Budget Breaker?
The Financial Cost of U.S. Military Alliances

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Abstract

How do alliance commitments affect U.S. military spending? This question is at the heart of debates about the value of alliances and the future of U.S. grand strategy. One perspective, which we call the *budget hawk* view, asserts that alliances are exorbitantly expensive, as they require military investments to deter third-party adversaries and reassure allies, encourage free-riding, and facilitate reckless allied behavior. A competing view, which we label the *bargain hunter* perspective, claims that U.S. alliance commitments are relatively cheap and might even reduce military spending. Allies provide key military capabilities, reassurance and extended deterrence are cheaper than it might initially seem, and alliances reduce the need for costly military interventions by promoting peace. Despite the importance of this debate, few studies have attempted to determine how alliance commitments affect U.S. military spending. We use over-time variation in the number of U.S. alliance commitments to estimate their financial toll. A statistical model of U.S. defense expenditures from 1947 to 2019 shows that one new alliance commitment adds between $11 and $21 billion to the size of the defense budget. Military alliances benefit the United States in many ways but, consistent with the budget hawk view, they are expensive.

In his farewell address, which appeared in print on September 19, 1796, George Washington warned the United States not to form permanent alliances.[1] U.S. leaders heeded this advice for more than 150 years. After World War II, however, the United States entered into a flurry of formal defense pacts in which it agreed to protect other countries from attack. It formed multilateral arrangements such as the Inter-American Treaty of Reciprocal Assistance (Rio Pact), the North Atlantic Treaty Organization (NATO), the Southeast Asia Treaty Organization (SEATO), and the Australia, New Zealand, United States Security Treaty (ANZUS). In addition, in the early days of the Cold War, Washington gave bilateral security assurances to Iran, Japan, South Korea, Taiwan, and the Philippines. American defense commitments continue to expand. Most recently, on March 27, 2020, the United States put North Macedonia under its security umbrella. In total, nearly 70 countries have treaty-backed American protection today.

Many studies have analyzed the implications of U.S. military alliances for international peace and conflict.[2] This article investigates a consequence of security guarantees that has been relatively overlooked in scholarship on alliance politics: the financial cost of forming and maintaining defense commitments for the United States. How do alliance commitments alter the U.S. defense budget? The answer can provide a starting point for evaluating U.S. support for military alliances in the Biden Administration and beyond. Knowing the degree to which alliances benefit the United States depends on having a more systematic sense of their budgetary effects.[3]

We develop and test two competing theories on the budgetary implications of U.S. alliances.[4]

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1. The United States entered into one defense pact during its revolutionary period before Washington resumed his presidency: a 1778 alliance with France, which officially ended in 1800.

2. Much of this work includes, but is not limited to, U.S. alliance commitments. See, for example, Brett Ashley Leeds, "Do Alliances Deter Aggression? The Influence of Military Alliances on the Initiation of Militarized Interstate Disputes," *American Journal of Political Science* 47, no. 3 (2003): 427–439; Matthew Fuhrmann and Todd S Sechser, "Signaling Alliance Commitments: Hand-Tying and Sunk Costs in Extended Nuclear Deterrence," *American Journal of Political Science* 58, no. 4 (2014): 919–935; Paul C Avey, Jonathan N Markowitz, and Robert J Reardon, "Do US Troop Withdrawals Cause Instability? Evidence from Two Exogenous Shocks on the Korean Peninsula," *Journal of Global Security Studies* 3, no. 1 (2018): 72–92; Roseanne W. McManus, "Making It Personal: The Role of Leader-Specific Signals in Extended Deterrence," *Journal of Politics* 3, no. 80 (2018): 982–995.

3. As we discuss in the conclusion, whether alliances ultimately benefit the United States depends on a net assessment that incorporates the many political and economic benefits of security guarantees, not just the costs.

4. These two perspectives represent ideal types. Instead of falling neatly into one of these camps, scholars may

One line of thinking, which we call the *budget hawk* school, claims that alliances require large increases in defense spending. A *bargain hunter* perspective, by contrast, maintains that U.S. alliance commitments are relatively cheap and may actually reduce the defense budget.

Knowing which view is correct carries implications for scholarly debate about whether alliances increase or decrease military spending.[5] Adjudicating between the budget hawk and bargain hunter perspectives will also speak to a broader debate about the United States' role in the world. Arguments in favor of a more restrained foreign policy hinge heavily on the notion that alliance commitments necessitate large increases in U.S. defense spending.[6] John Mearsheimer and Stephen Walt begin their "bottom line" case for a restrained grand strategy by claiming that it "would allow the United States to markedly reduce its defense spending."[7] Stephen Brooks and William Wohlforth, who argue for continued deep U.S. engagement in world politics, aptly characterize the pervasiveness of this view in the restraint camp: "Almost no call for retrenchment is complete without invoking the budgetary costs of deep engagement, which is arguably the most prominent argument for pulling back in the wider public debate about U.S. foreign policy."[8] Evidence that U.S. alliances decrease (or only modestly increase) defense spending would therefore substantially weaken the case for restraint, while a large positive effect of alliances on expenditures would strengthen it.

Despite the importance of this question, the true spending costs of U.S. alliance commitments remain unclear. Few studies have attempted to systematically address this issue. As Mira Rapp-

accept some tenets of the budget hawk view and others from the bargain hunter school.

5. See, for example, Joshua Alley, "Alliance Participation and Military Spending" (Ph.D. Thesis, Texas A&M University, 2020); Matthew DiGiuseppe and Paul Poast, "Arms versus Democratic Allies," *British Journal of Political Science*, 2016, 1–23; Paul F Diehl, "Substitutes or Complements?: The Effects of Alliances on Military Spending in Major Power Rivalries," *International Interactions* 19, no. 3 (1994): 159–176.

6. See, for example, Eugene Gholz, Daryl G. Press, and Harvey M. Sapolsky, "Come Home, America: The Strategy of Restraint in the Face of Temptation," *International Security* 21, no. 4 (1997): 5–48; Christopher Layne, "From Preponderance to Offshore Balancing: America's Future Grand Strategy," *International Security* 22, no. 1 (1997): 86–124; Barry R Posen, *Restraint: A New Foundation for U.S. Grand Strategy* (Cornell University Press, 2014).

7. John J. Mearsheimer and Stephen M. Walt, "The Case for Offshore Balancing: A Superior U.S. Grand Strategy," *Foreign Affairs* 95, no. 4 (2016): 83.

8. Stephen G. Brooks and William C. Wohlforth, *America Abroad: Why the Sole Superpower Should Not Pull Back from the World* (Oxford University Press, 2016), 123.

Hooper observes, arguments about the budgetary implications of U.S. alliance commitments "are verifiable, yet, with a few exceptions, scholars have demurred."[9]

A large literature in political science and economics scrutinizes U.S. defense spending.[10] These studies call attention to a diverse set of explanatory factors such as political parties, unemployment, bureaucratic politics, path dependence, and military conflict. However, U.S. alliance commitments play little role in this body of work. Political scientists and economists have also published many books and articles about the general relationship between alliances and defense spending.[11] Virtually none of this work seeks to determine how changes in alliance commitments affect U.S. defense spending.[12] The research objective in these studies is instead to identify the average effect of alliances on military spending across a broad range of countries. There are good reasons to think that the United States might deviate from the general trend, however, because it is the strongest member of every defense pact it has forged since 1945. We therefore need theories and analysis that are specific to the U.S. context, which this article provides.

U.S. grand strategy has been relatively constant since 1945.[13] However, the number of U.S. alliance commitments has fluctuated considerably during this time as Washington took on new

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9. Mira Rapp-Hooper, *Shields of the Republic: The Triumph and Peril of America's Alliances* (Harvard University Press, 2020), 4.

10. See, for example, Alex Mintz, ed., *The Political Economy of Military Spending in the United States* (New York: Routledge, 1992); Benjamin O. Fordham, "Domestic Politics, International Pressure, and the Allocation of American Cold War Military Spending," *The Journal of Politics* 64, no. 1 (2002): 63–88; Rosella Cappella Zielinski and Kaija Schilde, "Hatchet or Scalpel?Domestic Politics, International Threats, and US Military Spending Cuts, 1950–2014," *Security Studies* 28, no. 4 (2019): 677–709.

11. See, for example, Mancur Olson and Richard Zeckhauser, "An Economic Theory of Alliances," *The Review of Economics and Statistics* 48, no. 3 (1966): 266–279; Todd Sandler, "The economic theory of alliances: a survey," *Journal of Conflict Resolution* 37, no. 3 (1993): 446–483; Glenn Palmer, "Alliance Politics and Issue Areas: Determinants of Defense Spending," *American Journal of Political Science* 34, no. 1 (1990): 190–211; Matthew Fuhrmann, "When Do Leaders Free-Ride? Business Experience and Contributions to Collective Defense," *American Journal of Political Science* 64, no. 2 (2020): 416–431.

12. Paul Diehl distinguishes between major and non-major powers but does not separate the United States from countries such as France and the United Kingdom – two states that many argue free-ride on Washington to some degree. See Diehl, "Substitutes or Complements?: The Effects of Alliances on Military Spending in Major Power Rivalries"

13. Stephen G Brooks, G John Ikenberry, and William C Wohlforth, "Don't Come Home, America: The Case Against Retrenchment," *International Security* 37, no. 3 (2013): 12. The biggest changes arguably occurred when Donald Trump was president.

commitments and abandoned some old ones. Membership also varies within the same alliance. To draw on the best-known example, NATO expanded eight times, going from 12 members in 1949 to 30 today. Such variation in the number of U.S. alliance commitments over time allows us to estimate how security guarantees influence U.S. defense expenditures.

We use a dynamic regression model to estimate how changes in alliance commitments from 1945 to 2019 influence the U.S. defense budget. Using this statistical model, we calculate the long-run budgetary impact of alliance commitments. This is important because the costs and savings of alliances accrue over many years, not just immediately after alliance formation. Our model also controls for the president's party, war intensity, and other confounding factors.

We find that the number of countries with U.S. protection is positively correlated with defense expenditures. Making one additional commitment increases the size of the U.S. defense budget by between $11 and $21 billion.[14] This is a large association considering that the total U.S. defense budget in 2019 was $686 billion.[15] A series of robustness tests, including the use of presidential fixed effects, consistently find a large positive association between new alliance commitments and defense spending.

These results support the budget hawk view and contradict the bargain hunter school. Many countries save money by forming military alliances.[16] However, based on our analysis, the United States is not one of them. Over the last 75 years, taking on an additional alliance commitment has, on average, considerably expanded the U.S. defense budget. This evidence bolsters a key tenet of the restraint approach to grand strategy. But it does not necessarily imply that the United States should terminate or rollback its existing alliance commitments, as many restrainers advocate. To know whether alliances are worth it for Washington, we must weigh the gains against the budgetary burden, a point that we return to in the paper's final section.

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14. Our most conservative estimate from a series of robustness checks suggests that a new alliance adds between $6 and $15 billion to the defense budget on average.

15. Patrick Collins, "Why Does the US Spend So Much on Defense?," *Defense One* January 26 (2020), `https://www.defenseone.com/ideas/2020/01/why-does-us-spend-so-much-defense/162657/`.

16. See, for example, DiGiuseppe and Poast, "Arms versus Democratic Allies."

This article proceeds in five sections. First, we describe the logic of the budget hawk school. Second, we lay out the arguments behind the bargain hunter perspective. Third, we describe our research strategy for estimating the budgetary effects of U.S. alliance commitments. Fourth, we present our findings. The fifth section concludes by discussing the implications of our results for U.S. grand strategy and foreign policy, as well as highlighting the limitations of our study.

Budget Hawks: U.S. Alliances Increase the Financial Burden

Many scholars have argued that U.S. alliances lead to massive defense spending increases.[17] U.S. presidents have similarly emphasized the cost of alliances to U.S. taxpayers. In January 1963, for example, John F. Kennedy privately complained to his advisers that the NATO allies were living off the "fat of the land" while his government spent large sums protecting Europe.[18] Budget hawks make a variety of arguments about the financial burden of U.S. alliance commitments. Our goal here is to lay out the full set of reasons why alliances might increase U.S. defense expenditures, not to characterize any single piece of scholarship.

Direct Costs of Protection

Defense pacts seek to deter third-party attacks and reassure allies that they can rely on partners for security. Countries must do a minimum of two things to make their alliance promises credible in the eyes of allies and potential attackers.[19] They must first have enough military capability to

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17. Eugene Gholz and Daryl G. Press, "The Effects of Wars on Neutral Countries: Why It Doesn't Pay to Preserve the Peace," *Security Studies* 10, no. 4 (2001): 1–57; Christopher Layne, "The Unipolar Exit: Beyond the Pax Americana," *Cambridge Review of International Affairs* 24, no. 2 (2011): 149–164; Benmjamin H. Friedman and Justin Logan, "Why the U.S. Military Budget Is 'Foolish and Sustainable'," *Orbis*, no. 56 (2012): 171–191.

18. Foreign Relations of the United States, "Remarks of President Kennedy to the National Security Council Meeting, January 22," 1961-1963, XIII (1963), `https://history.state.gov/historicaldocuments/frus1961-63v13/d168`; Michael Creswell and Victor Gavin, "A History of Vexation: Trump's Bashing of NATO Is Nothing New," *War on the Rocks* August 22 (2017), `https://warontherocks.com/2017/08/a-history-of-vexation-trumps-bashing-of-nato-is-nothing-new/`.

19. On the issue of credibility in alliance politics, see, for example, Thomas C. Schelling, *Arms and Influence* (New Haven: Yale University Press, 1966); James D. Fearon, "Signaling Foreign Policy Interests: Tying Hands versus

defend the ally. Yet capabilities alone are insufficient for success. The country offering protection must also convince other states that it would, in fact, intervene to fight on behalf of its ally in the event of war.

Establishing willingness to intervene is particularly challenging. Allies and potential aggressors have frequently questioned the credibility of an alliance promise, even when the protector has the capacity to fulfill it. For example, French leader Charles de Gaulle knew that the United States *could* defend France from a Soviet attack during the Cold War but doubted that Washington had the *political will* to defend another country more than 3,000 miles away. As a result, De Gaulle developed an independent nuclear arsenal and lessened French reliance on the United States. Fears of abandonment are not unfounded: countries have honored their alliance commitments in war just 22 percent of the time since 1945.[20] To protect other states, an alliance member must overcome skepticism about its resolve to defend an ally.[21]

Making alliance promises credible by demonstrating capability and will to intervene can be expensive. The budget hawk perspective emphasizes three costly measures that the United States takes to increase the credibility of its alliance commitments.

Military Technologies and Equipment

The United States must develop and procure military technologies to effectively defend allies. The large distance between the United States and its allies means that Washington needs considerable power projection capabilities. As David Ochmanek, who served as Deputy Assistant Secretary of Defense for Force Development during the Obama administration, put it, without the capacity to project power "over intercontinental distances . . . the credibility of the U.S. deterrent and of U.S.

Sinking Costs," *Journal of Conflict Resolution* 41, no. 1 (1997): 68–90; James D Morrow, "Alliances: Why Write Them Down?," *Annual Review of Political Science* 3 (2000): 63–83.

20. Molly Berkemeier and Matthew Fuhrmann, "Reassessing the Fulfillment of Alliance Commitments in War," *Research and Politics* April-June (2018): 1–5. See also Brett Ashley Leeds, Andrew G Long, and Sara McLaughlin Mitchell, "Reevaluating Alliance Reliability: Specific Threats, Specific Promises," *Journal of Conflict Resolution* 44, no. 5 (2000): 686–699.

21. Schelling, *Arms and Influence*, 36.

alliance commitments would erode."[22] The United States must maintain capabilities that allow the military to move people and equipment over large distances. Weapons systems that can hit faraway targets – including intercontinental ballistic missiles, submarines, aircraft carriers, and long-range bombers – are also critical for this goal.

Power projection is expensive. The U.S. Navy's Columbia-class program, for example, which intends to build 12 ballistic missile submarines, has an estimated acquisition cost of $103 billion.[23] The first Ford Class aircraft carrier, which was delivered in May 2017, cost $12.9 billion.[24] The Air Force is currently upgrading its land-based ICBM force of around 450 Minuteman III missiles at a total cost between $85 and $100 billion.[25]

These power projection capabilities, as well as many others, are located on U.S. territory or deployed at sea. Despite their location, the United States could use them to defend allies. In response to a hypothetical North Korean nuclear strike against Seoul, for example, the United States could level any North Korean city using ICBMs launched from Montana, North Dakota, or Wyoming. However, domestic and sea-based deployments may be insufficient for deterrence and reassurance in some situations. This brings us to our next point: to make its alliance promises more effective, Washington may need to deploy personnel and weapons on allied territory.

Overseas Bases

Washington maintains a vast network of overseas military bases. The most recent Department of Defense (DOD) *Base Structure Report* indicates that the United States has 514 bases in 45

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22. David Ochmanek, "Restoring U.S. Power Projection Capabilities: Responding to the 2018 National Defense Strategy," *Rand Perspective* July, no. PE-260-AF (2018): 3.

23. Congressional Research Service, *Navy Columbia (SSBN-826) Class Ballistic Missile Submarine Program: Background and Issues for Congress* (Washington, D.C.: CRS, 2020).

24. United States Government Accountability Office, *Ford-Class Aircraft Carrier: Follow-On Ships Need More Frequent and Accurate Cost Estimates to Avoid Pitfalls of Lead Ship* (Washington, D.C.: GAO, 2017).

25. Joseph Trevithick, "Why Does the US Spend So Much on Defense?," *The War Zone* August 22 (2017), `https://www.thedrive.com/the-war-zone/13715/usaf-awards-contractors-big-bucks-for-new-icbms-but-future-of-missiles-is-uncertain`.

foreign countries.[26] Nearly 80 percent of these bases are located in three U.S. allies: Germany, Japan, and South Korea. U.S. overseas bases vary in size. About five percent (24) of them are classified by DOD as large sites valued at more than $2 billion.[27]

Using overseas bases to forward-deploy troops and military equipment is expensive. A 2019 Congressional Budget Office analysis found that the annual base operations support (BOS) costs of overseas bases were 27 percent higher, on average, than the BOS costs for domestic sites even after controlling for base characteristics such as geographic size and the number of employees.[28] Operating a single overseas base entails between $50 million and $200 million per year in fixed costs plus anywhere from $10,000 to $40,000 per person in variable costs.[29] The total cost of basing abroad may be as high as $85 to $100 billion each year.[30]

Based on one line of thinking, these expenses are necessary to maintain healthy alliances. Overseas military deployments augment the capacity of the United States to defend its allies in the event of an attack. But they may also add credibility to American security assurances. Foreign deployments can serve a "tripwire" function. An invasion of a U.S. ally would probably target U.S. military personnel and equipment on the ally's soil. Any loss of American life would make it exceedingly difficult for the United States to remain on the sidelines during the conflict. Placing forces on an ally's territory thus increases U.S. political will to intervene on its ally's behalf in the alliance is challenged.[31]

In addition, military bases provide a visible symbol of U.S. resolve to defend an ally.[32] General

26. U.S. Department of Defense, *Base Structure Report - Fiscal Year 2018 Baseline* (Washington, D.C.: DOD, 2018), 7.

27. This is based on the sites' permanent replacement value (PRV).

28. Congressional Budget Office, *The Cost of Supporting Military Bases* (Washington, D.C.: Congress of the United States, 2019), 11.

29. Michael J. Lostumbo et al., *Overseas Basing of U.S. Military Forces: An Assessment of Relative Costs and Strategic Benefits* (Santa Monica, CA: RAND Corporation, 2013), xxv.

30. David Vine, *Base Nation: How U.S. Military Bases Abroad Harm America and the World* (New York: Metropolitan Books, 2015). These figures are based on data for 2014.

31. Schelling, *Arms and Influence*, 47.

32. Alexander Cooley, *Base Politics: Democratic Change and the U.S. Military Overseas* (Ithaca, NY: Cornell University Press, 2008), 7.

Vincent Brooks, the United States Forces Korea (USFK) commander, underscored this point when discussing the garrison at Pyeongtaek that is expected to house 45,000 Americans by 2022: the base is a "significant investment in the long-term presence of U.S. Forces in Korea," he said, and provides "living proof of the American commitment to the alliance."[33] Base costs, then, may be a necessary feature of alliances. By "sinking costs" to defend an ally, the United States signals that it is determined to uphold its promise, since a less resolved country would not incur that expense.[34]

Alliance Coordination

U.S. alliances require coordination, as coalition forces must be able to fight together in order to be militarily effective.[35] Taking measures to facilitate joint warfighting in peacetime also bolsters deterrence by signaling to third-parties that the United States and its partners are ready for a coordinated fight.[36] Yet fighting jointly is often challenging because each alliance partner may have unique military strategies and doctrines, as well as different weapons and means of communication.[37]

To improve alliance coordination, countries sometimes establish a joint headquarters or military command. The NATO Command Structure (NCS), for example, includes a permanent multinational headquarters that harmonizes military actions across the alliance. This effort carries substantial personnel and infrastructure costs: NATO had 22,000 staff across 33 commands when the Soviet Union collapsed and currently has 6,800 personnel in seven commands.[38] Joint military

33. Quoted in Joseph Hincks, "Inside Camp Humphreys, South Korea: America's Largest Overseas Military Base," *Time* July 11 (2018), `https://time.com/5324575/us-camp-humphreys-south-korea-largest-military-base/`.

34. Fearon, "Signaling Foreign Policy Interests: Tying Hands versus Sinking Costs"; Fuhrmann and Sechser, "Signaling Alliance Commitments: Hand-Tying and Sunk Costs in Extended Nuclear Deterrence."

35. On the challenges of military coalitions, see, for example, Sarah E. Kreps, *Coalitions of Convenience: United States Military Interventions after the Cold War* (New York: Oxford University Press, 2011); Scott Wolford, *The Politics of Military Coalitions* (New York: Cambridge University Press, 2015).

36. Paul Poast, *Arguing About Alliances: The Art of Agreement in Military-Pact Negotiations* (Ithaca, NY: Cornell University Press, 2019), 2.

37. Erik Lin-Greenberg, "Allies and Artificial Intelligence: Obstacles to Operations and Decision-Making," *Texas National Security Review* 3, no. 2 (2020): 56–76.

38. NATO, "The NATO Command Structure," *NATO Factsheet* February (2018), `https://www.nato.in`

exercises are another way of improving alliance cohesion. NATO, for instance, conducted 102 military exercises in 2019 to "ensure that NATO forces are trained, able to operate together and ready to respond to any threat from any direction."[39] Measures such as these enhance cohesion but also necessitate additional spending.

Compensating for Free-Riding

The direct costs of protection are the most obvious but they are not the only ones, according to the budget hawk school. Allies may be able to "free-ride" on the United States by reducing their defense expenditures, requiring Washington to shoulder a disproportionate share of the burden of providing security. The notion of alliance free-riding dates back to work by Mancur Olson and Richard Zeckhauser.[40] They argued that military alliances provide public goods, as collective defense is non-excludable, so all alliance partners benefit from security no matter how much they contribute. As a result, U.S. allies can safely reduce their defense spending as long as Washington protects them.

U.S. officials from both major political parties have long complained about free-riding. Barrack Obama, for example, put it bluntly in a 2016 interview: "free riders aggravate me."[41] These complaints have some justification, as U.S. allies do under-invest in defense, at least under some circumstances.[42] Free-riding is a problem for the United States, based on the budget hawk school of thought, because Washington must spend more to compensate for disproportionately small al-

t/nato_static_fl2014/assets/pdf/pdf_2018_02/1802-Factsheet-NATO-Command-Structure_en.pdf.

39. NATO, "Key NATO and Allied Exercises in 2019," *NATO Factsheet* February (2019), https://www.nato.int/nato_static_fl2014/assets/pdf/pdf_2019_02/1902-factsheet_exercises_en.pdf.

40. Olson and Zeckhauser, "An Economic Theory of Alliances."

41. Quoted in Jeffrey Goldberg, "The Obama Doctrine: The U.S. President Talks Through His Hardest Decisions About America's Role in the World," *The Atlantic* April (2016), https://www.theatlantic.com/magazine/archive/2016/04/the-obama-doctrine/471525/.

42. See, for example, Thomas Plümper and Eric Neumayer, "Free-Riding in Alliances: Testing An Old Theory With a New Method," *Conflict Management and Peace Science* 32, no. 3 (2015): 247–268; Fuhrmann, "When Do Leaders Free-Ride? Business Experience and Contributions to Collective Defense."

lied contributions.[43] U.S. leaders may try to overcome free-riding by encouraging allies to share more of the security burden, but even when these inducements work they can require additional expenditures. For example, the United States sometimes uses side-payments to persuade allies to join a military coalition.[44]

Bailing Out Reckless Allies

A related concern is that U.S. allies may pull Washington into unwanted military disputes. Knowing that they have U.S. protection, weaker allies may take more risks and provoke military confrontations. For example, Chiang Kai-shek felt emboldened by U.S. defense promises during the two serious Taiwan Strait crises of the 1950s.[45] The moral hazard problem in military alliances has implications for the U.S. defense burden. If allied provocations lead to conflict with a third-party, Washington might be forced to launch a costly intervention to bail out its partner or defuse the conflict.[46] In the absence of credible security guarantees, the United States would not have to shoulder these costs.

Bargain Hunters: U.S. Alliances Save Money

The bargain hunter perspective offers an alternative view: that U.S. alliance commitments generate costs savings or modest increases in U.S. defense spending.[47] As with the budget hawk school, we strive to put forth the strongest possible argument in defense of this perspective. Not every scholar or policymaker in this camp advances all of the arguments we include in this school, but they all support the same overarching conclusion.

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43. Diehl, "Substitutes or Complements?," 167; and Posen, *Restraint*, 34.
44. Wolford, *The Politics of Military Coalitions*, 3.
45. Brett V Benson, *Constructing International Security: Alliances, Deterrence, and Moral Hazard* (Cambridge University Press, 2012).
46. See Posen, *Restraint: A New Foundation for U.S. Grand Strategy*, 44.
47. See, for example, Rapp-Hooper, *Shields of the Republic: The Triumph and Peril of America's Alliances*, 78.

Alliances Generate Efficiencies

The budget hawk perspective emphasizes how weaker alliance partners free-ride on the United States. By contrast, bargain hunters claim that the free-riding logic is flawed. Free-riding is possible if alliances generate public goods. Scholars have long recognized, however, that the benefits of alliances might be excludable.[48] It is prohibitively expensive to allow some people to breathe clean air while preventing others from doing so. By contrast, U.S. investments in extended deterrence may benefit some allies but not others. The substantial military presence in Germany, for example, is probably insufficient to stop a Russian invasion of Estonia. Moreover, Washington could decide to abandon an ally. Viewed from this perspective, free-riding is a risky strategy.[49]

There is evidence consistent with this view: free-riding is generally rare[50] and free-riding on the United States is less common than the budget hawk perspective suggests. There is likely within-country variation in free-riding among NATO allies. Some leaders – particularly those with high self-efficacy and feelings of power – free-ride on the United States by cutting defense expenditures, but others make sizable contributions to collective defense and emphasize paying their fair share.[51]

Bargain hunters also contend that alliances reduce *U.S.* military spending by generating efficiencies. Even as allies rely on the United States, Washington gets valuable help from its partners. As Brooks, Wohlforth, and Ikenberry argue, we should think about alliances through a bargaining framework – not a public goods one – whereby allies divide labor as "part of a complex hegemonic bargain."[52] In this view, allies often divide labor in ways that benefit the U.S. bottom line, compared to a situation where Washington had no partners. Obama acknowledged this in the same 2016 interview where he complained about free-riding, saying: "We don't have to always be the ones who are up front . . . Sometimes we're going to get what we want precisely because we are sharing

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48. See, for example, Sandler, "The economic theory of alliances: a survey."
49. Fuhrmann, "When Do Leaders Free-Ride? Business Experience and Contributions to Collective Defense."
50. Joshua Alley, "Reassessing the public goods theory of alliances," *Research & Politics* 8, no. 1 (2021): 1–7.
51. Fuhrmann, "When Do Leaders Free-Ride? Business Experience and Contributions to Collective Defense."
52. Brooks, Ikenberry, and Wohlforth, "Don't Come Home, America: The Case Against Retrenchment," 28.

in the agenda."[53]

Alliance partners often assist in U.S.-led military operations, and their contributions reduce U.S. costs.[54] To illustrate, during Operation Enduring Freedom, the post-9/11 campaign against the Afghan Taliban, more than 3,000 foreign troops joined 19,000 U.S. forces.[55] Aside from troops, the White House acknowledged substantial contributions from allies in support of combat operations: France provided 24 percent of its total naval forces, including its only carrier battle group; Italy also provided a carrier battle group and 13 percent of its total naval capabilities; Great Britain gave the coalition its only Tomahawk Land Attack Missiles (TLAMs); and Turkey provided KC-135 refueling support for U.S. planes in transit.[56]

Furthermore, some allies directly offset the cost of U.S. bases on their territory. South Korea, Germany and Japan all provide the United States with cash contributions, reduced rent, and waivers of taxes and damage fees. Identifying the precise magnitude of these contributions is difficult, but one estimate suggests that Japan offsets between $2 and $6 billion of the annual cost of U.S. bases.[57] Along similar lines, allies sometimes make direct financial contributions to support U.S. military endeavors. Although Germany did not provide troops during the Persian Gulf War, it gave $1 billion to the U.S.-led war effort in 1990 and promised an additional $5.5 billion to the United States in 1991.[58]

Allies also provide unique capabilities, resources, or expertise that the United States would

53. Goldberg, "The Obama Doctrine: The U.S. President Talks Through His Hardest Decisions About America's Role in the World."

54. Kreps, *Coalitions of Convenience: United States Military Interventions after the Cold War*.

55. U.S. Department of State, "Operation Enduring Freedom," January 31 (2006), `https://2001-2009.state.gov/r/pa/prs/ps/2006/60083.htm`.

56. The White House, "International Contributions to the War Against Terrorism and Operation Enduring Freedom," `https://georgewbush-whitehouse.archives.gov/march11/coalitioncontributions.html`.

57. Lostumbo et al., *Overseas Basing of U.S. Military Forces: An Assessment of Relative Costs and Strategic Benefits*, 143-49.

58. John M. Goshko, "Germany to Complete Contribution Toward Gulf War Costs Thursday," *The Washington Post* March 27 (1991), `https://www.washingtonpost.com/archive/politics/1991/03/27/germany-to-complete-contribution-toward-gulf-war-costs-thursday/8af9f5b5-ef7d-4b0c-84cb-2afcdbf522d6/`.

otherwise have to build itself. Estonia, for example, does not offer much conventional military capability, but it has specialized knowledge in cyber warfare, which has helped formulate cyber policy within NATO.[59] U.S. allies also have superior minesweeping capabilities. Clearing mines was critical during the Persian Gulf War in order to maintain safe shipping routes. U.S. allies led the way in this task: they cleared more than 1,000 mines in the Gulf, while the U.S. Navy destroyed just 248.[60] Though larger U.S. investments in minesweepers are possible, relying on allies makes them unnecessary.

Reducing Conflict Lessens the U.S. Budgetary Burden

Budget hawks fear that alliances will pull the United States into conflicts, necessitating further military expenditures. However, alliances may instead restrain partners. U.S. allies value protection from a nuclear-armed superpower and understand that acting recklessly may lead to alliance termination or rollback. U.S. allies therefore have strong incentives avoid picking fights or adopting aggressive foreign policies. Consistent with this view, some studies show that defense pacts with nuclear powers like the United States do not increase – and may decrease – the likelihood that a state will instigate military disputes.[61]

Alliances also promote peace through extended deterrence, especially if they include a nuclear power.[62] Making an investment in an alliance, therefore, can save money by avoiding wars or crises that might otherwise happen.[63] Saddam Hussein invaded Kuwait in 1990, in part because

59. Lin-Greenberg, "Allies and Artificial Intelligence: Obstacles to Operations and Decision-Making."

60. R. Thompson, *Lessons Not Learned: The U.S. Navy's Status Quo Culture* (Naval Institute Press, 2013).

61. Neil Narang and Rupal N. Mehta, "The Unforeseen Consequences of Extended Deterrence: Moral Hazard in a Nuclear Client State," *Journal of Conflict Resolution* 63, no. 1 (2019): 218–250; Matthew Fuhrmann and Todd S. Sechser, "The Moral Hazard Myth: Nuclear Umbrellas and Reckless Allies" (Presented at the Annual Meeting of the International Studies Association, 2014).

62. Brett Ashley Leeds, "Do Alliances Deter Aggression? The Influence of Military Alliances on the Initiation of Militarized Interstate Disputes," *American Journal of Political Science* 47, no. 3 (2003): 427–439; Fuhrmann and Sechser, "Signaling Alliance Commitments: Hand-Tying and Sunk Costs in Extended Nuclear Deterrence."

63. Hal Brands and Peter D. Feaver, "What Are America's Alliances Good for?," *Parameters* 47, no. 2 (2017): 18. See also Elbridge Colby and Jim Thomas, "The Future of Alliance," *The National Interest*, no. 144 (2016): 37, ISSN: 08849382, 19381573, https://www.jstor.org/stable/26557320.

he doubted that the United States would fight to reverse Iraq's territorial gains. Would Saddam have reached a similar conclusion if the United States had a formal defense pact with Kuwait? If so, such an alliance would have prevented the subsequent loss of blood and treasure in the Persian Gulf War. To the bargain hunter school, prevention is cheaper than treatment.

Some Direct Costs Are Unnecessary for Alliance Credibility

The budget hawk perspective claims that alliance credibility depends on sinking tremendous costs. In this view, a defense pact will not deter aggression unless the United States spends billions of dollars on military equipment for allies, overseas bases, and preparations for joint warfighting. Demonstrating resolve to defend an ally is undoubtedly important for extended deterrence and reassurance – but sinking costs is not the only way to establish credibility.

Hand-tying signals can also convey information about a country's willingness to fight on behalf of an ally.[64] Unlike sinking costs, tying hands is not immediately costly but can become expensive if a commitment is challenged. Public threats are a classic hand-tying signal.[65] Signing an alliance treaty can also be an effective hand-tying device. Although there are some up-front diplomatic and political costs associated with negotiating an alliance treaty, the biggest costs come into play if an ally is attacked. A state could, of course, abandon their ally and avoid a costly war. But countries that shirk their alliance promises damage their reputation.[66] Potential attackers know that countries want to protect their reputations, which contributes to the credibility of a public defense pact.

There is evidence that hand-tying is effective in an alliance context – perhaps more so than sinking costs. Matthew Fuhrmann and Todd Sechser find that countries that have defense pacts with nuclear powers are less vulnerable to military aggression than their counterparts that lack this pro-

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64. On the difference between hand-tying and sunk costs, see Fearon, "Signaling Foreign Policy Interests: Tying Hands versus Sinking Costs."

65. See, for example, Kenneth A. Schultz, *Democracy and Coercive Diplomacy* (New York: Cambridge University Press, 2001).

66. Douglas M. Gibler, "The Costs of Reneging: Reputation and Alliance Formation," *Journal of Conflict Resolution* 52, no. 3 (2008): 426–454; Mark J.C. Crescenzi et al., "Reliability, Reputation, and Alliance Formation," *International Studies Quarterly* 56, no. 2 (2012): 259–74.

tection.[67] However, conditional on the existence of a defense pact, their analysis shows that sinking costs by deploying nuclear weapons on the ally's territory does not significantly add to extended deterrence. U.S. allies also seem to value the alliance promise itself more than military deployments. Similarly, Jiyoung Ko's experimental analysis shows that the South Korean public feels reassured by U.S. public declarations of protection but that forward-deployment of nuclear forces do not bolster this effect.[68] This evidence suggests that the United States can achieve credibility without expensive military deployments overseas – as long as it maintains the capabilities needed to fight on the ally's behalf and states its intentions publicly. The overall cost of U.S. alliances, then, may be smaller than it initially appears.

Many analysts assume that all U.S. defense commitments are NATO-like arrangements with high direct costs. But many U.S. commitments are more limited. Washington is obligated by treaty to defend most of Latin America from external attack, but there is not a huge U.S. military presence on the territory of those states. In 2000, for example, the United States had just over 2,000 troops stationed in all of South America and the Caribbean and 112,000 in Europe.[69] When making the case that alliances are expensive, budget hawks highlight the priciest commitments. As some alliance commitments have modest direct costs, alliances may not generate a large financial burden on average.

On top of this, much of the cost-sinking discussed by budget hawks is not causally connected to military alliances, based on the bargain hunter line of thinking. The United States projects power in order to deter attacks against its homeland, broadly influence the behavior of its adversaries, and ensure open access the the global commons – not just protect allies. Expenses that are seemingly made on behalf of allies also provide private benefits to the United States. Lt. Gen. Frederick

67. Fuhrmann and Sechser, "Signaling Alliance Commitments: Hand-Tying and Sunk Costs in Extended Nuclear Deterrence."

68. Jiyoung Ko, "Alliance and Public Preference for Nuclear Forbearance: Evidence from South Korea," *Foreign Policy Analysis* 15, no. 4 (December 2018): 509–529, ISSN: 1743-8586, doi:10.1093/fpa/ory014, eprint: https://academic.oup.com/fpa/article-pdf/15/4/509/29961596/ory014.pdf, https://doi.org/10.1093/fpa/ory014.

69. Tim Kane, *Global U.S. Troop Deployment, 1950–2003* (Washington, D.C.: Heritage Foundation, 2004).

Hodges, who once served as the top U.S. Army commander in Europe, put it bluntly: "The reason we have troops overseas in Germany is not to protect Germans, everything we have is for our benefit."[70]

Testable Predictions

The preceding discussion offers two contrasting views about the financial costs of U.S. alliance commitments. How do we know which view is correct? The first step in answering this question is to identify testable hypotheses that follow from each view.

Budget Hawk Hypothesis: Alliance commitments increase U.S. defense expenditures.

Bargain Hunter Hypothesis: Alliance commitments do not reliably increase, and may decrease, U.S. defense expenditures.

A negative or null relationship between alliance commitments and defense spending would clearly confirm the bargain hunter perspective, while contradicting the budget hawk view. However, a positive relationship would not necessarily refute the bargain hunter perspective. Some bargain hunters argue that alliances have a net-neutral effect on the defense budget as long-term savings offset short-run costs.[71] Others accept that alliances may raise U.S. defense spending but contend that these increases are relatively small. Therefore, we consider the direction and magnitude of the relationship between alliances and military spending.

It is also possible that both perspectives are correct to some degree. U.S. alliance commitments may increase spending in some ways and generate cost savings in others. We assess the net effect. Furthermore, a substantively large effect would not necessarily mean that the bargain hunter arguments are wrong – just that the financial burdens of U.S. alliance commitments swamp any cost

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70. Quoted in Michael Crowley and Julian E. Barnes, "Trump Plans to Withdraw Some U.S. Troops From Germany, A Key NATO Ally," *The New York Times* June 12 (2020), `https://www.nytimes.com/2020/06/05/world/europe/trump-troops-europe-nato-germany.html`.

71. See, for example, Rapp-Hooper, *Shields of the Republic: The Triumph and Peril of America's Alliances*; Colby and Thomas, "The Future of Alliance."

savings.

Research Strategy: Getting to the Truth

Our research objective is to identify both the direction and the magnitude of the relationship between alliance commitments and U.S. defense spending. This is a challenging task because the U.S. defense budget does not clearly delineate alliance-specific costs. Some costs that are seemingly straightforward to calculate, such as the personnel and equipment costs associated with defending Europe, are not clearly specified in the budget.[72] On top of this, as the preceding discussion underscores, many of the financial costs and benefits of alliance commitments could not plausibly have a budgetary line-item.

One solution is to calculate the total cost of U.S. grand strategy rather than the burden of alliances per se. Taking this approach, Posen estimates the cost of alliances based on the savings the United States could generate if it abandoned the force structure necessary to maintain them.[73] However, we want to separate the costs of commitments from the broader financial burden of U.S. grand strategy, which has been relatively constant after 1945. The United States seeks global power projection capabilities to defend many of its own interests, not just defend allies. As a result, looking at the total force structure costs could overstate the financial toll of defense pacts. On the other hand, this could also miss some of the "hidden" costs associated with free-riding and moral hazard, thereby understating the true financial burden. We therefore need a different approach.

To estimate the financial costs of U.S. alliances, we rely on temporal variation in the number of states with a formal U.S. security guarantee. After making zero formal defense commitments between 1779 and World War II, the United States entered a new era and began offering treaty-backed protection to other countries. This started with the Act of Chapultepec in 1945 (which

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72. Barry R Posen, "The High Costs and Limited Benefits of America's Alliances," *The National Interest* August 7 (2016), `https://nationalinterest.org/blog/the-skeptics/the-high-costs-limited-benefits-americas-alliances-17273`.

73. Posen, *Restraint: A New Foundation for U.S. Grand Strategy*.

led to the Rio Pact two years later) and continues through today as NATO expands. Although the number of states under U.S. protection has generally increased over the last 70 years, there have been decreases too. The United States scrapped its defense commitment to Iran, for example, after the 1979 Islamic Revolution. In light of this variation, we can estimate how changes in the number of defense commitments alter U.S. defense spending over time.

We do so with a statistical model of U.S. military spending from 1947 to 2019. The model allows us to estimate the impact of alliances on budgetary changes over time by adjusting for confounding variables, such as the president's political party. This approach will pick up the full financial costs and benefits of U.S. alliances, including those that are difficult to directly observe.

Estimation Challenges and Solutions

We begin by examining trends in alliance commitments and military spending. To measure U.S. alliance commitments, we use the Alliance Treaty Obligations and Provisions (ATOP) database to identify countries with a formal alliance treaty.[74] We focus on the number of countries with U.S. protection – rather than a count of alliance treaties – to capture variation in the size of the agreements.[75] This approach also allows us to account for changes in membership over time within the same alliance, such as the waves of NATO expansion after 1949. We obtain military spending data from the Stockholm International Peace Research Institute (SIPRI), which measures defense spending in millions of 2011 U.S. dollars.[76] To facilitate substantive interpretation, we divide the SIPRI military spending variable by 1,000 to express it in billions of dollars.

Figure 1 plots temporal trends in U.S. alliance commitments and defense expenditures after World War II. We show the overall levels of these variables in each year. The figure illustrates

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74. Brett Leeds et al., "Alliance Treaty Obligations and Provisions, 1815-1944," *International Interactions* 28, no. 3 (2002): 237–260.

75. There is less variation in the number of treaty commitments, which falls even as the number of states with a formal U.S. security commitment increases. Changes in alliance treaties are largely driven by bilateral alliances, since there has not been a new multilateral alliance since 1954.

76. SIPRI, *SIPRI Yearbook 2019: Armaments, Disarmament and International Security* (Oxford: Oxford University Press, 2019).
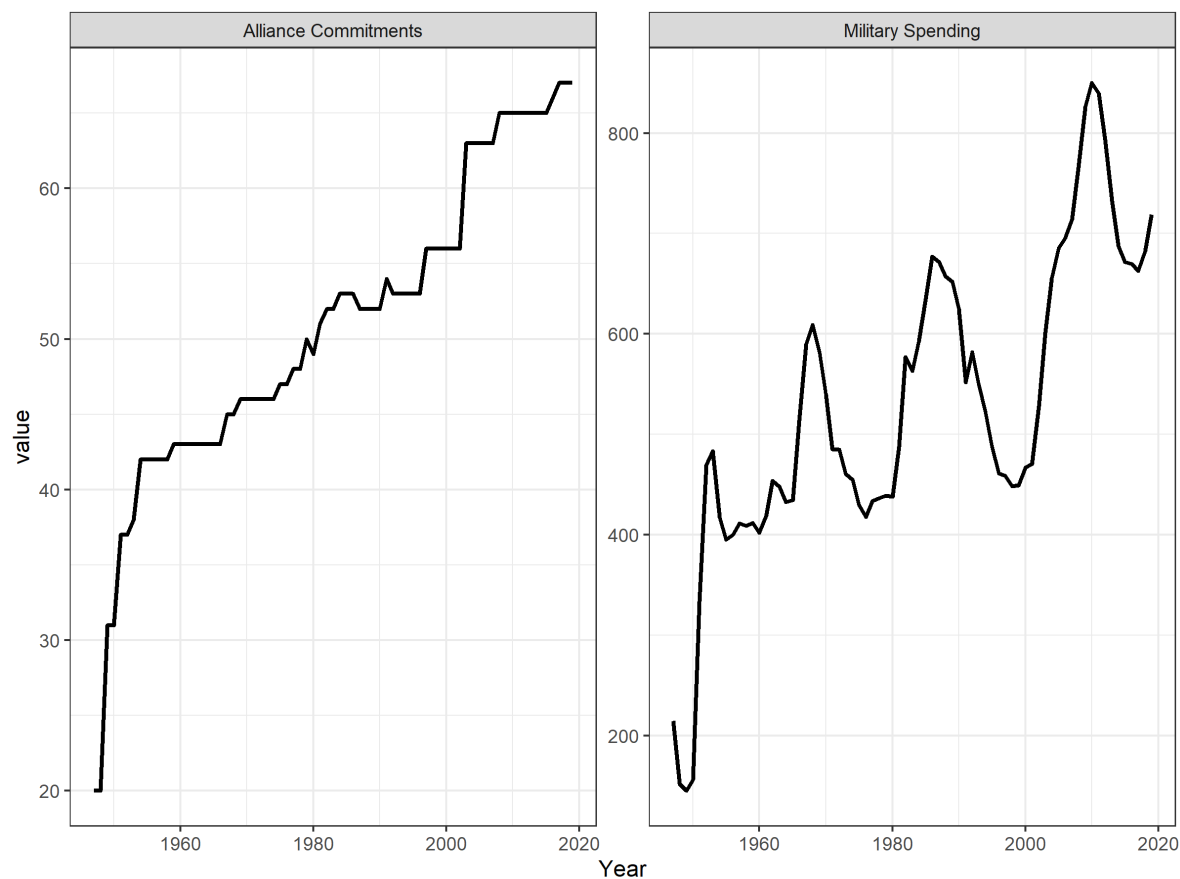
Figure 1: Time series of U.S. alliance commitments and defense spending from 1947 to 2019.

that both spending and commitments increased considerably after 1947. The number of alliance commitments jumps as NATO and other treaties enter into force in the 1950s, before stabilizing with a gradual upward trend. Military spending peaks during the Korean War, the Vietnam War, the defense buildup during the Reagan administration, and the 2003 Iraq War.

To accurately estimate the relationship between alliance commitments and military spending, we have to account for correlations between past and current values of both variables. Figure 1 suggests that both alliances and military spending are highly autocorrelated, meaning that past values of each variable seem to strongly predict current values. It is therefore possible that a simple correlation between these two variables could reflect simultaneous increases over time rather than a real relationship. Put differently, a standard regression with two autocorrelated or non-stationary

variables could easily generate spurious findings.[77]

Given persistence in alliance commitments and military spending over time, we use an autoregressive distributed lag model to estimate the correlation between alliances and defense spending. The key independent variable in this model is the lagged number of alliance commitments, and we also use a one-year lag of military spending to predict current military spending. This regression model specification assumes that any effect of changing the number of U.S. alliances on military spending takes place over many years. As the above discussion of the budget hawk and bargain hunter schools underscores, the financial burdens and savings generated by alliances may not necessarily happen immediately.

Dynamic regression models can take many forms. Some models are best when the independent or outcome variable has long memory, otherwise known as a unit root.[78] The problem is that reliably identifying the dynamic properties of alliances, military spending, and other determinants of military spending is difficult. Existing tests for unit roots struggle to identify the specific dynamic properties of a series, especially in smaller samples or cases of high autocorrelation that are close to but less than integrated. Unit root tests for integration have low power and are very sensitive to specification choices like trend, drift, and lag length.[79]

To overcome this issue, we use a more general and robust technique to identify whether there is a long-run relationship between alliances and military spending. A long-run relationship implies that changes in alliances dynamically affect military spending. To determine whether alliances and defense spending are in a long-run relationship, we employ a long-run multiplier bounds test.[80] This analysis uses coefficients from regression models to identify long-run relationships regardless

77. Clive WJ Granger and Paul Newbold, "Spurious Regressions in Econometrics," *Journal of Econometrics* 2, no. 2 (1974): 111–120.

78. Specifically, error correction models assume that the outcome and key variable are unit roots. We do not present error correction models in the paper, but we find some evidence of cointegration and very similar long-run effects of alliances with this specification.

79. Clayton Webb, Suzanna Linn, and Matthew Lebo, "A Bounds Approach to Inference Using the Long Run Multiplier," *Political Analysis* 27, no. 3 (2019): 281–301.

80. Clayton Webb, Suzanna Linn, and Matthew J Lebo, "Beyond the Unit Root Question: Uncertainty and Inference," *American Journal of Political Science* 2, no. 64 (2020): 275–292.

of the dynamic properties of the outcome and independent variable and accommodates uncertainty about the dynamic properties of the variables. In our model, the bounds test uses the lagged alliance commitments and lagged military spending coefficient estimates. We find that the long-run multiplier estimate has a test-statistic greater than the upper bound of the long-run multiplier test.[81] As a result, we can conclude that there is a long-run relationship between alliances and military spending.[82]

The testing procedure for long-run relationships performs well in small samples,[83] which is essential because we have 73 observations. Such limited sample sizes are common in social science time series, and time-series methods in political science can make reasonable inferences with even smaller samples than ours.[84] The small sample does increase uncertainty in our estimates, however. Based on these test results, we have sufficient confidence to proceed with using a dynamic regression technique to estimate the relationship between U.S. alliances and military spending.

In estimating the effect of alliance commitments on U.S. military spending, we consider two functional forms for the relationship. It is possible that as total U.S. alliances increase, the marginal cost of new alliances falls. Perhaps adding one alliance when there are 40 alliance commitments is less costly than adding one alliance to 15 commitments, for example. Models with the total number of commitments assume that the effect of adding one alliance is roughly constant. In a second model, we relax that assumption by logging the number of alliance commitments before including the logged commitments variable in lags in the model. This transformation of the alliance commitments variable is a simple way to capture a potential non-linear relationship between alliances and U.S. military spending. The long-run multiplier bounds test suggests that there is also a long-run relationship between logged alliance commitments and military spending. One drawback of this approach, however, is that the log alliance commitments coefficient estimates have a less intuitive

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81. To be precise, the long-run multiplier test statistic is 6.7 and the conservative upper bound is 3.59.

82. Webb, Linn, and Lebo, "A Bounds Approach to Inference Using the Long Run Multiplier," 293.

83. Ibid.

84. See, for example, Erica Owen and Dennis P. Quinn, "Does Economic Globalization Influence the US Policy Mood?: A Study of US Public Sentiment,1956–2011," *British Journal of Political Science* 46, no. 1 (2014): 95–125.

interpretation.

Another concern is that an apparent relationship between alliance commitments and military spending could be driven by other factors. Changes in the international threat environment, for instance, could explain some of the contemporaneous movement in alliance formation and defense expenditures shown in Figure 1. We control for several potential confounding variables to reduce omitted variable bias, which occurs when a statistical model does not account for factors that are correlated with the key independent variable and the outcome.[85] We lag most of the control variables because we expect that, like alliances, changes in these factors affect the budget in the long-run.

- **Log Combat Fatalities**. We included the log of annual U.S. military combat fatalities as a measure of international conflict intensity.[86] More intense military threats increase defense expenditures and might also drive countries to seek more alliance partners.

- **Lag Major Power Rival Spending**. To account for the broader international threat environment, our model controls for lagged spending by all major power strategic rivals.[87]

- **Post-Conflict Years**. We included a dummy indicator for the five years after a war ends to capture post-conflict peace dividends and the reduced need for alliances once hostilities end.

- **Cold War**. To account for the superpower competition between the United States and the Soviet Union, which drove up spending and alliance formation, we control for Cold War years with a binary indicator.[88]

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85. We consider additional control variables and many model specifications in the appendix, and show that our lagged alliance commitments coefficient is fairly consistent across model specifications.

86. To get full coverage from 1947 to 2019, we compiled data on fatalities from three sources: Mintz, *The Political Economy of Military Spending in the United States*; the Defense Manpower Data Center; and icasualties.org.

87. We identified strategic rivalry years with Russia and China using data from William R. Thompson and David R. Dreyer, *Handbook of International Rivalries 1494–2010* (Washington, DC: CQ Press, 2012). We then combined rebased data from the Correlates of War and SIPRI to measure Russian and Chinese military spending. See the appendix for results with a variety of other threat controls, including interstate disputes, international crises, and just Russian spending.

88. The Cold War dummy variable is equal to one before 1991 and is zero afterwards.

- **Lag Change in GDP**. We control for economic growth because the United States had more resources to invest in defense and military alliances during periods of economic prosperity.

- **Lag Budget Deficit**. As a second indicator of the opportunity costs of military spending, we account for the lagged budget deficit.

- **Republican President**. We control for presidential partisanship with a lagged dummy indicator for whether the president was a Republican, as Republican leaders tend to be more hawkish and wary of international entanglements.

Additional presidential administration-specific factors could also influence alliances and defense spending. Although U.S. grand strategy has been relatively constant since 1945, there have been differences in national security priorities across presidents. As described below, after presenting our initial results, we account for these differences by adding presidential fixed effects to our models.

Findings

Table 1 provides the results from our regression models of U.S. defense expenditures from 1947 to 2019. Model 1 uses the total number of security guarantees to construct our independent variables and Model 2 is based on logged alliance commitments.

The coefficient on the alliance commitments variable is positive and the 95 percent confidence intervals exclude zero in Models 1 and 2. This suggests that alliance commitments are positively correlated with defense expenditures, as the budget hawk school expects, regardless of whether we model this relationship as linear (Model 1) or characterized by diminishing marginal costs (Model 2). Although the direction of the effect is informative, statistical significance is a poor indicator of substantive importance.[89] We want to know the magnitude of the association between alliance

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89. Kelly McCaskey and Carlisle Rainey, "Substantive Importance and the Veil of Statistical Significance," *Statistics, Politics and Policy* 6, nos. 1-2 (2015): 77–96.

	Military Spending	
	(1)	(2)
Lagged Military Spending	0.387	0.440
	(0.251, 0.524)	(0.300, 0.581)
Lag Alliance Commitments	9.670	
	(6.796, 12.544)	
Lag Log Alliance Commitments		273.668
		(180.698, 366.639)
Lag Change in GDP	−0.060	−0.024
	(−0.128, 0.008)	(−0.094, 0.045)
Lag Major Rival Spending	0.027	0.076
	(−0.075, 0.129)	(−0.025, 0.176)
Cold War	25.708	−33.299
	(−49.418, 100.834)	(−101.715, 35.116)
Post-Conflict Years	−9.381	−13.377
	(−36.015, 17.252)	(−41.204, 14.450)
Log Combat Fatalities	8.938	9.384
	(5.018, 12.857)	(5.269, 13.499)
Lag Republican President	19.215	22.925
	(−4.582, 43.013)	(−1.932, 47.781)
Lag Budget Deficit	−0.418	−1.651
	(−7.266, 6.429)	(−8.842, 5.539)
Constant	−202.501	−802.537
	(−351.566, −53.435)	(−1,165.185, −439.888)
N	73	73

95% Confidence Intervals in Parentheses.

Table 1: Coefficient Estimates from an autoregressive distributed lag regression model of U.S. alliance commitments and military spending from 1947 to 2019.

commitments and U.S. spending, not just whether the p-values are below a certain threshold.

The alliance commitments coefficient captures the effect of adding one new security guarantee on the next year's defense budget. Based on Model 1, adding one additional commitment increases U.S. defense spending the next year by \$9.8 billion. The 95 percent confidence interval indicates that the short-run effect could range between \$6.8 and \$12.5 billion. Independent variables have a less intuitive interpretation when they are log-transformed, but Model 2 similarly yields a potentially large substantive effect. A 10 percent increase in the logged changes in alliance commitments leads to about \$29 billion more in defense spending the next year, with a 95 percent confidence interval ranging from \$22.3 billion to \$35.6 billion.

Much of the cost (or savings) associated with alliances might not materialize just one year later. Because changes in military spending accumulate over time, the impact of a new alliance commitment is spread out over multiple years. The United States and Taiwan forged a formal defense pact in 1954, for instance, but U.S. troop levels on the island did not peak until four years later.[90] The long-run costs of an alliance, then, give a more complete sense of their financial toll than the regression coefficients alone. We use the long-run multiplier of alliance commitments to capture the *total* effect of a one unit increase in the lagged number of alliance commitments on defense spending. To calculate the long-run multiplier, we divide the lagged alliance commitments coefficient by the lagged level of military spending coefficient and calculate standard errors with the delta method.[91]

The long-run multiplier of a new alliance commitment is positive and large: one additional alliance commitment ultimately adds between \$11 and \$21 billion to the defense budget, on average, according to Model 1. Put differently, the annual level of the defense budget is \$11 to \$21 billion greater once the impact of making a new alliance commitment is fully realized. This estimated range is a 95% confidence interval based on a point estimate of 15.8 and a standard error of 2.6.

90. Kane, *Global U.S. Troop Deployment, 1950–2003*.

91. Formally, this is equal to $\frac{\text{Lagged Alliance Commitments Coefficient}}{(1-\text{Lagged Spending Levels Coefficient})}$. This long-run multiplier is the basis of the long-run multiplier test we used to assess the presence of a long-run relationship.

Based on the estimates from Model 2, a 10 percent increase in logged alliance commitments adds $51 billion in spending over the long-run, with a 95 percent confidence interval that spans from $36 billion to $68 billion.

To further illustrate our results, we assess the substantive impact of a well-known change in U.S. alliance commitments: NATO expansion after the Cold War. This part of the analysis answers recent calls for further scrutiny of NATO expansion, which was an extremely consequential policy decision.[92] We focus on the admission of the three Baltic States in 2003-04. Offering NATO membership to Estonia, Latvia, and Lithuania was unique and controversial because they were formerly part of the Soviet Union. What was the budgetary impact of making formal defense commitments to three former Soviet states?

To find out, we carried out a counterfactual analysis. First, we simulated a set of coefficient estimates using the results from the regression model.[93] We then used the model estimates to make predictions in two scenarios: one with the observed NATO expansion into the Baltic States and the other in a hypothetical scenario where NATO did not expand. In the latter analysis, we remove the three Baltic alliance commitments and hold all other factors constant except the lagged level of spending. This means that the counterfactual data contains three fewer U.S. alliance commitments relative to the observed number of alliances after 2004. The counterfactual analysis predicts spending in each year, then uses the predicted values as the lagged spending value in the next period, which allows us to fully express the impact of the hypothetical change in alliances.[94] The difference in spending between these two scenarios provides an estimate for the budgetary cost of NATO expansion.

92. James Goldgeier and Joshua R. Itzkowitz Shifrinson, "Evaluating NATO enlargement: scholarly debates, poli-cyimplications, and roads not taken," *International Politics* 57, no. 3 (2020): 291–321.

93. The simulation uses the central limit theorem to simulate a distribution of coefficients from the model estimates, then multiplies the simulated parameter vectors by two datasets – one with the observed data and the other with hypothetical data.

94. Because annual predictions in the counterfactual are based on simulated lagged spending values after 2004, there is more uncertainty in the counterfactual estimates than the observed data, which draw on a single lagged spending value instead of multiple simulated values.

Figure 2 plots the results. The bottom panel shows 95% confidence intervals for predicted changes in U.S. military spending, with the observed case depicted in black and the hypothetical non-expansion scenario shown in gray. The top panel shows the 95% confidence interval for the difference between the predictions with the observed data and predictions with the counterfactual data. The figure makes clear that NATO expansion into the Baltic states consistently led to higher military spending. By 2019, the estimated difference between the observed and counterfactual scenarios is between $13 and $46 billion. These costs reflect substantial investments in infrastructure and increased NATO membership expenses.[95] Further expenditures support allied training, procurement and more recently, the European Deterrence Initiative.[96] NATO expansion is also associated with a perceptible difference in U.S. military spending when we log-transform the alliance commitments variable, but the estimated effects are more uncertain. As shown in the online appendix, the estimated difference between adding the Baltic states and keeping them out of NATO is between $1 and $40 billion by 2019, all else equal.

In sum, we find that taking on more alliance commitments is associated with increased military spending, all else equal. Adding a single alliance commitment to the U.S. portfolio adds billions of dollars to the defense budget, on average, in the long run. These conclusions do not depend on assumptions about the marginal cost of alliances, as inferences with logged alliance commitments are very similar. These results are consistent with the budget hawk view that alliance participation increases U.S. military spending, and contradict the bargain hunter perspective. However, before reaching more definitive conclusions, it is important to assess the robustness of our findings. We take up this task in the next section.

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95. Sara Bjerg Moller, "Twenty years after: assessing the consequences of enlargement for the NATO military alliance," *International Politics* 57 (2020): 509–529, ISSN: 1384-5748, doi:10.1057/s41311-020-00230-y.

96. Derek E. Mix, *Estonia, Latvia, and Lithuania: Background and U.S.-Baltic Relations*, technical report R46139 (Congressional Research Service, 2020), https://fas.org/sgp/crs/row/R46139.pdf.
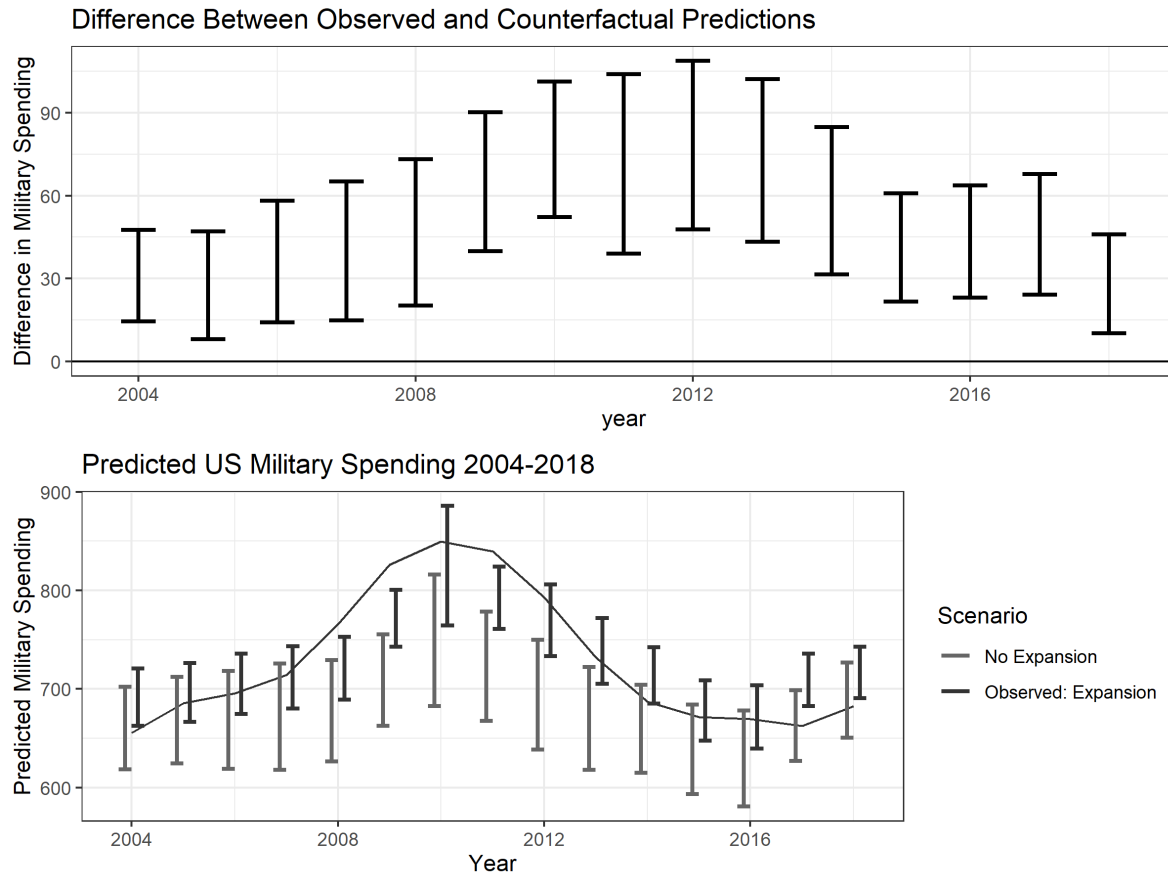
Figure 2: Estimated U.S. military spending with and without NATO expansion to Estonia, Latvia and Lithuania. The bottom panel shows predictions from two circumstances: (1) observed NATO expansion and (2) a counterfactual scenario where NATO did not add the three Baltic countries in 2004. The top panel plots the estimated annual difference between predictions from the observed data. The error bars summarize the 95% confidence interval for the predicted values and differences. Estimates on the scale of billions of dollars.

Robustness Checks

Our findings could be driven by unusual and influential observations, especially since our sample is relatively small. U.S. military spending and alliances both increase dramatically between 1949 and 1951, as the Korean War drove large spending increases and the United States formed some key Cold War alliances. There is another sharp increase in both defense expenditures and alliance commitments shortly after the 9/11 attacks. We assess whether these periods or other transient shifts in the international context drive our results in three ways.

First, we estimate models in a different samples, including one that starts in 1954 instead of of 1947 and another that starts in 1920.[97] Starting in 1954 eliminates any impact of data from the unusual immediate postwar period on our estimates. Second, we add two dummy variables – one for all years before 1953 and another for the period after 9/11 – to control for these unique periods. Third, we include presidential fixed effects in our model. Administration-specific binary variables control for unobserved confounding factors that may be specific to presidential administrations. This accounts for unusual administration-specific changes, such as the Reagan defense buildup and the global war on terror, as well as changes in U.S. foreign policy priorities.[98]

Figure 3 summarizes how these changes alter our initial results. The figure reports the estimated long-run multipliers of a one-unit increase in U.S. alliance commitments for each model. These estimates suggest that our substantive conclusions about the relationship between alliances and military spending are relatively unaffected by unusual periods of alliances and defense spending after World War II. There are slight differences in the estimates across the different specifications, largely because of our small sample size, but the substantive inferences are broadly similar. Most models find a more uncertain long-run effect than our original model ($11 to $21 billion), but there is little appreciable difference in the estimates. The biggest estimated effect emerges from

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97. The latter results, which include a pre-World War II period when the United States did not provide any security guarantees, appear in the online appendix.

98. In the models with president-specific binary variables, we drop the Cold War and Republican president control variables, as these indicators are perfectly correlated with some presidential fixed effects.
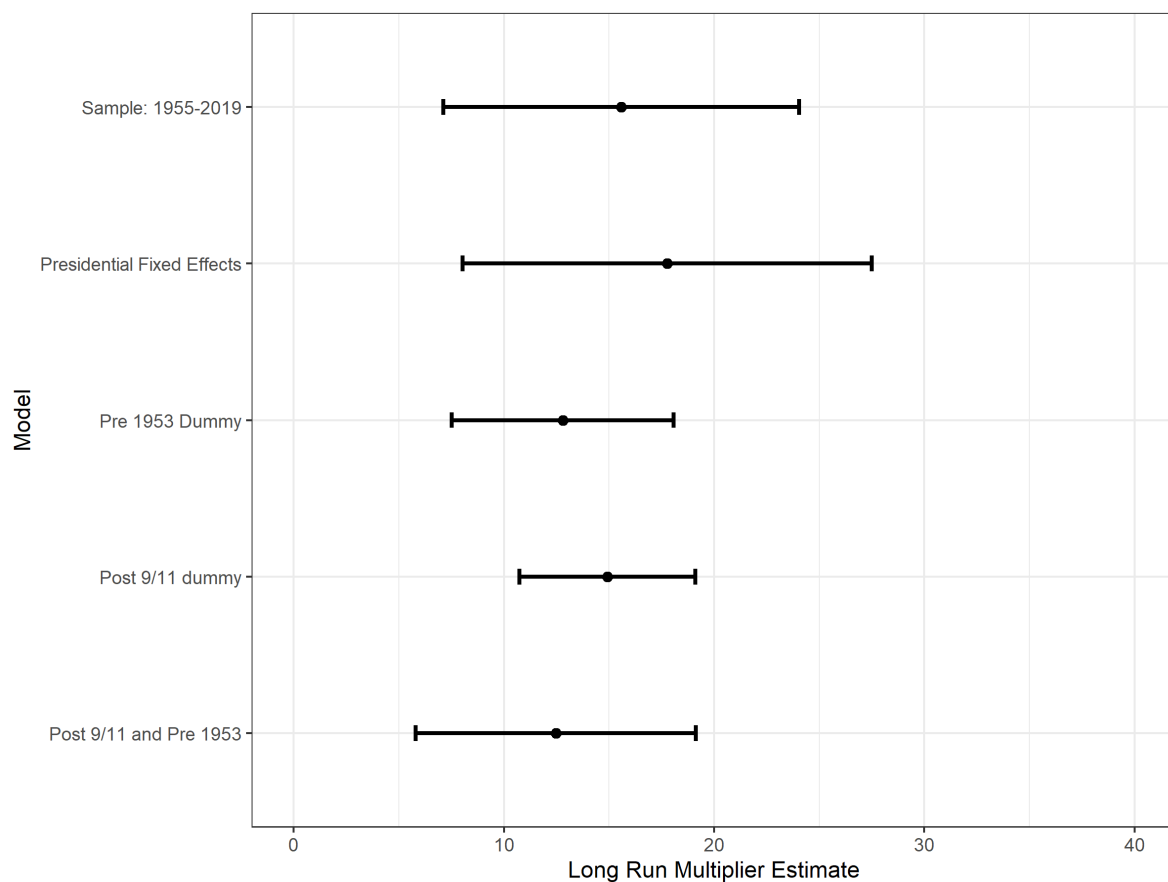
Figure 3: Estimated long-run multiplier of a one-unit increase in U.S. alliance commitments across different samples and model specifications. The y-axis contains information about how the model or sample deviates from our baseline regression model. Points mark the expected value, while the error bars summarize the 95% confidence interval. Estimates on the scale of billions of dollars.

the model that adds presidential fixed effects to our baseline specification. This model suggests that the long-run impact of adding an alliance is about $18 billion, compared to $16 billion in our main analysis. Adding presidential fixed effects increases uncertainty in the long-run multiplier, as this model has twelve fewer degrees of freedom. Our results cannot be explained, therefore, by changes in foreign policy or grand strategy among different presidents.

We present the results from further robustness checks in an online appendix. First, we conduct an extreme bounds analysis that involves re-running our model 12,911 times with different combinations of independent variables. This analysis allows us to determine whether our results are sensitive to the model specification we chose. Second, we estimate error correction models as an alternative way to specify dynamic regression models. Third, we estimate static models with alliances and military spending in first differences. Fourth, we use an alternative lag structure in the ADL model, and find a slightly smaller substantive effect of $6 to 15 billion per alliance when we include two lags of defense spending. Last, we analyze data from 1920 on to capture the impact of alliances starting with no commitments. All of these checks come to the same substantive conclusion: alliance participation is associated with greater U.S. military spending.

Discussion and Conclusion

Military alliances figure prominently in debates about U.S. grand strategy and foreign policy. This article investigated the financial cost of U.S. alliance commitments. We summarized two schools of thought that offer contradictory answers: the budget hawk school and the bargain hunter perspective. The former suggests that alliances generate large increases in defense expenditures, while the latter claims that security guarantees are relatively cheap and may even save the United States money in the long run. To assess these competing predictions, we designed a statistical model to estimate how changes in the number of alliance commitments over time affect U.S. defense expenditures while controlling for confounding factors, such as the president's political party

and economic growth. Our approach accounts for the financial costs and benefits of U.S. security guarantees, including things that are difficult to measure directly, such as savings from extended deterrence and spending to compensate for "free-riding" by allies.

We found that increasing the number of U.S. alliance commitments is associated with greater defense expenditures. In the long-run, on average, one additional alliance commitment adds between $11 and $21 billion to the level of the defense budget. Our models identify the general trend – an important first step – but cannot tell us the true budgetary burden of any single alliance. Some alliance commitments may exceed the $11 and $21 billion range, while others are almost certainly below it. Our analysis showed, for example, that post-Cold War NATO expansion into the Baltic States added between $16 and $45 billion to the defense budget, an average of between $5.33 and $15 billion per country. Other U.S. alliances, such as the one with Haiti, are undoubtedly even cheaper.

A series of follow-on analyses showed that changing our research design in various ways can increase or decrease the range of our initial estimate. In each case, however, the results reaffirmed that increases in alliance commitments are correlated with large long-run growth in the defense budget. The increase in defense spending resulting from an additional alliance commitment is smallest ($6 to $15 billion) when we include two lags of defense spending in our model rather than one.

The United States obviously does not form alliances at random. It is therefore possible that the factors giving rise to security guarantees – rather than the commitments per se – account for our results. We addressed this by controlling for factors that affect defense spending and alliance formation and are possible to measure, like expenditures by major power rivals and presidential partisanship. To account for unobservable confounders that do not change over time within the same administration, we estimated models with presidential fixed effects. This further reduces the risk of omitted variable bias, but these results could still be off the mark if there are one or more unaccounted for factors that change over time within the same administration and also cause

both alliance formation and military spending. Although we cannot be certain that our findings reflect a causal relationship, at the very least, there is a strong positive association between alliance commitments and U.S. defense expenditures.

The fixed effects analysis is helpful for evaluating a key claim made by some scholars in the bargain hunter school: that U.S. defense spending on power projection capabilities and overseas deployments reflects grand strategy rather than alliance commitments specifically. Rapp-Hooper argues, for example, that "America's spending reflects the country's far-flung global strategy, not its alliance commitments per se."[99] If that were true, we would not expect to see differences in defense spending following changes in alliance commitments *within the same administration*. That is because grand strategy, as well as beliefs about military spending and foreign policy more generally, are relatively stable within administrations. However, we find that the same presidential administration increases spending after extending security guarantees to additional countries. This suggests that alliances themselves – not just U.S. grand strategy – are responsible for at least some U.S. defense spending for overseas endeavors.

Overall, our findings are consistent with the budget hawk claim that alliance commitments require the United States to shoulder a significant financial burden. They contradict the bargain hunter argument that the savings generated by alliances offset whatever expenses they require, leading to a net-neutral effect on the defense budget. Alliances may result in some efficiency gains, but their financial toll swamps any such savings for the United States.

The size of the budgetary burden stemming from alliances reflects – and may exceed – the expectations of the budget hawk school. Posen's estimate indicates that the United States could save about $100 billion annually by being "more judicious in its promises abroad."[100] Based on our analysis, U.S. alliance commitments may be responsible for a greater share of the defense budget than this estimate implies. We find that just one additional alliance commitment is associated

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99. Rapp-Hooper, *Shields of the Republic: The Triumph and Peril of America's Alliances*, 100.
100. Posen, "The High Costs and Limited Benefits of America's Alliances."

with an annual increase to the defense budget between one-tenth and one-fifth of the $100 billion estimate.

Our findings stand in stark contrast to other research on military alliances and defense spending. Scholars usually assess this relationship by analyzing the behavior of a large number of countries over time. Many prior studies that take this approach conclude that alliances *reduce* expenditures.[101] Matthew Digiuseppe and Paul Poast, for example, find that forming at least one alliance with a democracy decreases military expenditures by as much as 17.6 percent in the short-run, on average, compared to having zero alliances with democratic states.[102] Our analysis shows that the United States deviates from this general trend. Unlike other countries, the United States spends billions of dollars more on defense with each additional alliance commitment it makes. That other countries reduce their expenditures after forming alliances may be partially why the United States needs to increase its own.

With this more complete estimate of the financial cost of security commitments for the United States, analysts and policymakers can better assess the degree to which military alliances serve U.S. interests. Our analysis supports a central pillar of restraint in U.S. foreign policy while weakening the claim made by the deep engagement school that alliances are relatively inexpensive.

This does not necessarily imply that forming and maintaining alliances is a bad idea, however. We can neither refute nor confirm restrainers' claim that alliances are *too* expensive. To know whether U.S. investments in military alliances are worthwhile, we need to incorporate the benefits the United States obtains from being part of them and weigh those benefits against these and other costs.

Our study is not designed to evaluate the benefits of alliance commitments for the United States. However, prior research suggests that providing security guarantees enhances U.S. interests in several ways. Alliances make the U.S. military more effective by facilitating power projection

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101. For a study that reaches a different conclusion, see T Clifton Morgan and Glenn Palmer, "To Protect and to Serve: Alliances and Foreign Policy Portfolios," *Journal of Conflict Resolution* 47, no. 2 (2003): 180–203.
102. DiGiuseppe and Poast, "Arms versus Democratic Allies."

and augmenting the capabilities it can bring to bear during crises and military conflicts.[103] Formal security guarantees also promote global international peace and stability by enhancing extended deterrence.[104] In addition, alliances help limit the international spread of nuclear weapons, which is a major threat to U.S. national security.[105] Having alliance partners may also enhance U.S. political and diplomatic influence, while simultaneously weakening adversaries' sway.[106] On the economic front, alliances facilitate trade and attract foreign direct investment.[107]

The next step in this research program is to evaluate whether the benefits are sufficient to justify an average price tag of $11-21 billion per alliance. The deep engagement camp often claims that the benefits of U.S. alliances are large and the costs are small. This makes the ultimate conclusion clear: alliances provide a net benefit to the United States. However, because our study indicates that alliances are more expensive than the deep engagement camp acknowledges, it is less obvious that the return on investment is unambiguously positive. Given the many benefits that result from alliances, there very well might be a net positive effect for the United States. Increased trade and investment, combined with the political and diplomatic benefits of alliances, could offset the burden on the U.S. defense budget. In order to have a clearer answer, however, we need further net assessments that account for the higher budgetary burden imposed by alliances.

Our conclusions are subject to three additional caveats. First, our model cannot reliably estimate how sudden and drastic changes in the U.S. alliance portfolio would affect defense expen-

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103. Brands and Feaver, "What Are America's Alliances Good for?," 22-25.

104. Leeds, "Do Alliances Deter Aggression? The Influence of Military Alliances on the Initiation of Militarized Interstate Disputes"; Jesse C. Johnson and Brett Ashley Leeds, "Defense Pacts: A Prescription for Peace?," *Foreign Policy Analysis* 7, no. 1 (2011): 45–65; Fuhrmann and Sechser, "Signaling Alliance Commitments: Hand-Tying and Sunk Costs in Extended Nuclear Deterrence."

105. Philipp C. Bleek and Eric B. Lorber, "Security Guarantees and Allied Nuclear Proliferation," *Journal of Conflict Resolution* 58, no. 3 (2014): 429–454; Dan Reiter, "Security Commitments and Nuclear Proliferation*," *Foreign Policy Analysis* 10, no. 1 (2014): 61–80.

106. James D Morrow, "Alliances and Asymmetry: An Alternative to the Capability Aggregation Model of Alliances," *American Journal of Political Science* 35, no. 4 (1991): 904–933.

107. Joanne Gowa and Edward D. Mansfield, "Power Politics and International Trade," *American Political Science Review* 87, no. 2 (1993): 408–420; Quan Li and Tatiana Vashchilko, "Dyadic Military Conflict, Security Alliances, and Bilateral FDI Flows," *Journal of International Business Studies* 41 (2010): 765–782; Rapp-Hooper, *Shields of the Republic: The Triumph and Peril of America's Alliances*.

ditures, as these scenarios extrapolate far beyond our observed data. The greatest number of new commitments the United States took on in a single year from 1947 to 2019 was eleven, and the largest annual decrease in alliance commitments is one. We do not know how shifts larger than these in one year would influence U.S. military spending because we never observed such a scenario. Changes larger than anything we observed might generate different and unexpected effects. Although we might want to know what would happen to the budget if the United States eliminated *all* of its alliance commitments next year, our model cannot estimate this effect.

Second, there are only four years in which we observe a reduction in the number of countries with U.S. protection. Our results are therefore based mostly on what happens after the United States takes on new commitments. Much of the policy debate today is about eliminating or curtailing existing alliance promises – not taking on new ones. Our calculations can speak to this debate if we assume that forming new alliances and eliminating old ones are two sides of the same coin. However, if voiding an alliance has different implications for the U.S. defense budget than not forming one in the first place, our model would have less utility for the contemporary debate. To illustrate, some have argued that withdrawing from alliances would embolden U.S. adversaries and ultimately necessitate a large arms buildup to make up for lost ground.[108] If this claim is true, and if adversaries would *not* have been more assertive had the United States refrained from forming an alliance at the outset, our analysis overestimates the savings the United States would get by eliminating alliance commitments.

Third, the factors that made alliances expensive for the United States over the last 70 years could change in the future. The United States expended considerable resources on policy coordination, military equipment, troops, overseas bases, and military exercises to deter adversaries and reassure allies. Moving forward, improvements in the international security environment or changing beliefs among U.S. officials about how to make an effective alliance could reduce the direct costs of security guarantees. Washington could also save money in the future if allies make

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108. Colby and Thomas, "The Future of Alliance."

larger contributions towards common goals. This underscores an important reality: It is not alliance treaties per se that generate costs but rather what the United States does to secure and support them.[109] U.S. officials who are concerned about the cost of security guarantees could make them more efficient rather than eliminate alliances altogether.

Data Availability Statement: The data and materials that support the findings of this study are available in the Harvard Dataverse at `https://doi.org/10.7910/DVN/T384KW`.

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109. Rapp-Hooper, *Shields of the Republic: The Triumph and Peril of America's Alliances*, 84-85.