were constructed by Hummels based on U.S. imports of merchandise data,<sup>1</sup> provide expenditures for “freight and insurance charges” for all U.S. bilateral trade from 1975 to 2004. Hummels combines these data with other commodity-specific trade costs—fuel costs, weight-to-value ratios, and other factors—to model how technology and the composition of trade influence trade costs.<sup>2</sup>

The analysis presented in this section augments the approach used by Hummels with our measures of security commitments.<sup>3</sup> Following his analytical specifications, we explore the relationship of security commitments to the components of “freight and insurance charges” not explained by economic factors.

Our analysis explores the relationship between security commitments and air and water trade costs separately, analogous to Hummels.<sup>4</sup> The analysis of air and water trade costs offers notably different perspectives on the potential effect of U.S. security commitments. Most importantly, low weight-to-value goods are shipped by air so that the analysis of air and water trade costs assesses two different sectors of international trade.<sup>5</sup>

In our analysis of air trade costs, we find strikingly curious evidence both in support of and in opposition to the predictions of the hegemonic public goods theory. On the one hand, we find that the regional security posture of the United States, in terms of total numbers of personnel and treaties, significantly reduces both air and water shipping trade costs. Although we are unable to demonstrate that the relationship between reduced trade costs and the U.S. regional security posture is necessarily driven by the stabilizing role of the United States in the

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<sup>1</sup> Hummels, 2007.

<sup>2</sup> Hummels, 2007.

<sup>3</sup> Hummels, 2007.

<sup>4</sup> Hummels, 2007.

<sup>5</sup> Between 1975 and 2004, air trade grew from 8 percent to 32 percent of U.S. imports and from 12 percent to 53 percent of U.S. exports. Percentages are a share of trade value and exclude North American trade (Hummels, 2007).

region, because the U.S. presence could be associated with improved transit facilities, these results are consistent with the engagement school's predictions.

On the other hand, our analysis of the potential effect of country-specific security commitments on trade costs provides a different and more complicated view. While the presence of U.S. forces at the country level seems to reduce air trade costs, treaty arrangements at the country level are associated with *increased* air trade costs. Moreover, almost all types of commitments at the country level are associated with *increased* water trade costs.

## Methodology

We examine the relationship between air and ocean shipping costs and U.S. external security commitments, building on the work of Hummels.<sup>6</sup> We augment his statistical model by including measures of GDP and GDP per capita, as well as our various measures of U.S. external security commitments.

Our analysis estimates the relationship between security commitments and trade costs as

$$\ln(\text{Cost}_{jkt}) = \alpha \ln(S_{i,t-5} + 1) + \gamma_1 \frac{W_{jkt}}{P_{jkt}} + \gamma_2 F_t + \gamma_3 \ln(T_{it}) + \gamma_4 \log(Y_{it}) + \gamma_5 \ln\left(\frac{Y_{it}}{P_{it}}\right) + \delta_{jk} + t + \varepsilon_{it},$$

where  $j$  denotes the exporting country,  $k$  is the commodity being exported, and  $t$  denotes the year.<sup>7</sup> The dependent variable,  $\text{Cost}_{jkt}$ , is the *ad valorem cost*—the cost of moving the good as a proportion of the cost of the good—of importing good  $k$  from country  $j$  in year  $t$ . The explanatory variables are identical to those described in the previous sections with three exceptions:

- $\frac{W_{jkt}}{P_{jkt}}$  is the weight-to-value of the commodity being shipped
- $F_t$  are fuel costs for that year
- $t$  is a time trend.<sup>8</sup>

Analysis is done separately for air and water trade costs, and reported standard errors reflect clustering at the goods  $\times$  country level.

<sup>6</sup> Hummels, 2007. Hummels used these data to explore how technology, composition of trade, and cost shocks affect air and ocean shipping transportation costs. Cost shocks can be considered events external to supply and demand for shipping within the trade system that cause changes in costs.

<sup>7</sup> Our analysis reports results for trade in goods grouped at the one-digit level of the standard international trade classification (SITC), a highly aggregated level. This is a limitation, as costs could differ greatly for specific goods within a one-digit category. However, this limitation is a computational limit based on the analytic approach used for the counterfactual methodology. We are examining approaches for extending the analysis to two- and three-digit SITC levels.

<sup>8</sup> Both the weight per value of the commodity and the fuel costs differ for the air and ocean shipments.

## Results

The analysis of the relationship between security commitments and trade costs is again sequenced into separate analyses of country-specific and then overall regional commitments, presented sequentially in Tables 7.1 and 7.2. However, we follow Hummels in analyzing the potential relationship with air and water trade costs separately.<sup>9</sup> Thus, the top of each of these two tables considers costs associated with trade by water, while the bottom presents costs associated with trade by air.

The analysis of country-specific commitments is presented in Table 7.1. Here, we find significant evidence that security commitments affect trade costs. While we find mixed results for the relationship between U.S. personnel and trade costs, we find a strongly significant and consistent positive relationship between the number of treaties and both air and water trade costs. Thus, an increased number of treaties is associated with increased trade costs of both kinds. Although these results are based on country-specific commitments, and thus do not capture the “hegemon effect,” they do not support the public goods theory.

However, our analysis of the regional U.S. security posture on trade costs, presented in Table 7.2, provides significant support for the engagement school’s predictions. Specifically, we find that both an increased number of various types of U.S. military personnel and an increased number of various types of treaties are associated with reduced air and water trade costs. Although our data do not allow us to explore how these regional commitments are reducing trade, particularly given the largely opposite role we see for country-specific commitments, these results are consistent with the engagement school’s predictions.

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<sup>9</sup> Hummels, 2007.

**Table 7.1**  
**Effect of Country-Specific Security Commitments on Trade Costs**

|       |                   | U.S. Military Personnel |                 |                  |                  |                  | Treaties         |                               |                   |                  |                  |                            |                  |                  |                  |         |
|-------|-------------------|-------------------------|-----------------|------------------|------------------|------------------|------------------|-------------------------------|-------------------|------------------|------------------|----------------------------|------------------|------------------|------------------|---------|
|       |                   | All                     | Air Force       | Navy             | Marine Corps     | Army             | All              | Noneconomic Security Treaties |                   |                  |                  | Economic Security Treaties |                  |                  |                  |         |
|       |                   |                         |                 |                  |                  |                  |                  | Total                         | Access            | Admin            | Guarantees       | Operational                | Total            | Financial        | Material         |         |
| Water | No. of personnel  | 0.03<br>(0.02)          | 0.00<br>(0.02)  | 0.07**<br>(0.02) | -0.02<br>(0.01)  | 0.04*<br>(0.02)  |                  |                               |                   |                  |                  |                            |                  |                  |                  |         |
|       | No. of treaties   |                         |                 |                  |                  |                  | 0.18**<br>(0.03) | 0.24**<br>(0.03)              | 0.61**<br>(0.07)  | 0.37**<br>(0.05) | -0.06<br>(0.03)  | 0.27**<br>(0.04)           | 0.14**<br>(0.03) | 0.26**<br>(0.05) | 0.13**<br>(0.03) |         |
|       | Goods × countries | 72,804                  | 72,804          | 72,804           | 72,804           | 72,804           | 72,804           | 72,804                        | 72,804            | 72,804           | 72,804           | 72,804                     | 72,804           | 72,804           | 72,804           | 72,804  |
|       | No. of countries  | 111                     | 111             | 111              | 111              | 111              | 111              | 111                           | 111               | 111              | 111              | 111                        | 111              | 111              | 111              | 111     |
|       | N                 | 649,042                 | 649,042         | 649,042          | 649,042          | 649,042          | 649,042          | 649,042                       | 649,042           | 649,042          | 649,042          | 649,042                    | 649,042          | 649,042          | 649,042          | 649,042 |
| Air   | No. of personnel  | -0.05*<br>(0.02)        | -0.04<br>(0.02) | -0.04<br>(0.02)  | 0.04**<br>(0.01) | -0.05*<br>(0.02) |                  |                               |                   |                  |                  |                            |                  |                  |                  |         |
|       | No. of treaties   |                         |                 |                  |                  |                  | 0.19**<br>(0.03) | 0.16**<br>(0.03)              | -0.68**<br>(0.08) | 0.28**<br>(0.05) | 0.22**<br>(0.04) | 0.19**<br>(0.04)           | 0.22**<br>(0.03) | 0.41**<br>(0.05) | 0.21**<br>(0.03) |         |
|       | Goods × countries | 77,574                  | 77,574          | 77,574           | 77,574           | 77,574           | 77,574           | 77,574                        | 77,574            | 77,574           | 77,574           | 77,574                     | 77,574           | 77,574           | 77,574           | 77,574  |
|       | No. of countries  | 157                     | 157             | 157              | 157              | 157              | 157              | 157                           | 157               | 157              | 157              | 157                        | 157              | 157              | 157              | 157     |
|       | N                 | 639,235                 | 639,235         | 639,235          | 639,235          | 639,235          | 639,235          | 639,235                       | 639,235           | 639,235          | 639,235          | 639,235                    | 639,235          | 639,235          | 639,235          | 639,235 |

NOTE: All regressions follow the specifications used by Hummels, 2007, in Column 4 of Table 2. The analysis of air and water trade costs, therefore, includes weight divided by the value of each commodity, fuel costs, distance, time trend, and distance × time trend. The analysis of water trade costs also includes the containerized share of trade. Both types of analyses include country × commodity (SITC five-digit) fixed effects. We augment this approach with our measures of security commitments and log(GDP) and log(GDP per capita) of each trading country. Each type of good in each year in each country gets a separate observation.

\* = 5-percent significance; \*\* = 1-percent significance. Standard errors reflect clustering at the goods × country level. None of the point estimates in this table is significant if clustering is instead conducted at the country level.

**Table 7.2**  
**Effect of Regional Aggregated Security Commitments on Trade Costs**

|       |                   | U.S. Military Personnel |                   |                   |                   |                   | Treaties         |                               |                   |                   |                   |                            |                  |                   |                  |
|-------|-------------------|-------------------------|-------------------|-------------------|-------------------|-------------------|------------------|-------------------------------|-------------------|-------------------|-------------------|----------------------------|------------------|-------------------|------------------|
|       |                   | All                     | Air Force         | Navy              | Marine Corps      | Army              | All              | Noneconomic Security Treaties |                   |                   |                   | Economic Security Treaties |                  |                   |                  |
|       |                   |                         |                   |                   |                   |                   |                  | Total                         | Access            | Admin             | Guarantees        | Operational                | Total            | Financial         | Material         |
| Water | No. of personnel  | -0.26**<br>(0.02)       | -0.11**<br>(0.03) | -0.19**<br>(0.04) | -0.24**<br>(0.02) | -0.19**<br>(0.01) |                  |                               |                   |                   |                   |                            |                  |                   |                  |
|       | No. of treaties   |                         |                   |                   |                   |                   | -0.10<br>(0.06)  | -0.02<br>(0.06)               | -0.28**<br>(0.09) | 0.29**<br>(0.06)  | -0.21**<br>(0.04) | -0.08<br>(0.06)            | -0.11*<br>(0.05) | -0.51**<br>(0.10) | -0.08<br>(0.05)  |
|       | Goods × countries | 72,804                  | 72,804            | 72,804            | 72,804            | 72,804            | 72,804           | 72,804                        | 72,804            | 72,804            | 72,804            | 72,804                     | 72,804           | 72,804            | 72,804           |
|       | No. of countries  | 111                     | 111               | 111               | 111               | 111               | 111              | 111                           | 111               | 111               | 111               | 111                        | 111              | 111               | 111              |
|       | N                 | 649,042                 | 649,042           | 649,042           | 649,042           | 649,042           | 649,042          | 649,042                       | 649,042           | 649,042           | 649,042           | 649,042                    | 649,042          | 649,042           | 649,042          |
| Air   | No. of personnel  | -0.02<br>(0.02)         | -0.06*<br>(0.03)  | -0.01<br>(0.04)   | -0.27**<br>(0.03) | -0.00<br>(0.01)   |                  |                               |                   |                   |                   |                            |                  |                   |                  |
|       | No. of treaties   |                         |                   |                   |                   |                   | -0.18*<br>(0.08) | -0.22**<br>(0.07)             | 0.05<br>(0.10)    | -0.40**<br>(0.07) | 0.31**<br>(0.05)  | -0.15*<br>(0.07)           | -0.03<br>(0.06)  | 0.46**<br>(0.10)  | -0.12*<br>(0.06) |
|       | Goods × countries | 77,574                  | 77,574            | 77,574            | 77,574            | 77,574            | 77,574           | 77,574                        | 77,574            | 77,574            | 77,574            | 77,574                     | 77,574           | 77,574            | 77,574           |
|       | No. of countries  | 157                     | 157               | 157               | 157               | 157               | 157              | 157                           | 157               | 157               | 157               | 157                        | 157              | 157               | 157              |
|       | N                 | 639,235                 | 639,235           | 639,235           | 639,235           | 639,235           | 639,235          | 639,235                       | 639,235           | 639,235           | 639,235           | 639,235                    | 639,235          | 639,235           | 639,235          |

NOTE: All regressions follow the specifications used by Hummels, 2007, in Column 4 of Table 2. The analysis of air and water trade costs, therefore, includes weight divided by the value of each commodity, fuel costs, distance, time trend, and distance × time trend. The analysis of water trade costs also includes the containerized share of trade. Both types of analyses include country × commodity (SITC five-digit) fixed effects. We augment this approach with our measures of security commitments and log(GDP) and log(GDP per capita) of each trading country. Each type of good in each year in each country gets a separate observation.

\* = 5-percent significance; \*\* = 1-percent significance. Standard errors reflect clustering at the goods × country level. None of the point estimates in this table is significant if clustering is instead conducted at the country level.





## Estimated Effects of a 50-Percent Reduction in External Security Commitments

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The retrenchment school has called for a wholesale reduction in overseas security commitments (see Chapter One). This chapter explores the implications for the U.S. economy of this potential wholesale reduction in commitments. Rather than attempt to mimic one of the existing proposals, we consider the economic effects of a relatively straightforward 50-percent reduction in U.S. overseas security commitments. However, our empirical approach could also be used to measure the economic effects of specific proposals for retrenchment.<sup>1</sup>

We estimate the effect of a 50-percent reduction in commitments on U.S. bilateral trade using the approach developed by Glick and Taylor for estimating the trade effects of World Wars I and II.<sup>2</sup> This approach uses the point estimates from the gravity model of trade, which we estimated in Chapter Four, to model this reduction. Our approach differs from Glick and Taylor in that (1) we focus on U.S. bilateral trade, and not global trade, and (2) our explanatory variable is a continuous variable (e.g., the log-level of security commitments) rather than a binary variable (e.g., onset of war). However, the intuition of the analysis is the same: Glick and Taylor focused on comparing countries before and during the war, while we compare trade levels in the current period with what they looked like in previous periods when the trade commitments were more, or less, robust.

We conservatively estimate that U.S. bilateral trade in goods could fall by some \$450 billion per year, in 2015 dollars, if security commitments were reduced by 50 percent. This estimate, which excludes any potential impact on trade with Canada and Mexico, is equivalent to an approximate 18-percent reduction in U.S. trade in goods with countries outside of North America, as the total amount of trade in goods with these countries exceeded \$2.5 trillion in 2015. If we extrapolate these estimates to include trade in both goods and services—relying on secondary data from the U.S. Bureau of Economic Analysis, which suggests that trade in goods accounts for approximately 78 percent of total U.S. bilateral trade (with the rest made up of trade in services)—then the impact of a 50-percent reduction in security commitments could reduce U.S. trade by as much as \$577 billion per year.<sup>3</sup>

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<sup>1</sup> We thank one of our reviewers, C. Richard Neu, for this suggestion. Although the intent of this chapter was to provide a reduced-form, “back of the envelope” estimate of retrenchment, an analogous approach could be used to explore more-granular retrenchment proposals. In practice, such an approach would require slightly different regression specifications (e.g., allowing point estimates to vary by region) but would be analogous to the approach that we employ here.

<sup>2</sup> Glick and Taylor, 2010.

<sup>3</sup> U.S. Department of Commerce, *U.S. International Trade in Goods and Services, September 2013*, U.S. Census Bureau and U.S. Department of Commerce, November 14, 2013, Exhibit 1, data for 2011. Specifically, we scale up our estimate of \$450 billion by 28.2 percent, because  $22/78 = 0.282$ .

These estimates are “partial equilibrium” estimates, in that they do not account for the fact that these reductions would also suppress global trade (demonstrated in Chapter Five) and free up resources for other potentially productive uses. Reductions in global trade would be expected to have negative effects on global GDP, which would consequently have indirect negative effects on U.S. bilateral trade, because trade and GDP are positively related. Conversely, there are likely to be benefits to the U.S. economy from freeing up resources from these overseas commitments for other productive uses. If this benefit is large, then our analysis may overstate the effects of reductions in U.S. security commitments.

Partially for this reason, we apply a very conservative trade multiplier of 0.85 to the total estimated loss of \$577 billion in goods and services as a result of a 50-percent retrenchment. This trade multiplier suggests that for every dollar in lost U.S. bilateral trade, only 85 cents would ultimately be deducted from U.S. GDP, because 15 percent of the initial investment in overseas commitments would have been invested in other productive uses. Therefore, our final analysis suggests that GDP could fall by as much as \$490 billion as a result of a 50-percent reduction in overseas security commitments.

## Counterfactual Methodology

Our counterfactual methodology follows the “partial equilibrium” approach that Glick and Taylor used for estimating trade losses from the two World Wars.<sup>4</sup> Following their approach, we extrapolate the results from our gravity model of U.S. bilateral trade (Chapter Four), which calculates the marginal value of security commitments, to our counterfactual 50-percent reduction in commitments.

The counterfactual estimates of a 50-percent reduction in security commitments are developed in two stages. First, because a 50-percent reduction in commitments will affect both the country-specific and regional aggregates of commitments, we estimate a slightly modified version of the regressions used in Chapter Four that combines the country-specific and regional analyses. Specifically, we estimate

$$\ln(T_{it}) = \alpha_1 \ln(S_{i,t-5} + 1) + \alpha_2 \ln\left[\left(\sum_{y \in R_i} S_{y,t-5}\right) + 1\right] + \gamma_1 \ln(Y_{it}) + \gamma_2 \ln\left(\frac{Y_{it}}{P_{it}}\right) + \delta_i + \eta_t + \varepsilon_{it},$$

where we are now interested in both  $\alpha_1$  (the relationship of country-specific security commitments to trade) and  $\alpha_2$  (the relationship of regional security commitments to trade). Everything else in this regression is the same as described in Chapter Four, including the use of country-level clustering in calculating standard errors.

Second, based on these regression results, we estimate the implication of a 50-percent reduction in U.S. external security commitments. Here, we are interested in the total trade value implications of this reduction. If we define  $T_i^{50\%}$  as the level of trade in country  $i$  given

<sup>4</sup> Glick and Taylor, 2010.

the 50-percent reduction in security commitments, then our estimate of the counterfactual for each country is

$$\text{Counterfactual}_i = T_i^{50\%} - T_i = T_i \left( \frac{T_i^{50\%}}{T_i} - 1 \right).$$

If we replace  $T_i^{50\%}$  and  $T_i$  with estimates from our regression approach specified above, this can be rewritten as

$$T_i \left( \frac{\widehat{T}_i^{50\%}}{\widehat{T}_i} - 1 \right) = T_i \left[ e^{\left\{ \widehat{\alpha}_1 \left[ \ln \left( \frac{S_{i,t-5}}{2} + 1 \right) - \ln(S_{i,t-5} + 1) \right] + \widehat{\alpha}_2 \left[ \ln \left[ \frac{\left( \sum_{y \in R_i} S_{y,t-5} \right)}{2} + 1 \right] - \ln \left[ \left( \sum_{y \in R_i} S_{y,t-5} \right) + 1 \right] \right\}} - 1 \right)}, \right.$$

which can be calculated directly using the two estimated parameters— $\widehat{\alpha}_1$  and  $\widehat{\alpha}_2$ —obtained from the above regression. These counterfactual estimates should be treated as illustrative and approximate rather than precise, as our regression results provide estimates of the marginal value of security commitments and not the aggregate value. However, and this is important for understanding the magnitude of the 50-percent reduction in our counterfactual estimates, our counterfactual of a 50-percent retrenchment is “within sample” for most of our independent variables, although the same cannot be said for an 80-percent retrenchment, particularly with respect to treaties.<sup>5</sup> The dollar-value estimates that we report are based on 2015 trade data and denominated in 2015 U.S. dollars. The baseline trade data for these estimates come from the U.S. Census Bureau, accounting for \$2.52 trillion of the \$3.74 trillion in total bilateral trade in goods in 2015, as our analysis excludes Canada, Mexico, and several small countries with insufficient economic data for analysis.<sup>6</sup> Canada and Mexico are excluded from the analysis because both countries fall within a regional grouping that includes the United States.

## Results

Our counterfactual estimates—that is, the economic effect of a 50-percent reduction in U.S. external security commitments—are reported in Table 8.1. This analysis is organized analogously to our previous analyses, as we consider the economic effects of a 50-percent reduction in each of the 14 different measures of security commitments sequentially.

<sup>5</sup> For the personnel variables, every country has experienced enough variation (either an increase or decrease) so that a 50-percent decrease is within sample, although only 70–80 percent of the countries (depending on the service) have enough variation to model an 80-percent decrease. For treaties, approximately 80 percent of countries have enough variation for the 50-percent retrenchment analysis, while only 10–30 percent (depending on the type of treaty) have enough variation for the 80-percent retrenchment analysis.

<sup>6</sup> U.S. Census Bureau, “U.S. Trade in Goods by Country,” spreadsheet, 2016. Total U.S. bilateral trade for 2015 was approximately \$3.74 trillion; the discrepancy of \$60 billion (1.6 percent of total trade) is attributed to a variety of small countries for which personnel or treaty data were not available.

**Table 8.1**  
**U.S. Bilateral Trade Effects of a 50-Percent Reduction in U.S. Security Commitments**

| Regression Results  | U.S. Military Personnel |                  |                |                 |                  | Treaties        |                               |                 |                  |                 |                  |                            |                 |                |
|---|-------------------------|------------------|----------------|-----------------|------------------|-----------------|-------------------------------|-----------------|------------------|-----------------|------------------|----------------------------|-----------------|----------------|
|   | All                     | Air Force        | Navy           | Marine Corps    | Army             | All             | Noneconomic Security Treaties |                 |                  |                 |                  | Economic Security Treaties |                 |                |
|   |                         |                  |                |                 |                  |                 | Total                         | Access          | Admin            | Guarantees      | Operational      | Total                      | Financial       | Material       |
| No. in country  | 0.11<br>(0.06)          | 0.17**<br>(0.06) | 0.05<br>(0.09) | -0.03<br>(0.06) | 0.17**<br>(0.06) | 0.53*<br>(0.24) | 0.37<br>(0.22)                | 0.09<br>(0.52)  | 0.68**<br>(0.23) | 0.06<br>(0.20)  | -0.27<br>(0.27)  | 0.50<br>(0.30)             | -0.25<br>(0.35) | 0.39<br>(0.28) |
| No. in region   | 0.08<br>(0.07)          | 0.09<br>(0.08)   | 0.08<br>(0.09) | 0.10<br>(0.06)  | -0.03<br>(0.06)  | 0.25<br>(0.19)  | 0.32<br>(0.20)                | -0.19<br>(0.25) | 0.11<br>(0.17)   | -0.09<br>(0.18) | 0.62**<br>(0.20) | 0.31<br>(0.19)             | 0.68*<br>(0.32) | 0.32<br>(0.17) |
| Year fixed effects?   | Yes                     | Yes              | Yes            | Yes             | Yes              | Yes             | Yes                           | Yes             | Yes              | Yes             | Yes              | Yes                        | Yes             | Yes            |
| Country fixed effects?  | Yes                     | Yes              | Yes            | Yes             | Yes              | Yes             | Yes                           | Yes             | Yes              | Yes             | Yes              | Yes                        | Yes             | Yes            |
| <i>T</i>  | 50                      | 50               | 50             | 50              | 50               | 50              | 50                            | 50              | 50               | 50              | 50               | 50                         | 50              | 50             |
| No. of countries  | 177                     | 177              | 177            | 177             | 177              | 177             | 177                           | 177             | 177              | 177             | 177              | 177                        | 177             | 177            |
| <i>N</i>  | 6,363                   | 6,363            | 6,363          | 6,363           | 6,363            | 6,363           | 6,363                         | 6,363           | 6,363            | 6,363           | 6,363            | 6,363                      | 6,363           | 6,363          |
| Estimated change in trade from 50% reduction (\$U.S. 2015 billions) | -218                    | -351**           | -105           | -97             | -148             | -427**          | -231                          | 407             | -42              | 129             | -221             | -500**                     | -521            | -403*          |

NOTE: All regressions include (1) log(GDP) and log(GDP per capita) of the trading country, (2) country fixed effects, and (3) year fixed effects.

\* = 5-percent significance; \*\* = 1-percent significance. Standard errors reflect clustering at the country level. Results are similar with regional-level clustering of standard errors.

However, the results presented in Table 8.1 differ in two ways from the analyses presented in Chapter Four. First, all our regression analyses now combine both the country-specific and regional effects of U.S. security commitments. Point estimates for both of these troop and treaty variables are reported corresponding to the rows for number in country and number in region. Second, at the bottom of each panel, in the yellow row, we report our counterfactual estimate in terms of the real dollar effect of the 50-percent reduction in security commitments on total U.S. bilateral trade (in 2015 dollars). The statistical significance of each counterfactual estimate is reported immediately alongside these dollar-value estimates.

The analysis in Table 8.1 finds statistically significant evidence that a 50-percent reduction in security commitments would have large negative impacts on U.S. trade. The evidence for treaties is the most robust and suggests that a 50-percent reduction in treaty relationships alone could reduce trade in goods by \$427 billion (with a reduction in economic security treaties alone reducing trade by exactly half a trillion dollars). There is also limited evidence that the reduction in personnel numbers—especially U.S. Air Force personnel—would lead to a statistically significant reduction of hundreds of billions of dollars in U.S. bilateral trade flows. But note that, in practice, the personnel effects cannot be separated from the treaty effects; therefore, the former cannot be simply added to the latter in our model, for there is considerable overlap between them.

The analogous analysis focusing on only the intensive effects of security commitments (not reported) provides qualitatively similar results. Specifically, although the magnitude of the point estimates falls in several cases, the estimated sign (positive or negative) of each of the security commitments is the same. Moreover, in the analysis of only the intensive effects, the number of personnel becomes statistically significant for four of the five personnel measures; the only personnel variable that is not significant is for the number of marines. The point estimate on the effect of airmen falls to a roughly \$220 billion reduction in trade, the point estimate for soldiers remains the same (though now statistically significant), and the estimate for the overall number of personnel is that a 50-percent reduction in their numbers would lower U.S. trade by \$200 billion. In contrast, the analysis of only the intensive effects finds no statistically significant impacts associated with increased numbers of treaty commitments.

We provide a final counterfactual estimate in Table 8.2, where we consider the *combined* effects of a 50-percent reduction in personnel *and* treaties. Here, we estimate that a 50-percent reduction in all security commitments would reduce annual U.S. bilateral trade by \$450 billion (in 2015 dollars). An analogous counterfactual analysis focusing on only the potential intensive effects of security commitments leads to the conclusion that a 50-percent reduction would reduce trade by just more than \$250 billion (results not reported). In these latter estimates, focusing on only the intensive effects of security commitments, the effect of a reduction in personnel drives the result (as compared with the analysis combining intensive and extensive effects, where treaties are marginally more important). Note again that these estimates do not include Canada and Mexico, because they fall within a regional grouping that includes the United States and are likely to be affected differently by any type of retrenchment.<sup>7</sup>

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<sup>7</sup> Canada and Mexico accounted for approximately 30 percent of U.S. bilateral trade in 2015 (U.S. Census, 2016).

**Table 8.2**  
**Economic Effect of 50-Percent Reduction in All U.S.**  
**Security Commitments**

| Regression Results  |                        | All Security Commitments |
|---|------------------------|--------------------------|
| Military personnel  | No. in country         | 0.05<br>(0.07)           |
|   | No. in region          | 0.06<br>(0.06)           |
| Treaties  | No. in country         | 0.34<br>(0.23)           |
|   | No. in region          | -0.10<br>(0.17)          |
|   | Year fixed effects?    | Yes                      |
|   | Country fixed effects? | Yes                      |
|   | <i>N</i>               | 6,363                    |
| Estimated loss of trade from 50% reduction (\$U.S. 2015 billions) |                        | -450**                   |

\*\* = 1-percent significance. Standard errors reflect clustering at the country level. Results are similar with regional-level clustering of standard errors.

### Implied Effect on U.S. Gross Domestic Product

We then take two final steps in our calculations of trade effects. First, we increase the value of the trade effect to include services trade. And second, we translate this trade effect into an effect on GDP.

Glick and Taylor limited their analysis to bilateral trade in goods,<sup>8</sup> and the data we use are only for goods trade. According to U.S. Bureau of Economic Analysis estimates, trade in goods accounts for approximately 78 percent of total U.S. bilateral trade, with the rest made up of trade in services.<sup>9</sup> Recent studies suggest that services trade responds to the gravity equation variables in a manner similar to goods trade and can be estimated effectively using the gravity model.<sup>10</sup> To extend the analysis to services trade and to estimate a total effect of a retrenchment of U.S. security commitments on U.S. bilateral trade, we assume that the effect of the security commitments on trade in services is comparable to that for goods. We thus take the trade results as reported in Table 8.2 and gross up the \$450 billion sum by the proportion of services trade in the total U.S. trade of goods and services,<sup>11</sup> yielding an estimate of lost U.S. trade in both goods and services of \$577 billion per year (excluding Canada and Mexico).

<sup>8</sup> Glick and Taylor, 2010.

<sup>9</sup> U.S. Department of Commerce, 2013, Exhibit 1, data for 2011.

<sup>10</sup> Fukunari Kimura and Hyun-Hoon Lee, "The Gravity Equation in International Trade in Services," *Review of World Economics*, Vol. 142, No. 1, April 2006; and Joseph Francois and Bernard Hoekman, "Services Trade and Policy," *Journal of Economic Literature*, Vol. 48, No. 3, September 2010.

<sup>11</sup> Specifically, we scale up our point estimate of \$450 billion by 28.2 percent, because  $22/78 = 0.282$ .

We then go one step further with the trade data. Based on findings in Frankel and Romer on the relationship between the growth of trade and the growth of GDP, we estimate how the decline of trade would likewise cause a decline in U.S. GDP.<sup>12</sup> Using different econometric specifications, Frankel and Romer derive two estimates of this multiplier effect of a change in the trade share of GDP on U.S. per-capita GDP itself: 0.85 and 1.97.<sup>13</sup>

In order to derive a conservative estimate of the impact of our modeled reduction in security commitments on overall U.S. GDP, we apply Frankel and Romer's most conservative estimate of the multiplier (0.85) to compute the decrease in per-capita GDP.<sup>14</sup> In the end, therefore, we estimate that the total annual trade loss of \$577 billion would be associated with a net reduction in U.S. annual GDP of 85 percent of that initial estimate, or \$490 billion per year (in 2015 dollars).<sup>15</sup>

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<sup>12</sup> Jeffrey A. Frankel and David Romer, "Does Trade Cause Growth?" *The American Economic Review*, Vol. 89, No. 3, June 1999. The findings in this article rely on analysis of all 150 countries with data available in the Penn World Tables.

<sup>13</sup> Frankel and Romer also conclude that "the relation between the geographic component of trade and income suggests that a rise of one percentage point in the ratio of trade to GDP increases income per person by at least one-half percent" (Frankel and Romer, 1999, p. 394).

<sup>14</sup> Frankel and Romer, 1999. Glick and Taylor conduct a similar exercise, but they start with 1.97 because that is the preferred estimate of Frankel and Romer (1999). However, Glick and Taylor (2010) also note that the Frankel and Romer coefficients provide linear relationships between per-capita GDP growth and change in trade share, so the coefficients can be changed easily for purposes of sensitivity testing.

<sup>15</sup> Glick and Taylor (2010, p. 119) report that the change in GDP associated with a change in trade can be calculated as  $\Delta GDP = \delta \Delta Trade$ , where  $\delta$  is the parameter estimate from Frankel and Romer.





## Conclusion

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The United States is in the midst of a great debate about how to maintain its national security and global preeminence in the face of enormous fiscal challenges.<sup>1</sup> Without changing tax or spending policies, the fiscal trends are clearly negative, and reducing U.S. security commitments is seen as one way of reducing the long-term federal budget deficit. But reducing security commitments may have other costs beyond the immediate budget savings, and so this decision calls for a full investigation of the costs and benefits of U.S. security commitments. Even with direct fiscal savings that may result, reducing these commitments may not have as much of an effect on the long-term budget balance as hoped. New analysis has assessed the cost of some of these commitments and found that they are relatively inexpensive.<sup>2</sup>

However, despite a growing literature questioning the value of U.S. security commitments,<sup>3</sup> there has been little rigorous evaluation to date of the value of these commitments. Part of the reason is theoretical: The analysis has been based on qualitative theories and analysis rather than solid data. And part of the reason is practical: Solid data have not existed.

We do not argue for the superiority of quantitative over qualitative analysis. Indeed, we recognize that our data are imperfect and may not completely measure the level or depth of U.S. security commitments. However, the overall question of the effect of security commitments on economic performance calls for quantitative analysis, and the use of quantitative data can provide new insights. Accordingly, we have created new, usable data to apply to the problem.

We find evidence that U.S. external security commitments do have positive effects on U.S. trade and GDP, and even on global trade, suggesting that the various streams of the engagement school constitute a good generalization of the effects of U.S. foreign security involvements. And though we do not find significant evidence that U.S. external security commitments can have a positive effect on reducing political violence, we present evidence that these security relationships can decrease trade costs.

We do not believe that this is the final word, and we expect that much more work will need to be done. Indeed, there are a number of weaknesses in our analysis. The main problems are endogeneity and the imprecise nature of our measures of U.S. security commitments. Addressing endogeneity will require developing new data sets that will allow for better identifi-

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<sup>1</sup> Nora Bensahel, David W. Barno (USA, Ret.), and Travis Sharp, *Hard Choices: Responsible Defense in an Age of Austerity*, Washington, D.C.: Center for a New American Security, October 7, 2011; and Nora Bensahel, David W. Barno (USA, Ret.), and Travis Sharp, *Sustainable Pre-Eminence: Reforming the U.S. Military at a Time of Strategic Change*, Washington, D.C.: Center for a New American Security, May 23, 2012.

<sup>2</sup> Mills et al., 2013; Lostumbo et al., 2013.

<sup>3</sup> Posen, 2014; Layne, 1997; and Robert A. Pape, "Empire Falls," *The National Interest*, January/February 2009.

cation strategies. One example is a data set of planned, but not implemented, changes to military presence and security agreements. Addressing the commitment measurement problems will require generating new data sets of force structures and assets, such as ships and aircraft, on a more-frequent basis than once a year. It may also require further development of our new security agreement data set to allow different types of agreements to be characterized in more detail. Therefore, future analysis is necessary and should strive to produce better measures.

Despite these limitations, the nature of the question calls for quantitative analysis. Although not determinative, such analysis is necessary, and that means that using the best data and methods available is key. This paper has done exactly that, and it should serve as a building block for both conducting future analysis and properly informing the current debate about the nature of U.S. security commitments.

Our results indicate that U.S. policymakers should carefully weigh the potential losses against the potential gains when considering large-scale retrenchments of U.S. overseas security commitments. The direct savings may be substantial, although there is a pretty wide variance in the estimates of these direct savings. Existing estimates suggest that retrenchment could bring annual GDP gains of \$139 billion, \$44 billion, or just \$9 billion, depending on the source.<sup>4</sup> There are likely to be indirect savings as well.<sup>5</sup> However, the annual indirect costs of up to \$490 billion that we find in this analysis are likely to be far larger than any savings. Policymakers who reduce these commitments would face not only the immediate problems of how and where to make the reductions but also the future problems of a poorer United States.

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<sup>4</sup> The three reported estimates are based respectively on Posen (2014), who reports that annual spending on defense could be reduced to 2.5 percent of GDP, which amounts to an estimated savings of \$126 billion that we increase to \$139 billion using conservative fiscal spending and tax multipliers; Friedman and Logan (2012, p. 187), who report that more than \$400 billion could be saved over ten years; and estimates from Lostumbo and colleagues (2013) and Mills and colleagues (2013), which indicate that a complete retrenchment of bases would bring annual savings of \$9 billion (assuming no reductions in overall personnel). Our calculation of the GDP savings from the reduction in government spending in each estimate follows the approach laid out by Barro and de Rugy (Robert Barro and Veronique de Rugy, *Defense Spending and the Economy*, Arlington, Va.: Mercatus Center, George Mason University, May 7, 2013) in that these numbers are adjusted by both spending multipliers (changes in GDP associated with changes in government spending) and tax multipliers (changes in GDP associated with changes in government taxation). Our estimated GDP savings reported in the main text rely on a relatively conservative assumption for the tax multiplier of  $-1.1$  (from Robert Barro and Charles Redlick, "Macroeconomic Effects from Government Purchases and Taxes," *Quarterly Journal of Economics*, Vol. 126, No. 1, 2011) and a very conservative assumption for the spending multiplier of zero. Barro and Redlick (2011) report estimates of  $0.4$ – $0.5$  for temporary defense spending and an additional  $0.1$ – $0.2$  higher for permanent spending, although Ramey concludes that multipliers for defense spending are in the  $0.6$ – $1.2$  range (Valerie A. Ramey, "Identifying Government Spending Shocks: It's All in the Timing," *Quarterly Journal of Economics*, 2011).

<sup>5</sup> As discussed earlier in this report, we are not aware of any existing analyses that explore the indirect benefit to the U.S. economy from the economic resources (labor, capital, and knowledge) that would be freed up as part of a reduction in external security commitments. However, we anticipate that this would be smaller than the large indirect costs of this retrenchment that we calculate in this study.

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Since the 1940s, U.S. international leadership has been justified, in part, by claims of a positive relationship between global stability and domestic prosperity. However, the economic returns from U.S. overseas security commitments have proved extraordinarily difficult to measure. Some policymakers and academics now support reducing or eliminating such commitments, especially in this era of mounting fiscal pressures.

RAND researchers use advanced econometric techniques and new data on U.S. overseas security commitments to explore whether and to what extent the United States derives economic benefits from these commitments. The analysis finds that the commitments have positive and statistically significant effects on both U.S. bilateral trade and non-U.S. global bilateral trade. The authors find mixed evidence of the effects on trade costs and no evidence of any effects on civil conflict, either for better or for worse.

The authors estimate that a 50-percent retrenchment in U.S. overseas security commitments could reduce U.S. bilateral trade in goods and services annually by as much as \$577 billion—or 18 percent—excluding trade with Canada and Mexico. Based on conservative assumptions, the resulting annual decline in U.S. gross domestic product (GDP) would be \$490 billion (in 2015 U.S. dollars). Others suggest that the GDP benefits of an 80-percent retrenchment could reach \$139 billion, but that is less than one-third of the estimated economic losses from just a 50-percent retrenchment. U.S. policymakers should carefully weigh the potential losses against the potential gains when considering large-scale retrenchments of U.S. overseas security commitments.



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