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PUTTING IT ALL TOGETHER

THE 2025 DEFENSE BUDGET REQUEST, ALTERNATIVE BUDGET PROPOSALS, AND NATO SPENDING

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ABOUT THE AUTHOR

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Cover Graphic: German soldiers prepare the Patriot surface-to-air missile system in Capu Midia Training Range, Romania, on June 13, 2024. Photo courtesy of NATO.

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One issue driving the current U.S. defense budget debate is NATO military spending, a highly contested topic in American discourse. Much attention has centered on NATO members devoting at least 2 percent of their gross domestic product (GDP) to defense. Despite this attention, research has rarely explored what meeting different spending targets would mean.

This report estimates how much extra defense spending, specifically for equipment, would be created if NATO countries reached different spending targets by 2029. It then illustrates military capabilities that NATO countries could acquire with the additional equipment expenditure. Finally, it identifies three options for reaching equipment spending levels commensurate with the 2 percent of GDP target.

To realize the report's NATO spending scenarios, U.S. defense spending would have to grow in real terms by 1.8 percent per year, on average, to keep up with GDP growth. Achieving that defense growth rate is not guaranteed given the current American political situation. However, average growth in recent years has exceeded 1.8 percent, so reaching that level appears achievable.

Two Percent of GDP Remains a Meaningful Goal for NATO

All NATO countries reaching 2 percent of GDP would increase collective spending by $156 billion over five years relative to continuing the status quo, with $36 billion of that total going to equipment. Adding $156 billion over five years would be the equivalent of adding two Swedens or four Finlands. Expending $36 billion more on equipment would support acquiring thousands of munitions, dozens of aircraft, and flotillas of ships. Meanwhile, reaching 3 percent of GDP, a target suggested by President Trump, would increase spending by $932 billion over five years, yielding $260 billion more for equipment.[1] That equipment expenditure would be enough to raise these illustrative acquisitions tenfold.

Experts may deride GDP targets as a crude instrument.[2] They may believe that NATO achieving full compliance with 2 percent is relatively inconsequential because many countries have recently met that goal. Six countries met the 2 percent of GDP target in 2021, and NATO estimates 23 will meet the target in 2024.

Reaching 2 percent would generate new resources that, if invested wisely, would improve NATO's deterrence and defense against Russia. The 2 percent target therefore remains a meaningful goal, in terms of the resources it would create, despite the recent surge in countries meeting that target.

Shift, Substitute, or Siphon: Options to Reach Equipment Spending Commensurate with 2 Percent of GDP

Although the resources associated with reaching 2 percent of GDP are militarily significant, the 2 percent target is not the only way to generate them. The report identifies three ways NATO could reach equipment spending levels commensurate with 2 percent. NATO could *shift* by increasing its equipment spending target from 20 percent to 30 percent. It could *substitute* by pushing the countries noncompliant with 2 percent of GDP to reach 1.8 percent by 2029, with the United States making up the difference. Finally, it could *siphon* by redirecting a portion of the funds currently going to Ukraine into strengthening NATO if the Ukraine war subsides.

1 Theresa Hitchens, "Trump Promises to Create Space National Guard, Demands More NATO Spending," *Breaking Defense*, August 26, 2024, https://breakingdefense.com/2024/08/trump-promises-to-create-space-national-guard-demands-more-nato-spending/.

2 Simon Lunn and Nicholas Williams, *NATO Defence Spending: The Irrationality of 2%* (London: European Leadership Network, June 2017), https://www.europeanleadershipnetwork.org/wp-content/uploads/2017/10/170608-ELN-Issues-Brief-Defence-Spending.pdf.

Two Lessons for Future Policy and Research

The report demonstrates the power of focusing on middle-range metrics (equipment spending, in this case) when examining NATO military expenditure. Good middle-range metrics will lie between GDP percentage, which is too crude, and various soft-power indicators proposed by scholars of burden sharing, which are too far removed from military considerations. The best metrics will indicate future fighting potential, which is what GDP percentage presumes to predict but does quite badly. This report uses equipment spending in this predictive fashion. Research by John Deni and others has used NATO troop contributions to similarly good effect.[3] Future research can identify other useful middle-range metrics.

The report also showcases how NATO might use finesse to accomplish outcomes on par with the 2 percent of GDP target. For example, emphasizing equipment spending might help NATO sidestep mired politics because equipment targets feature slightly different groups of noncomplying countries than GDP targets. Additionally, investing in military capabilities that offer fungibility across geography and missions might help NATO win support from broader political coalitions. The debate over NATO's 2 percent target sometimes seems trapped in an endless rhetorical loop. The report proposes ways creative planners can break that pattern.

3 John R. Deni, *We Don't Really Know Which NATO Allies Are Pulling Their Weight. Here's How to Fix That* (Washington, DC: Atlantic Council, July 2023), https://www.atlanticcouncil.org/in-depth-research-reports/issue-brief/natos-next-burden-sharing-agreement/.

CHAPTER 1

The FY 2025 Request, Alternative Budget Proposals, and NATO Spending

The fiscal year (FY) 2025 defense budget request cuts 1.4 percent, in real terms, from the previous year's enacted base budget to comply with spending caps contained in the Fiscal Responsibility Act of 2023 (FRA-23). If history is any guide, the next year or two—with a new administration and new Congress entering office—would be the most likely time for a sizable change in defense spending.

Experts from across the political spectrum have introduced competing proposals for future budgets. The most noteworthy aspect of these proposals is the extraordinary degree to which they differ. This situation is puzzling given the coalescing concern among American elites and citizens about the Chinese threat.

One issue driving differences of opinion about U.S. defense budgets is NATO spending. Much attention has centered on whether NATO members are devoting at least 2 percent of GDP to defense. Despite this attention, research has rarely explored what meeting different spending targets would mean for NATO. The next chapter analyzes that topic, connecting competing U.S. budget proposals to larger alliance considerations.

FY25 Request Suppressed by Fiscal Responsibility Act

To comply with FRA-23's spending caps, the FY 2025 Department of Defense (DoD) base budget request would cut 1.4 percent, in real terms, from the FY 2024 budget enacted by

Congress (Table 1).[4] By reducing DoD's base budget to meet the FRA-23 limits, the FY 2025 request flouts the upward drift in defense expenditure prevailing since 2016 (Figure 1).

TABLE 1: DISCRETIONARY BUDGET AUTHORITY IN THE PRESIDENT'S BUDGET REQUEST (CURRENT DOLLAR BILLIONS), FY24 TO FY29

Totals may not add due to rounding	FY24 enacted	**FY25 requested**	FY26 projected	FY27 projected	FY28 projected	FY29 projected
DoD funding (excl. supplemental)	**843.0**	**849.8**	876.8	895.1	913.5	932.6
DoD base budget request	842.0	849.8	876.8	895.1	913.5	932.6
Congressional additions to base budget	1.0	-	-	-	-	-
DoD funding (incl. supplemental)	**910.3**	**849.8**	876.8	895.1	913.5	932.6
Supplemental funding (Ukraine, Israel, Indo-Pacific)	67.3	-	-	-	-	-
National defense funding (excl. supplemental)	886.3	895.2	924.2	943.6	963.1	983.3
DoD base budget (incl. congressional additions)	843.0	849.8	876.8	895.1	913.5	932.6
Atomic energy defense activities	33.2	34.0	35.3	36.3	37.0	37.7
Defense-related activities	10.1	11.4	12.1	12.2	12.6	13.0
National defense funding (incl supplemental)	953.6	895.2	924.2	943.6	963.1	983.3
Supplemental funding (Ukraine, Israel, Indo-Pacific)	67.3	-	-	-	-	-
Nominal growth DoD funding (excl. supp)	3.3%	0.8%	3.2%	2.1%	2.1%	2.1%
Nominal growth DoD funding (incl. supp)	6.9%	-6.6%	3.2%	2.1%	2.1%	2.1%
Real growth DoD funding (excl. supp) (FY25 GDP price index)	0.6%	**-1.4%**	1.1%	0.0%	0.0%	0.0%
Real growth DoD funding (incl. supp) (FY25 GDP price index)	4.1%	**-8.7%**	1.1%	0.0%	0.0%	0.0%

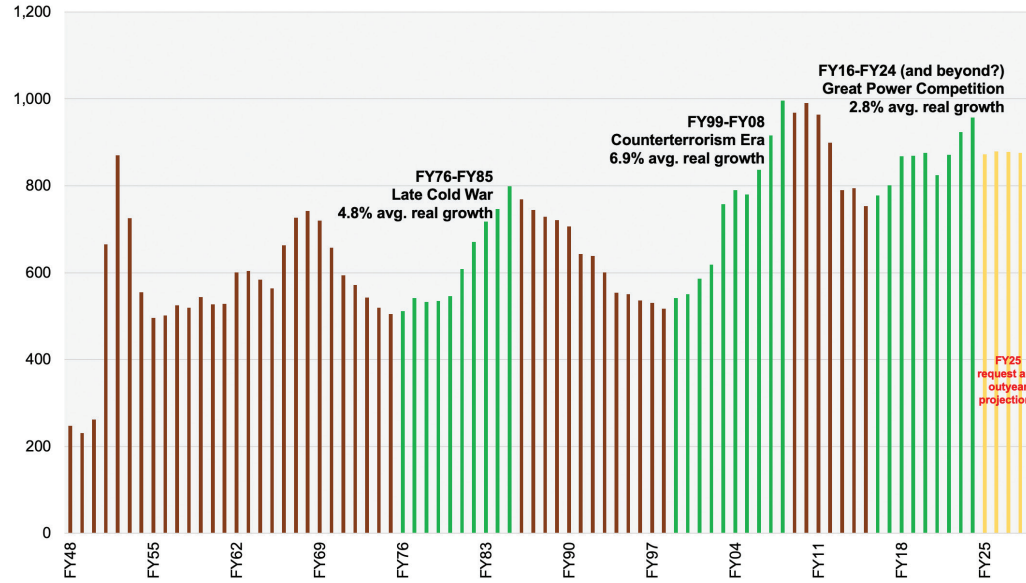
Sources: DoD, Office of Management and Budget (OMB), and Congressional Budget Office (CBO).[5]

Notes: In billions nominal $.

4 Department of Defense (DoD), "FY 2025 Press Release: Defense Budget," March 11, 2024, https://www.defense.gov/News/Releases/Release/Article/3703410/department-of-defense-releases-the-presidents-fiscal-year-2025-defense-budget/.

5 DoD, *National Defense Budget Estimates for FY 2025*, April 2024, Table 1-2, 7–8, https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2025/fy25_Green_Book.pdf; DoD, *Defense Budget Overview*, April 4, 2024, A-6 to A-7, https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2025/FY2025_Budget_Request_Overview_Book.pdf; Office of Management and Budget (OMB), *FY 2025 Historical Tables,* Table 10.1, Gross Domestic Product and Deflators Used in the Historical Tables: 1940–2029, March 2024, https://www.whitehouse.gov/wp-content/uploads/2024/03/hist10z1_fy2025.xlsx; and Congressional Budget Office (CBO), *Status of Discretionary Appropriations Report: Fiscal Year 2024, U.S. Senate*, May 21, 2024, 2, https://www.cbo.gov/system/files/2024-05/FY2024-Senate-2024-04-23.pdf.

FIGURE 1: DOD TOPLINE (CONSTANT FY25$ BILLIONS), FY48 TO FY29, INCL. SUPPLEMENTALS



Sources: DoD, CBO.[6]

Notes: In billions FY25$ discretionary and mandatory budget authority including supplementals. FY25–FY29 figures exclude any supplementals that may be requested for those years. FY24 figure reflects mandatory spending amount requested by DoD.

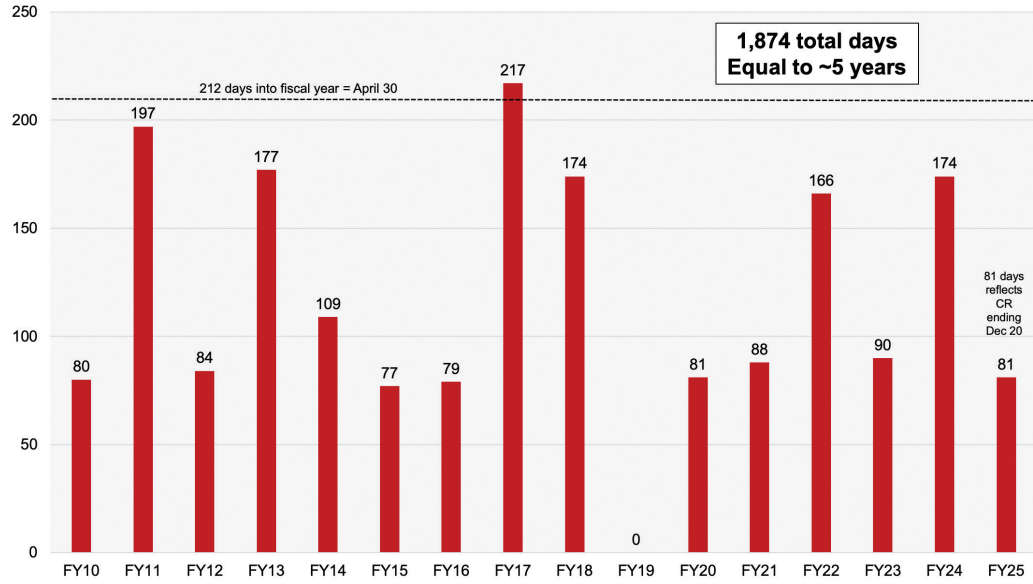
In FY 2025, DoD again faces the threat of across-the-board automatic cuts, known as a sequester, if Congress delays passing regular appropriations, a depressingly routine occurrence on Capitol Hill (Figure 2).[7] If a temporary continuing resolution (CR) remains in effect on January 1, 2025, because Congress has not enacted full-year appropriations, then FRA-23 would automatically lower the national defense (050) cap from $895.2 billion to $849.8 billion. If Congress passed full-year appropriations after January 1 but before April 30, then the cap would revert to the original higher level.

However, if a CR were still in effect on April 30, 212 days into the fiscal year, then a sequester order would be issued to adjust spending to $849.8 billion for national defense. Under sequestration, spending reductions would be applied as a uniform percentage across all DoD accounts, though the president could exempt or limit the reductions to military personnel accounts to protect service members' pay and benefits.

6 DoD, *National Defense Budget Estimates for FY 2025*, Table 6-8; CBO, *Status of Discretionary Appropriations Report*, 2; and DoD, *National Defense Budget Estimates for FY 2024*, May 2023, Table 1-1, https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY24_Green_Book.pdf.

7 This paragraph is adapted from Travis Sharp, *Inconsistent Congress: Analysis of the 2024 Defense Budget Request* (Washington, DC: CSBA, October 2023), 4, https://csbaonline.org/research/publications/inconsistent-congress-analysis-of-the-2024-defense-budget-request.

FIGURE 2: DAYS SPENT UNDER CONTINUING RESOLUTIONS AT DOD, FY10 TO FY25



Source: DoD.[8]

Congress finished its FY 2024 appropriations work roughly one month ahead of the April 30 sequester deadline after plodding through continuing resolutions for the first six months of the fiscal year. FRA-23's sequester provision thus has not resulted in more timely appropriations, as some had hoped.[9] Instead, it has permitted months to pass under harmful continuing resolutions before the looming sequester threat finally forces congressional action.[10]

Options for 2025 and Beyond: Competing Proposals for DoD Budgets

With a new president and new Congress entering office, and FRA-23's binding caps expiring after FY 2025, the coming years present an opportunity to alter the defense budget's trajectory. CSBA research has shown that budgets change most dramatically during the early years of new administrations, with spending regressing to the mean in later years.[11] This

8 DoD, "FY 2025 Budget Briefing," March 2024, 3, https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2025/FY2025_Budget_Request.pdf.

9 Jim Tankersley and Alan Rappeport, "New Details in Debt Limit Deal: Where $136 Billion in Cuts Will Come From," *New York Times*, May 29, 2023, https://www.nytimes.com/2023/05/29/us/politics/debt-ceiling-agreement.html.

10 On the harmful effects of an extended continuing resolution, see Lloyd Austin, letter to Tom Cole, September 7, 2024, https://defensecommunities.org/wp-content/uploads/2024/09/SD-CR-Letter_Cole-FINAL.pdf.

11 Travis Sharp, "Wars, Presidents, and Punctuated Equilibriums in U.S. Defense Spending," *Policy Sciences* 52, no. 3, September 2019, 367–396; and Travis Sharp, *Slow and Steady: Analysis of the 2022 Defense Budget Request* (Washington, DC: CSBA, July 2021), 9–13, https://csbaonline.org/research/publications/slow-and-steady-analysis-of-the-2022-defense-budget-request.

pattern recurs because newly empowered policymakers devote a lot of attention to military spending at an administration's outset, but their political power and freedom to maneuver wane as years pass. Given these dynamics, any policymaker hoping to reorient spending should act early in 2025.

The Pentagon's current plan provides a natural starting point for considering future options. As shown in Table 1, the FY 2025 request projects returning to real growth (1.1 percent) in FY 2026, when FRA-23's binding caps will have expired, and then keeping pace with inflation (0.0 percent) through FY 2029. However, senior Biden administration officials have implied that this plan provides too little funding. For example, in March 2024, Deputy Defense Secretary Kathleen Hicks stated, "We must grow the defense budget in the out years of our future years' defense program if we want to achieve the goals of the National Defense Strategy, especially in the face of rapid modernization by [China]."[12] Because the FY 2025 request forecasts outyear spending increasing at the inflation rate, it technically satisfies Hicks's stated need to "grow." In the context of her broader public messaging, however, she almost surely meant that executing the strategy would require at least some real growth in the base budget, mirroring what DoD received in recent years.[13]

With senior DoD leaders signaling dissatisfaction with the current plan, the door is wide open for alternative approaches. Figures 3 and 4 present eight alternative base budget proposals for the FY 2025–2029 period. Seven proposals originate from governmental or nongovernmental actors spanning the political spectrum from Representatives Barbara Lee and Mark Pocan, the progressive Democratic cochairs of the Defense Spending Reduction Caucus, to Senator Roger Wicker, the Reaganite conservative and ranking Republican on the Senate Armed Services Committee. Also included are iconoclastic proposals that defy traditional party molds, including those from libertarian Senator Rand Paul and former Trump administration OMB director Russ Vought's Center for Renewing America. The eighth proposal, the average growth rate of Biden administration budget requests (1 percent real growth, FY 2022–2024), was added by CSBA.[14] The proposal depicts what would happen if the Biden administration's pre-FRA-23 decision-making pattern continued. Figures 3 and 4

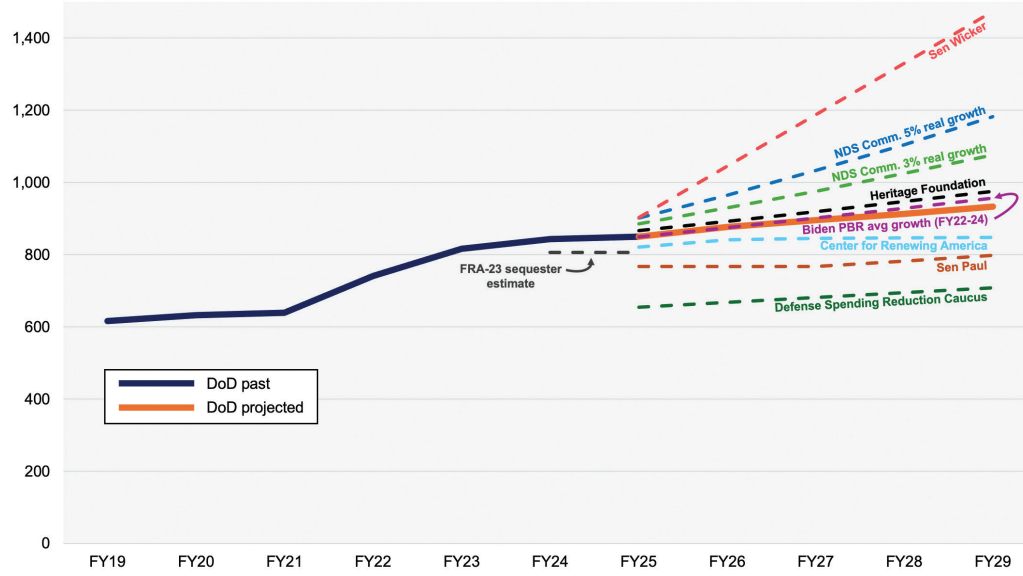
12 DoD, press briefing by Kathleen H. Hicks and Christopher W. Grady, March 11, 2024, https://www.defense.gov/News/Transcripts/Transcript/Article/3703783/deputy-secretary-of-defense-kathleen-h-hicks-and-vice-chairman-of-the-joint-chi/.

13 Kathleen H. Hicks, "Structuring Change to Last," remarks to the National Defense Industrial Association, August 7, 2024, https://www.defense.gov/News/Speeches/Speech/Article/3864270/keynote-address-by-deputy-secretary-of-defense-kathleen-h-hicks-structuring-cha/.

14 DoD, "FY 2022 Press Release: Defense Budget," May 28, 2021, 2, https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2022/FY2022_Press_Release.pdf; DoD, "FY 2023 Press Release: Defense Budget," March 28. 2022, https://www.defense.gov/News/Releases/Release/Article/2980014/the-department-of-defense-releases-the-presidents-fiscal-year-2023-defense-budg/; and DoD, "FY 2024 Press Release: Defense Budget," March 13, 2023, https://www.defense.gov/News/Releases/Release/Article/3326875/department-of-defense-releases-the-presidents-fiscal-year-2024-defense-budget/.

illustrate the range of options but do not incorporate every worthy proposal.[15] Several technical adjustments were made, where necessary, to achieve comparability across proposals.[16]

FIGURE 3: COMPETING PROPOSALS FOR DOD BASE BUDGET (CURRENT DOLLAR BILLIONS)



Sources: DoD, Congress, CBO, National Defense Strategy (NDS) Commission, Heritage Foundation, Center for Renewing America (CRA).[17]

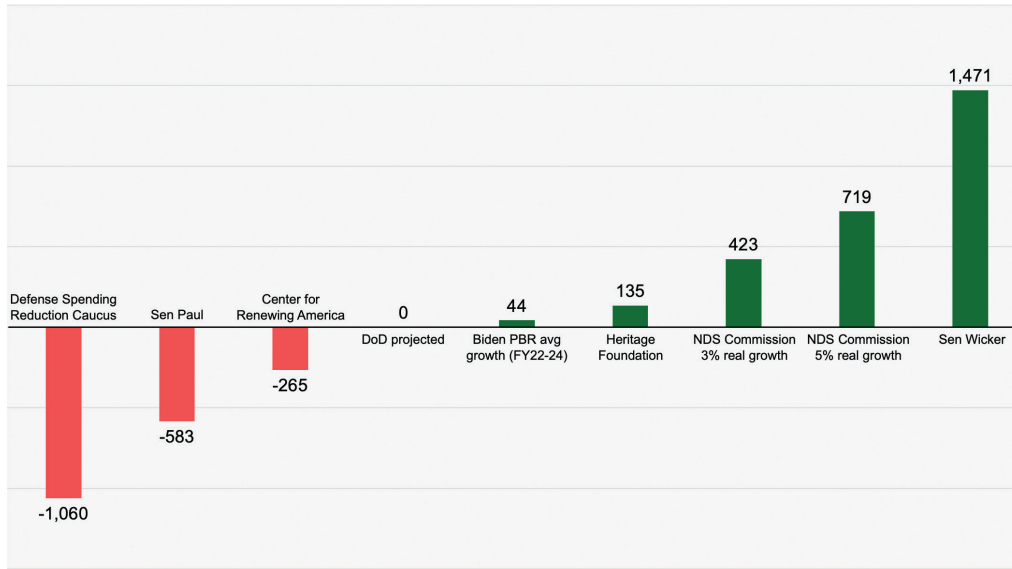
Notes: Discretionary budget authority in billions nominal $. Excludes supplemental funding. Appendix A provides estimated year-by-year figures for each proposal. Estimated FRA-23 sequester equals 95 percent of the national defense (050) FRA-23 revised cap of $849.8 billion. Wicker plan assumes national defense (050) equals $950 billion in FY25 and reaches 5 percent of CBO-projected GDP in FY31. NDS Commission assumes real growth begins in FY25. Heritage plan extrapolates 3 percent nominal growth recommendation for FY25 through FY29. Biden president's budget request (PBR) average growth calculated without including FY25 request to reflect the administration's pattern of decision-making prior to FRA-23. CRA assumes DoD base budget receives 95 percent of national defense (050) topline. Defense Spending Reduction Caucus assumes FY24 base budget equals $100 billion less than FY22 enacted level and then the base budget grows 2 percent nominally each year from FY25 to FY29.

15 One example is Rachel Esplin Odell et al., *Active Denial: A Roadmap to a More Effective, Stabilizing, and Sustainable U.S. Defense Strategy in Asia* (Washington, DC: Quincy Institute, June 2022), https://quincyinst.s3.amazonaws.com/wp-content/uploads/2022/06/17214308/QUINCY-REPORT-ACTIVE-DENIAL-JUNE-2022-2.pdf.

16 First, for the three proposals (CRA, Paul, Defense Spending Reduction Caucus) designed for enactment prior to FY25, the analysis portrayed spending levels as if the proposals had been adopted when introduced (as opposed to using FY25 as the first year of the proposed spending profile). Second, for the three proposals (Wicker, CRA, Paul) aimed at national defense spending (function 050), the analysis multiplied the proposed annual spending levels by 95 percent, equal to the base budget's typical share of 050 spending. Third, for the one proposal (Heritage Foundation) crafted strictly for FY25 without any outyear recommendations, the analysis extrapolated the proposed FY25 growth rate forward through FY29.

17 DoD, "FY 2025 Budget Briefing," 24; Roger Wicker, *Peace through Strength: A Generational Investment in the U.S. Military*, May 29, 2024, 10, https://www.wicker.senate.gov/services/files/BC957888-0A93-432F-A49E-6202768A9CE0; CBO, *An Update to the Budget and Economic Outlook: 2024 to 2034*, Economic Projections Supporting Data (by FY), June 2024, https://www.cbo.gov/system/files/2024-06/51135-2024-06-Economic-Projections.xlsx; National Defense Strategy (NDS) Commission, *Final Report 2024*, July 2024, xii, https://www.rand.org/nsrd/projects/NDS-commission.html; Robert Greenway et al., *A Conservative Defense Budget for Fiscal Year 2025* (Washington, DC: Heritage Foundation, April 2, 2024), 2, https://www.heritage.org/sites/default/files/2024-04/SR281_6.pdf; Barbara Lee, "Reps. Lee, Pocan Reintroduce People Over Pentagon Act to Cut Bloated Defense Budget by $100 Billion," February 22, 2023, https://lee.house.gov/news/press-releases/reps-lee-pocan-reintroduce-people-over-pentagon-act-to-cut-bloated-defense-budget-by-100-billion; Center for Renewing America (CRA), *A Commitment to End Woke and Weaponized Government: 2023 Budget Proposal* (Washington, DC: CRA, December 2022), 99, https://americarenewing.com/wp-content/uploads/2024/03/Budget-Center-for-Renewing-America-FY23.pdf; and Rand Paul, Senate Concurrent Resolution 41, June 6, 2022, https://www.congress.gov/117/bills/sconres41/BILLS-117sconres41pcs.pdf.

FIGURE 4: FIVE-YEAR SPENDING DIFFERENCES, COMPETING PROPOSALS VS. DOD PROJECTED BASE BUDGET (CURRENT DOLLAR BILLIONS), FY25 TO FY29



Sources: DoD, Congress, CBO, NDS Commission, Heritage Foundation, and CRA. See Figure 3.

Notes: Discretionary budget authority in billions nominal $. Excludes supplemental funding. Appendix A provides estimated year-by-year figures for each proposal. See Figure 3 for additional notes.

The side-by-side presentation helps reduce confusion arising from proposals using different categories (base budget, national defense, etc.) and different metrics (GDP percentage, real growth percentage, etc.). To acknowledge a limitation, the presentation does not explain how these proposals would change U.S. military capabilities or how the resulting forces would perform in combat against China or Russia. The proposals by Senator Wicker, the National Defense Strategy (NDS) Commission, and the Heritage Foundation offer granular recommendations suitable for in-depth assessment. Such assessments lie beyond the chapter's scope but could drive future research.

The side-by-side presentation also highlights a puzzling reality about defense budgets entering 2025. American policymakers, experts, and citizens increasingly agree that China poses a serious threat to U.S. interests.[18] Yet, that shared belief has not led to convergence around a narrower range of defense spending options. Although several proposals are in close orbit, others occupy different galaxies.

Some observers might find this divergence unsurprising. Views on optimal spending varied widely during the Cold War, they might say, and translating threat perceptions into spending proposals never leads to "the one true budget." These points are well taken; that said,

18 Craig Kafura, *Americans Feel More Threat from China Now than in Past Three Decades* (Chicago, IL: Chicago Council on Global Affairs, November 12, 2023), https://globalaffairs.org/research/public-opinion-survey/americans-feel-more-threat-china-now-past-three-decades.

defense analysis aims to illuminate considerations lurking below the surface that drive the differences between wide-ranging options. Focusing on these factors enables policymakers to make choices with greater sophistication, especially in contexts featuring disparate possibilities. With that goal in mind, the next step is understanding what drives differences in the proposals.

NATO Spending Is Driving the Debate

One issue driving the current U.S. defense budget debate is NATO military spending. American strategists largely agree about the need to continue applying significant resources to balance the threat from China, but NATO spending is a more polarizing topic. A small but growing number of strategists have advocated reducing the resources devoted to supporting NATO against the threat from Russia.[19] In their view, paring U.S. spending on Europe will free funding to defend the homeland and meet the primary challenge from China without large increases in overall spending. Furthermore, U.S. restraint in Europe will encourage other NATO countries to invest more to defend themselves, including by meeting or exceeding the 2014 Wales Pledge to spend at least 2 percent of GDP on defense and at least 20 percent of defense budgets on equipment.

This dispute among American strategists reflects arguments occurring at the highest levels of American politics. For years, Trump has criticized NATO countries for underinvesting in defense. He has threatened to abandon allies if they fell below the 2 percent target.[20] In late August 2024, he said NATO countries should spend 3 percent.[21] In early November, new NATO Secretary General Mark Rutte stated that countries will have to spend "much more" than 2 percent, so Trump is not alone in arguing for bigger budgets.[22]

19 Sumantra Maitra, *Pivoting the U.S. Away from Europe to a Dormant NATO* (Washington, DC: CRA, February 16, 2023), https://americarenewing.com/policy-brief-pivoting-the-us-away-from-europe-to-a-dormant-nato/; and Alex Velez-Green and Robert Peters, *The Prioritization Imperative: A Strategy to Defend America's Interests in a More Dangerous World* (Washington, DC: Heritage Foundation, August 2024), https://www.heritage.org/defense/report/the-prioritization-imperative-strategy-defend-americas-interests-more-dangerous.

20 Haley Ott, "NATO Chief Says Trump Comment 'Undermines All of Our Security,'" *CBS News*, February 12, 2024, https://www.cbsnews.com/news/nato-chief-says-trump-comment-undermines-all-of-our-security/.

21 Hitchens, "Trump Promises to Create Space National Guard."

22 Joshua Posaner and Barbara Moens, "Trump Is 'Right': Rutte Says NATO Members Need to Spend More on Arms," *Politico Pro*, November 7, 2024.

Meanwhile, Biden vigorously reaffirmed his administration's steadfast support for NATO and praised the alliance for making progress on the 2 percent target.[23] Republican leaders such as Senator Mitch McConnell echoed Biden's commitment to NATO while criticizing other administration policies.[24]

Despite NATO spending's central role in U.S. debates, research has rarely explored what meeting different spending targets would mean for NATO. The next chapter helps fill that gap.

23 Joseph R. Biden, remarks on the 75th anniversary of the NATO alliance, July 9, 2024, https://www.whitehouse.gov/briefing-room/speeches-remarks/2024/07/09/remarks-by-president-biden-on-the-75th-anniversary-of-the-north-atlantic-treaty-organization-alliance/.

24 Mitch McConnell, "We Cannot Repeat the Mistakes of the 1930s," *New York Times*, June 6, 2024, https://www.nytimes.com/2024/06/06/opinion/mcconnell-military-spending-d-day.html.

CHAPTER 2

NATO Spending and Capability Increases under Different Spending Targets—and Three Ways to Reach Outcomes Commensurate with 2 Percent GDP

All spending figures represent FY 2025 constant U.S. dollars unless otherwise noted.

This chapter presents a three-part analysis of future NATO defense spending. It first estimates how much additional defense spending—specifically for equipment—would be generated by 2029 under different spending targets. It then illustrates hypothetical military capabilities NATO countries could acquire with that extra spending. Finally, it identifies three options (shift, substitute, siphon) for reaching equipment spending levels commensurate with the 2 percent of GDP target.

Over five years, attaining 2 percent of GDP would increase NATO spending by $156 billion relative to the 2024 status quo, with $36 billion of that going to equipment. Adding $156 billion would be the equivalent of adding two Swedens or four Finlands. Expending $36 billion more on equipment would support acquiring thousands of munitions, hundreds of ground vehicles, dozens of aircraft, and flotillas of ships. Meanwhile, attaining 3 percent of GDP, a target recently suggested by Trump, would increase NATO spending by $932 billion over five years, with $260 billion more for equipment—enough to raise these illustrative acquisitions tenfold.

Experts may deride GDP targets as a crude instrument.[25] They may believe that NATO achieving full compliance with 2 percent is relatively inconsequential because many countries have recently met that goal.

The chapter shows reaching 2 percent would generate new resources that, if invested wisely, would improve NATO's deterrence and defense against Russia. The 2 percent target therefore remains a meaningful goal, in terms of the resources it would create, despite the recent surge in countries meeting that target.

The chapter offers two lessons for future policymaking and research. First, it demonstrates the power of using middle-range metrics like equipment spending to study NATO defense expenditure. Second, it showcases how NATO might use finesse to achieve outcomes commensurate with reaching 2 percent of GDP.

To realize the chapter's NATO spending scenarios, the U.S. defense budget would have to grow in real terms by about 1.8 percent per year, on average, to keep up with forecasted GDP growth. That growth rate sits approximately in the middle of the range illustrated by the eight competing proposals in Chapter 1. Only the Wicker and NDS Commission plans recommend more than 1.8 percent real growth; all others, including the FY 2025 request, recommend less. Achieving 1.8 percent real growth is thus far from guaranteed, given the current American political situation. Nevertheless, average growth has exceeded 1.8 percent in recent years, so that level remains achievable.[26]

NATO Spending: Major Increases and Unanswered Questions

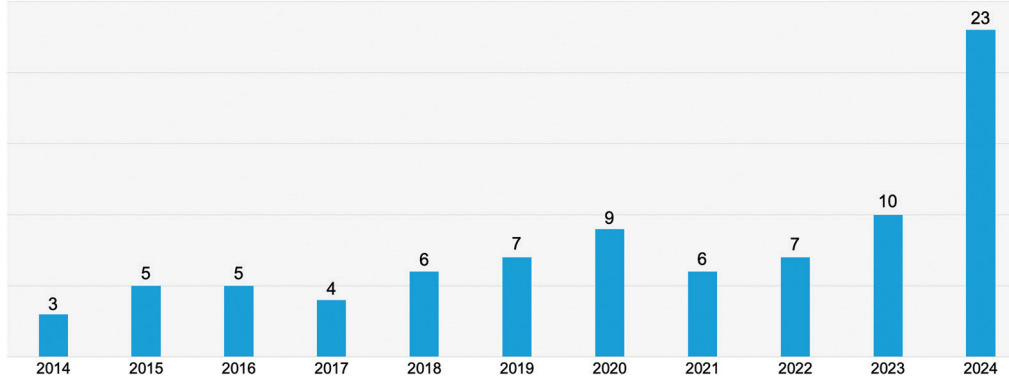
Increases in NATO Spending

NATO defense spending has changed greatly in recent years. In 2021, six countries met the 2 percent of GDP target. In 2024, 23 countries will meet the target, according to NATO estimates (Figure 5). That leaves eight countries noncompliant with the 2 percent GDP target and two noncompliant with the 20 percent equipment target (Figure 6). From 2021 to 2024, non-U.S. NATO annual defense spending increased by 34 percent in real terms—a remarkable intensification of military effort (Figure 7). Only about one fifth of this increase is attributable to Finland and Sweden joining NATO. Of course, these higher spending levels might not last. Russia's 2022 invasion of Ukraine drove the upswing. Cessation of that conflict might sap support for increased spending. Nevertheless, NATO defense spending sits in a different place today than it did a few years ago.

25 Lunn and Williams, *NATO Defence Spending: The Irrationality of 2%*.

26 NDS Commission, *Final Report 2024*, 71.

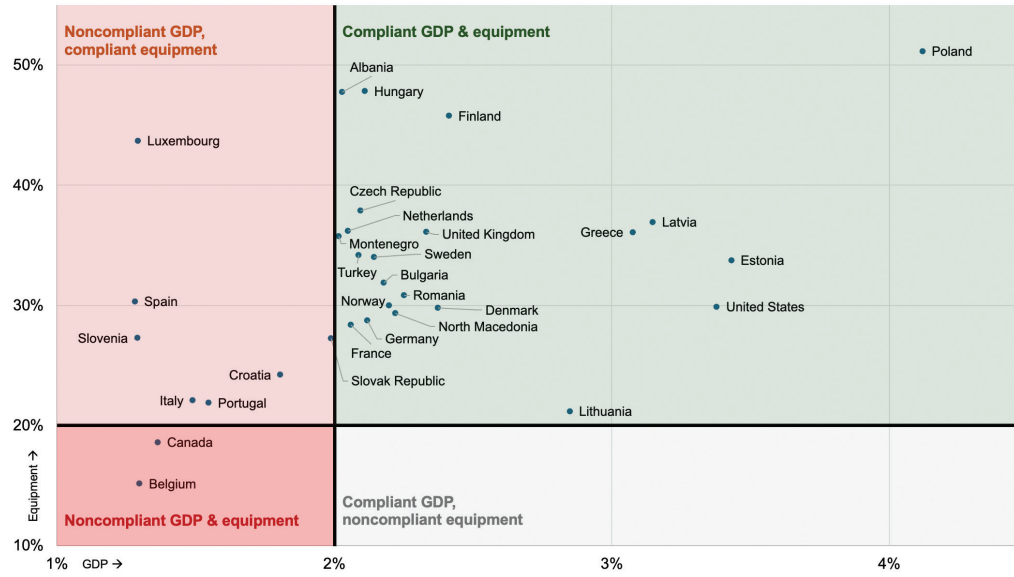
FIGURE 5: NATO COUNTRIES MEETING OR EXCEEDING 2 PERCENT GDP TOPLINE TARGET, 2014 TO 2024 (ESTIMATED)



Source: NATO.[27]

Notes: Figures for 2023 and 2024 are estimates. Chart reflects NATO adding Montenegro in 2017, North Macedonia in 2020, Finland in 2023, and Sweden in 2024.

FIGURE 6: NATO COUNTRY SPENDING RELATIVE TO 2 PERCENT GDP AND 20 PERCENT EQUIPMENT TARGETS, 2024 (ESTIMATED)



Source: NATO.[28]

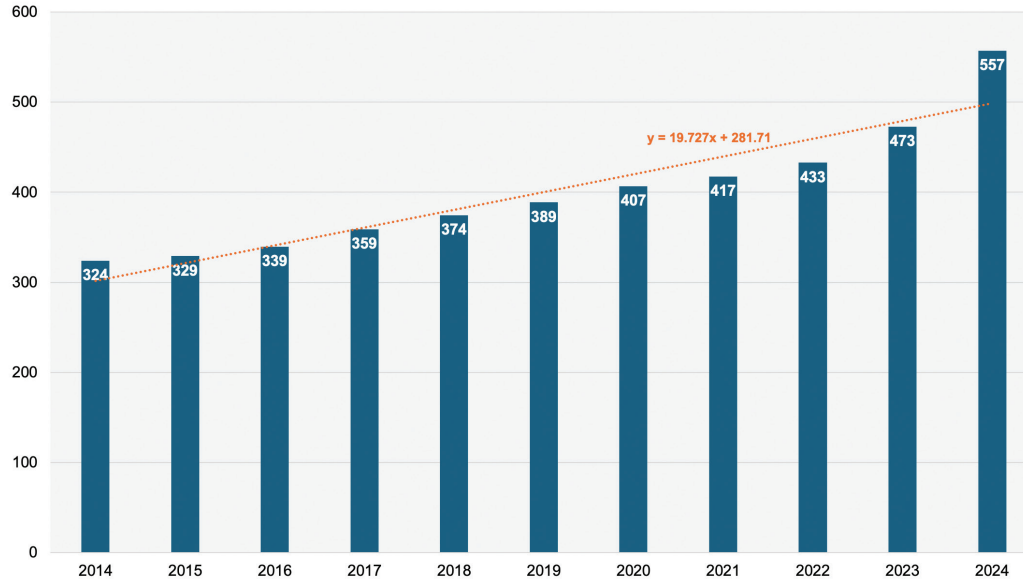
Notes: Figures are estimates.[29]

27 NATO, "Defence Expenditure of NATO Countries (2014–2024)," June 2024, 2, https://www.nato.int/nato_static_fl2014/assets/pdf/2024/6/pdf/240617-def-exp-2024-en.pdf.

28 NATO, "Defence Expenditure of NATO Countries (2014–2024)," 9, 14.

29 For definitions of NATO's four major defense spending categories (equipment, personnel, other [operations and maintenance], and infrastructure), see NATO, "Defence Expenditure of NATO Countries (2014–2024)," 16–17.

FIGURE 7: NON-U.S. NATO DEFENSE SPENDING (CONSTANT FY25$ BILLIONS), 2014 TO 2024



Source: NATO.[30]

Notes: Figures for 2023 and 2024 are estimates. Chart reflects NATO adding Montenegro in 2017, North Macedonia in 2020, Finland in 2023, and Sweden in 2024.

Unanswered Questions

NATO defense spending has fueled political debates, so one would expect analysts to have ready answers to several questions. How much extra defense spending would be generated if all NATO countries met the 2 percent target? What if they went to 3 percent? What military capabilities would that extra spending buy? Are there any alternatives to GDP targets that would produce equivalent results in terms of additional funding and forces?

Surprisingly, analysts have not answered these questions for NATO, to the author's knowledge, though they have examined individual countries such as Canada and regional blocs such as the European Union.[31] Scholars also have explored related issues. They have proposed ways to measure alliance burden sharing that go deeper than tallying defense

30 NATO, "Defence Expenditure of NATO Countries (2014–2024)," 5.

31 Paul Maddison, David Fraser, and John Scott Cowan, *What Spending Two Per Cent of GDP on National Defence Means for Canada* (Calgary: Canadian Global Affairs Institute [CGAI], April 2024), https://assets.nationbuilder.com/cdfai/pages/5563/attachments/original/1712256424/What_Spending_Two_Per_Cent_of_GDP_on_National_Defence_Means_for_Canada.pdf?1712256424; and Mario Draghi, *The Future of European Competitiveness, Part B: In-Depth Analysis and Recommendations* (Brussels, Belgium: European Commission, September 2024), 160–161, https://commission.europa.eu/document/download/ec1409c1-d4b4-4882-8bdd-3519f86bbb92_en.

expenditures.[32] They also have shown that although NATO's 2 percent pledge has led to higher spending, public shaming of governments that fall below the target may undermine burden sharing over time.[33]

Policymakers need to know what meeting the 2 percent (or 3 percent) target would mean militarily for NATO and what alternative policies might produce comparable outcomes. The analysis in this chapter aims to meet that need.

Analysis Setup: Equipment Spending as the Outcome of Interest

The Case for Focusing on Equipment Spending

Of all the metrics one might use to assess prospective changes in NATO's military strength, equipment spending offers a compelling combination of ease and importance. It is relatively simple to measure, and it determines the quantity and quality of new weapons systems that might flow to military forces. For example, it can indicate how many armored ground vehicles, combat aircraft, and warships might be acquired by a nation over time. This information is essential to assessing potential fighting power.

Equipment is certainly not the sole determinant of military power.[34] Readiness, interoperability with allies, morale, and other factors matter enormously. Still, equipment spending relates to many central concerns of defense strategy and military effectiveness.[35] Perhaps the strongest evidence of equipment spending's importance is the fact that NATO, an alliance

32 Wukki Kim and Todd Sandler, "NATO Security Burden Sharing, 1991–2020," *Defense and Peace Economics* 35, no. 3, 2024, 265–280; Sean Monaghan et al., *Is NATO Ready for War?* (Washington, DC: Center for Strategic and International Studies [CSIS], June 2024), https://www.csis.org/analysis/nato-ready-war; King Mallory et al., *Burdensharing and Its Discontents: Understanding and Optimizing Allied Contributions to the Collective Defense* (Santa Monica, CA: RAND Corporation, May 2024), https://www.rand.org/pubs/research_reports/RR4189z1.html; Steven Keil, "NATO Burden Sharing in a New Geopolitical Era," in *NATO 2030: Towards a New Strategic Concept and Beyond*, eds. Jason Blessing, Katherine Kjellström Elgin, and Nele Marianne Ewers-Peters (Washington, DC: Foreign Policy Institute, Henry A. Kissinger Center for Global Affairs, Johns Hopkins University, 2021), 215–233, https://sais.jhu.edu/sites/default/files/NATO2030AndBeyondAccessibleVersion.pdf; and John Dowdy, "More Tooth, Less Tail: Getting beyond NATO's 2 Percent Rule," in *The World Turned Upside Down: Maintaining American Leadership in a Dangerous Age*, eds. Nicholas Burns, Leah Bitounis, and Jonathon Price (Washington, DC: Aspen Institute, 2017), 151–166, https://www.aspeninstitute.org/wp-content/uploads/2017/11/FINAL-ASG-World-Upside-Down-FINAL.REV_.pdf.

33 Jordan Becker, "Pledge and Forget? Testing the Effects of NATO's Wales Pledge on Defense Investment," *International Studies Perspectives* 25, no. 4, November 2024, 490–517; and Jordan Becker et al., "Transatlantic Shakedown: Presidential Shaming and NATO Burden Sharing," *Journal of Conflict Resolution* 68, no. 2–3, February-March 2024, 195–229.

34 Stephen Biddle, *Military Power: Explaining Victory and Defeat in Modern Battle* (Princeton, NJ: Princeton University Press, 2004).

35 Emily O. Goldman, "International Competition and Military Effectiveness: Naval Air Power, 1919–1945," in *Creating Military Power: The Sources of Military Effectiveness*, eds. Risa A. Brooks and Elizabeth A. Stanley (Stanford, CA: Stanford University Press, 2007), 158–185.

that often spars over details, agreed to a specific spending percentage (20 percent) in the Wales Pledge.

The analysis uses equipment spending as its key indicator. It estimates how much equipment expenditure would be created if NATO reached different spending targets and then illustrates what military capabilities could be acquired with those expenditures. Extra equipment spending therefore determines additional capabilities.

Although the analysis emphasizes equipment cost, it also estimates the cost of manning, operating, and basing that equipment to avoid understating the burden placed on overall defense spending.[36] In other words, the analysis uses equipment cost to constrain the adding of new capabilities, and it also computes the associated nonequipment cost to provide a total cost.

To estimate future spending, the analysis uses NATO's established country-level benchmarks: (a) defense spending as a percentage of GDP and (b) equipment spending as a percentage of defense spending. These metrics have well-known limitations.[37] A country's performance on percentage targets may not accurately reflect its contributions to NATO strength.[38] The military significance of any spending percentage depends entirely on what was achieved with the money.

Although this analysis cannot escape these limitations, its assessment of future spending weaves together considerations related to politics, industry, recruiting, rates of change, alliance coordination, military strategy, burden sharing, and regional prioritization. The analysis thus delivers the most holistic assessment possible while still centering on NATO's two benchmarks.

Ultimately, the analysis's focus on equipment spending sits in the middle range between the narrowing and widening approaches to evaluating NATO defense spending.[39] The narrowing approach, often favored by political leaders and American critics of NATO, primarily judges

36 The analysis therefore considered both up-front procurement cost and subsequent operating cost for military equipment.

37 John R. Deni, "Burden Sharing and NATO's 2 Percent Goal," Carnegie Endowment, April 14, 2015, https://carnegieendowment.org/europe/strategic-europe/2015/04/burden-sharing-and-natos-2-percent-goal; and Seamus Daniels and Kathleen Hicks, "Redefining NATO Security Investment: Moving beyond 2 Percent," *War on the Rocks*, July 11, 2018, https://warontherocks.com/2018/07/redefining-nato-security-investment-moving-beyond-2-percent/.

38 Greece and Demark illustrate the point. Greece currently spends over 3 percent of GDP on defense and 36 percent of that amount on equipment, performing excellently target-wise, but it has repeatedly deployed fewer troops to NATO operations than much smaller countries. Conversely, Denmark currently spends 2.4 percent of GDP and 30 percent on equipment, performing more modestly target-wise, but it disproportionally contributes to NATO in terms of capabilities fielded and troops contributed. Deni, "Burden Sharing and NATO's 2 Percent Goal."

39 The approaches reflect broader trends in security scholarship. Barry Buzan and Lene Hansen, *The Evolution of International Security Studies* (New York: Cambridge University Press, 2009), especially chapter 7.

alliance spending using NATO's principal metric, GDP percentage.[40] The analysis diverges from the narrowing approach by evaluating spending using an array of factors beyond GDP percentage. That said, the analysis is only one step removed from the narrowing approach because the outcome of interest, equipment spending, is also a NATO benchmark, albeit one receiving far less attention than GDP percentage.

The widening approach, often favored by scholars and American defenders of NATO, advocates judging alliance spending using wide-ranging criteria including nonmonetary soft power contributions.[41] The analysis departs from the widening approach by evaluating spending primarily in terms of military equipment, an orientation that is as hard power as it gets. Still, the analysis's attentiveness to politics and other considerations, even if always tethered to hard power, reflect the central concerns of the widening approach.

Upward Trajectory of NATO Equipment Spending

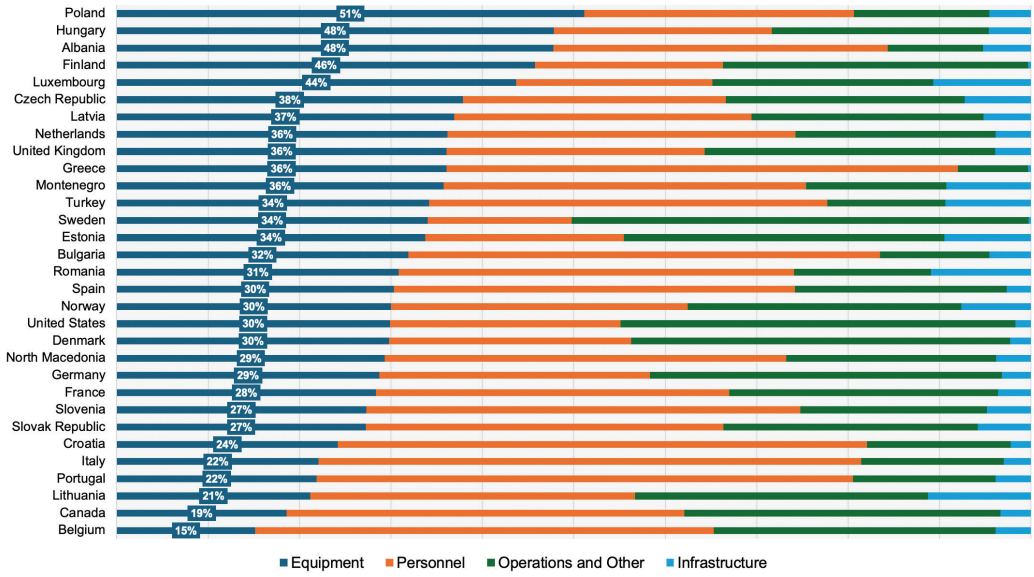
Over the past decade, NATO members have increased equipment spending. Equipment expenditure is thus not trapped in unalterable inertia and offers a suitable focal point for analysis. Of note, NATO's equipment spending category includes both procurement and research and development.

In 2024, NATO's median equipment spending percentage was 31 percent (Figure 8). Most countries exceeded the 20 percent minimum. If NATO raised the equipment target to 28 percent, then it would have had the same number of equipment target noncompliers (eight) as it did 2 percent GDP target noncompliers in 2024.

40 Political leaders' emphasis on this metric makes sense. The metric both constitutes official NATO policy and addresses a higher order consideration, the portion of national wealth devoted to defense, commensurate with a political leader's broad ambit.

41 Kathleen H. Hicks et al., *Counting Dollars or Measuring Value: Assessing NATO and Partner Burden Sharing* (Washington, DC: CSIS, July 2018), 21–29, https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/180703_Hicks_CountingDollars.pdf.

FIGURE 8: NATO COUNTRY SPENDING ALLOCATION PERCENTAGES, SORTED BY EQUIPMENT, 2024 (ESTIMATED)



Source: NATO.[42]

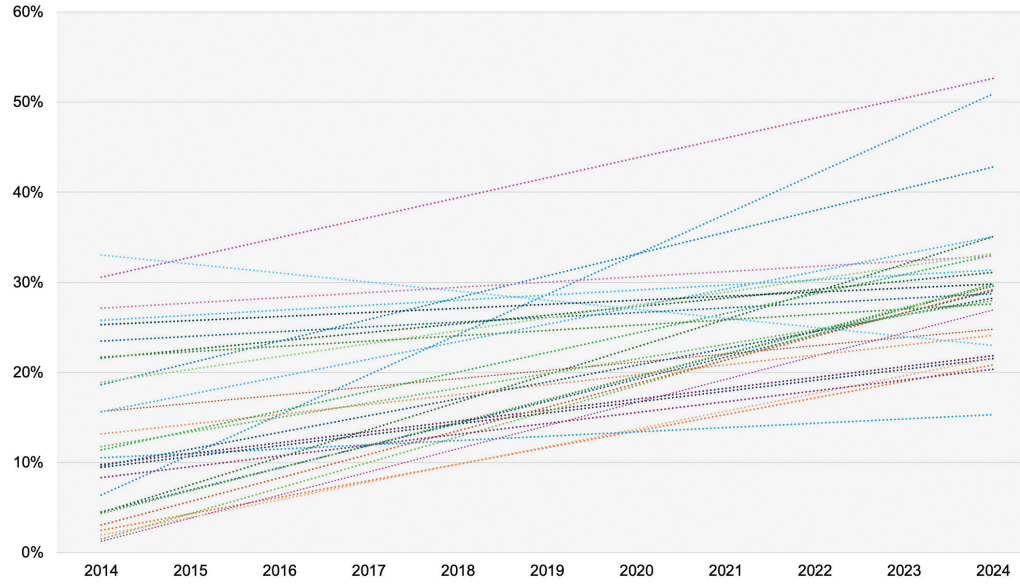
Notes: Figures are estimates.

Ten-year linear trendlines of NATO countries' equipment spending percentages show an unambiguous upward trend (Figure 9). The pattern holds even when excluding data from the recent Ukraine war years.[43] In fact, every current NATO member except Sweden is devoting a higher percentage of its defense spending to equipment in 2024 than it did in 2014 (Sweden did not belong to the alliance in 2014). Even Sweden's allocation has grown by 14 percentage points since 2021, and it currently sits in NATO's top half of equipment spenders (by percentage).

42 NATO, "Defence Expenditure of NATO Countries (2014–2024)," 6.

43 In 2021, only Albania and Canada had lower equipment spending percentages than they had in 2014.

FIGURE 9: NATO COUNTRY EQUIPMENT SPENDING PERCENTAGE LINEAR TRENDLINES, 2014 TO 2024



Source: NATO.[44]

Notes: Figures for 2023 and 2024 are estimates.

How Much Additional Funding? Future Scenarios under Different Spending Targets

In its first step, the analysis estimates how much additional defense spending, specifically for equipment, would be generated under different topline and equipment targets. If NATO met the 2 percent GDP or 3 percent GDP targets by 2029, then it would generate an additional $36 billion or $261 billion, respectively, in equipment spending over the next five years relative to continuing the 2024 status quo.

The 2 percent level, $36 billion, would be large enough to acquire militarily significant capabilities. All of NATO reaching 2 percent therefore remains a meaningful goal despite the recent surge in countries complying with that target. Contemporary circumstances and historical precedents suggest reaching that target is possible for the eight currently noncompliant countries. Reaching 3 percent, on the other hand, is harder to fathom short of a NATO–Russia war, as it would require all 26 countries that are currently below 3 percent to sustain large annual real growth rates for years on end.

44 NATO, "Defence Expenditure of NATO Countries (2014–2024)," 14.

Method

Unless otherwise noted, the analysis assumes that countries maintain their 2024 spending allocation percentages from 2025 to 2029.[45] For topline targets, the analysis considers four scenarios for the 2025–2029 period:[46]

- Maintain current (2024) defense spending GDP percentages (U.S. spending stays at current GDP percentage in this scenario).[47]
- Reach 2 percent GDP—the eight countries currently below 2 percent meet it by 2029, and the 23 countries currently at or above 2 percent maintain their 2024 GDP percentages (U.S. spending stays at current GDP percentage in this scenario).[48]
- Reach 3 percent GDP—the 26 countries currently below 3 percent meet it by 2029, and the five countries currently at or above 3 percent maintain their 2024 GDP percentages (U.S. spending stays at current GDP percentage in this scenario).[49]
- Regress to 2022 defense spending GDP percentages (U.S. spending decreases from current GDP percentage in this scenario).[50]

The first scenario illustrates NATO preserving its current level of effort over the next five years. NATO spending has increased significantly, so maintaining the current effort is far from trivial. The second and third scenarios reflect policies being debated in the United States and NATO. The fourth scenario exemplifies NATO backsliding to its expenditure effort prior to Russia's 2022 invasion of Ukraine.

45 Some might question this assumption. After all, NATO equipment allocation percentages have trended upward. However, budget analysis typically assumes the continuation of current policy (or "services"), not trends, when projecting future spending levels.

46 The analysis uses a five-year time horizon to mirror policymaking (e.g., the U.S. future years defense program), to match the period studied in Chapter 1, and to align with the time some NATO countries have said is needed for them to reach the 2 percent GDP target. Patrick Tucker, "Trump Says NATO Members Should Spend 3% on Defense. Alliance Official: 'Yes,'" *Defense One*, September 1, 2024, https://www.defenseone.com/policy/2024/09/trump-says-nato-members-should-spend-3-defense-alliance-official-yes/399229/.

47 The analysis uses International Monetary Fund (IMF) GDP projections (2025–2029) to maintain consistency with NATO's annual defense spending report. Country-level deflators for 2025–2029 are listed in Appendix B.

48 When estimating the effect of changing a country's topline or equipment target, the analysis assumes that the country phases in the change gradually and reaches the target in 2029. When estimating the effect of increasing a country's equipment target without increasing its topline target, a pair of conditions that require a nonequipment decrease to offset the equipment increase, the analysis assumes personnel spending and operations/other spending are each reduced by half of the equipment increase.

49 NATO likely would consider a deadline later than 2029 because a five-year ramp up to 3 percent would prove too steep for many countries. That said, the analysis retains a 2029 deadline to maintain consistency with the approach used throughout Chapter 1 and Chapter 2.

50 The analysis uses the 2024 GDP percentages for Greece and Italy because they had lower percentages in 2024 than in 2022.

For equipment targets, the analysis considers two scenarios:

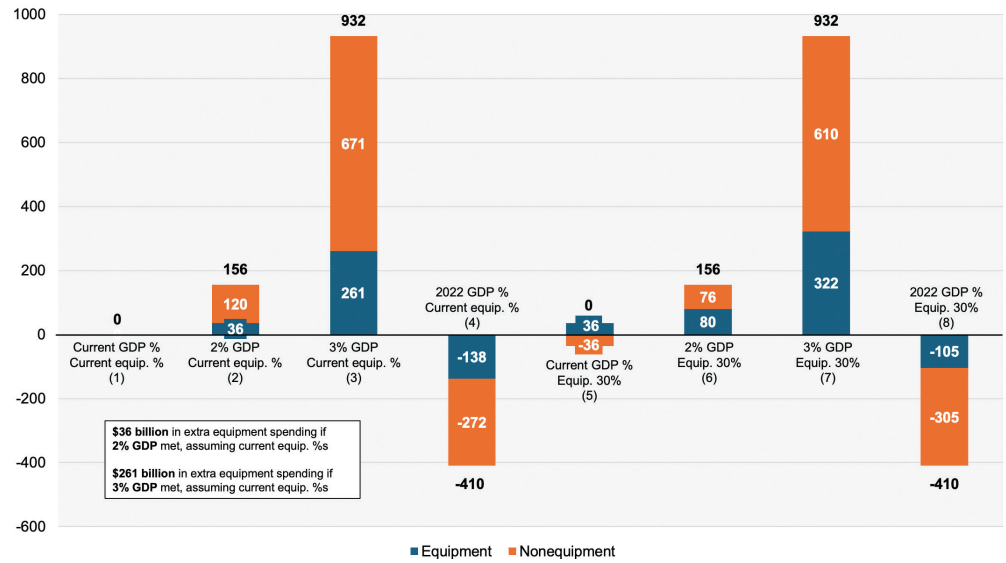
- Maintain current (2024) equipment percentages (U.S. spending stays at current equipment percentage in this scenario).
- Reach 30 percent equipment—the 11 countries currently below 30 percent meet it by 2029, and the 20 countries currently at or above 30 percent maintain their 2024 percentages (U.S. spending stays at current equipment percentage in this scenario).

The first scenario illustrates continuing current equipment allocations, which have grown since 2014. In the second scenario, a 30 percent equipment target is reasonable to explore given that the median allocation was 31 percent in 2024.

Results

Combining the four topline targets and the two equipment targets yields eight scenarios for NATO defense spending (Figure 10). Relative to continuing the 2024 status quo, if all NATO members met the 2 percent GDP target by 2029, that would generate an additional $156 billion in defense spending over five years, with $36 billion of that total going to equipment. If all NATO members met the 3 percent GDP target, that would generate an additional $932 billion over five years, including $261 billion for equipment.

FIGURE 10: ESTIMATED FIVE-YEAR SPENDING DIFFERENCES, STATUS QUO IN 2024 VS. DIFFERENT TOPLINE AND ALLOCATION TARGETS (INCL. U.S., CONSTANT FY25$ BILLIONS), 2025 TO 2029



Source: CSBA estimates based on data from NATO and International Monetary Fund (IMF).[51]

Notes: Totals may not add due to rounding. Appendix B lists the total amounts for each scenario rather than the differences between scenarios displayed here.

51 NATO, "Defence Expenditure of NATO Countries (2014–2024)"; and IMF, *World Economic Outlook*, April 2024, https://www.imf.org/-/media/Files/Publications/WEO/WEO-Database/2024/April/WEOApr2024all.ashx.

Adopting a 30 percent equipment target would produce the same expenditure totals but equipment would receive a larger share, as discussed at the end of this chapter.

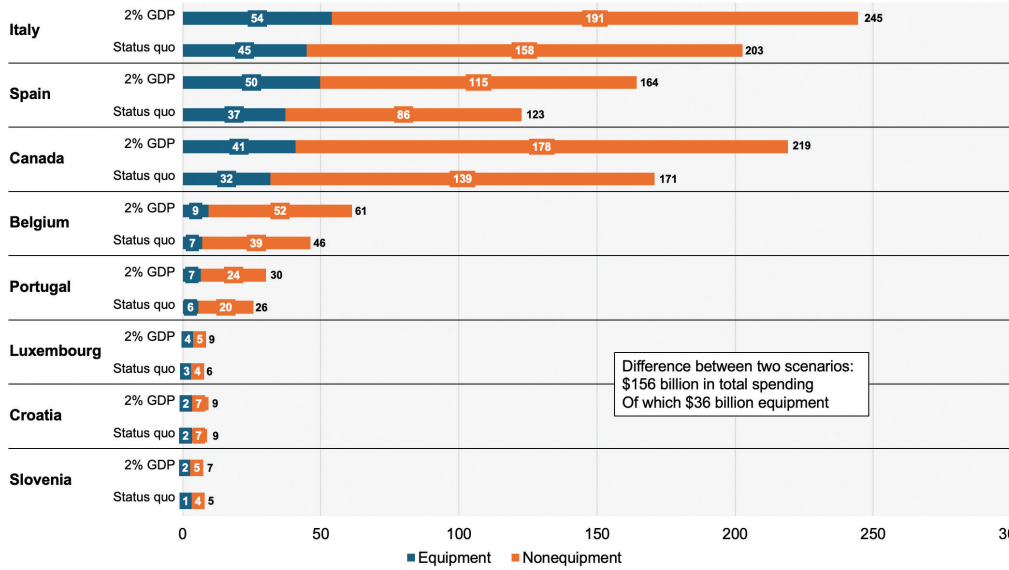
If NATO members returned to 2022 spending levels, then the net change over five years (-$410 billion) would exceed the gain from meeting 2 percent of GDP (+$156 billion) in absolute value terms. In other words, NATO would lose more from backsliding to recent spending levels than it would gain from reaching 2 percent. The United States declining to its 2022 spending level would account for only 15 percent ($62 billion) of the $410 billion total decline, demonstrating that the United States has not driven NATO's recent spending surge.

U.S. defense spending as a percentage of GDP must hold constant through 2029 for most scenarios to hold (the exceptions being the 2022 backsliding scenarios). If the GDP percentage of the United States (or any other country) declined, then the scenarios would produce fewer resources than estimated.

The U.S. defense budget must grow at the same rate as forecasted GDP growth for its GDP percentage to stay steady. Based on the NATO and International Monetary Fund (IMF) data used in the analysis, the U.S. defense budget would have to average around 1.8 percent real growth annually through 2029 to keep pace with GDP. This figure could be somewhat smaller or larger because sources report defense spending and GDP data differently, and the data change constantly. Still, approximately 1.8 percent real growth represents a reasonable estimate of what the United States must do to enable the changes to NATO illustrated in the analysis.

The aggregate changes in NATO spending result from individual changes made by countries that are noncompliant with the target being estimated. In the 2 percent GDP scenario, for example, the $156 billion in extra funding comes from the eight noncompliers collectively increasing their budgets by $156 billion over five years relative to continuing the 2024 status quo (Figure 11).

FIGURE 11: ESTIMATED CHANGES IN FIVE-YEAR DEFENSE SPENDING BY EIGHT NONCOMPLIANT COUNTRIES IF THEY MET 2 PERCENT GDP TARGET BY 2029 (CONSTANT FY25$ BILLIONS)

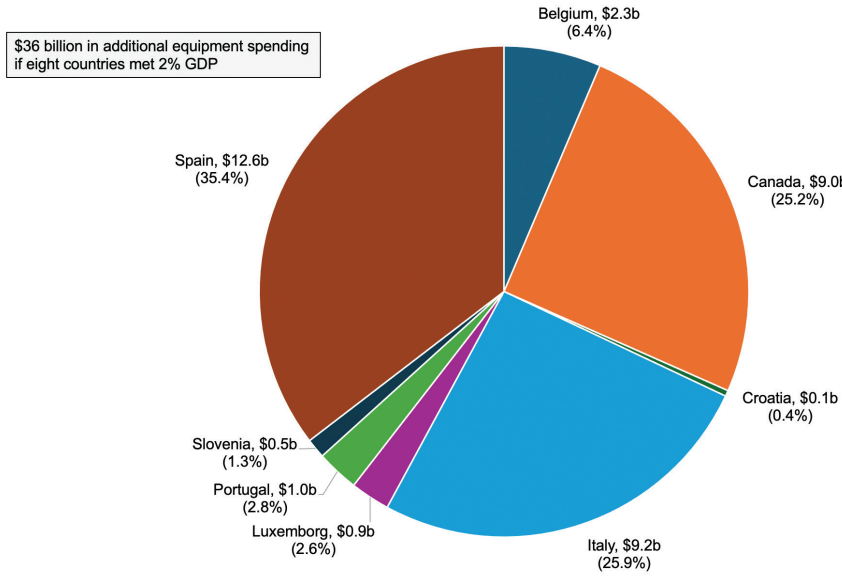


Source: CSBA estimates based on data from NATO and IMF.

Notes: Totals may not add due to rounding.

Because the eight noncompliers have different-sized economies, their responsibility for the extra defense spending varies. In the 2 percent GDP scenario with $36 billion more for equipment, Spain would provide 35 percent ($12.6 billion) of the total, followed by Italy at 26 percent ($9.2 billion), Canada at 25 percent ($9.0 billion), Belgium at 6 percent ($2.3 billion), and the remaining four countries at less than 3 percent (≤$1 billion) each (Figure 12). With shared responsibility for 86 percent of the total extra equipment spending, Spain, Italy, and Canada drive the 2 percent GDP scenario.

FIGURE 12: BREAKOUT OF $36 BILLION IN EXTRA EQUIPMENT SPENDING BY EIGHT NONCOMPLIANT COUNTRIES IF THEY MET 2 PERCENT GDP TARGET BY 2029 (CONSTANT FY25$ BILLIONS)



Source: CSBA estimates based on data from NATO and IMF.

Notes: Totals may not add due to rounding.

Discussion

Significance. The recent increase in NATO members meeting 2 percent of GDP might lead some to believe that achieving full compliance is relatively inconsequential because so much progress has already been made. The analysis refutes that line of thinking. All NATO members reaching 2 percent would generate enough additional resources to be militarily significant, depending on how countries invested the resources (the next section's focus).

Over five years, reaching the 2 percent target would increase NATO defense spending by $156 billion relative to the 2024 status quo. Adding that amount of money is equivalent to the alliance adding two Swedens or four Finlands. Experts can reasonably disagree about whether such expenditure levels are politically feasible. They cannot dispute, however, that those expenditure levels would militarily strengthen NATO. They assuredly would if spent on needed capabilities.

Feasibility. There are two reasons to believe reaching 2 percent GDP is possible. First, several 2 percent noncompliers have made progress toward the target and enjoy public support for higher spending. Spain's defense GDP percentage has increased for five consecutive years, and its government has vowed to reach 2 percent by 2029, though political

obstacles remain.[52] In July 2024, Canada pledged to meet 2 percent by 2032, the first time it has made any public commitment.[53] According to recent polling, pluralities of respondents in four of the five wealthiest noncompliers (Portugal, Belgium, Canada, and Spain) supported higher spending.[54]

Second, there are historical precedents for the spending increases required of the 2 percent noncompliers. Meeting 2 percent by 2029 would require the noncompliant countries to average the following annual real growth rates from 2025 to 2029:

- Belgium: 10.3 percent
- Canada: 10.3 percent
- Croatia: 4.9 percent
- Italy: 7.6 percent
- Luxembourg: 22.4 percent
- Portugal: 7.4 percent
- Slovenia: 11.9 percent
- Spain: 11.5 percent

These growth rates are ambitious, but NATO countries have implemented them before.[55] From 1950 to 1953, as NATO rearmed in the context of the first Soviet nuclear weapon test and the Korean War, Norway averaged real growth of 33 percent; Luxembourg, 31 percent; Denmark, 29 percent; and Italy, 14 percent.[56] Outside that era, the Netherlands maintained 11 percent from 1960 to 1962, and Canada and Italy hit 7–8 percent during 1982–1984 and

52 NATO, "Defence Expenditure of NATO Countries (2014–2024)," 9; Barney Jopson, "Why Spain Is NATO's Laggard on Defence Spending," *Financial Times*, July 9, 2024, https://www.ft.com/content/5803ccb4-5d49-4331-bdbf-100d15cd6526; and Natalia Hidalgo Martínez and Andrew R. Novo, "Spain: NATO's Laggard," *Europe's Edge* (Washington, DC: Center for European Policy Analysis, September 13, 2024), https://cepa.org/article/spain-natos-laggard/.

53 Ismail Shakil, "Canada Unveils for First Time Target Date for NATO Defense Spending Goal," *Reuters*, July 11, 2024, https://www.reuters.com/world/americas/canada-expects-reach-natos-defense-spending-target-by-2032-says-trudeau-2024-07-11/.

54 NATO, "NATO Audience Research: Pre-Summit Polling Results 2024," July 2024, 10, https://www.nato.int/nato_static_fl2014/assets/pdf/2024/7/pdf/240705-pre-summit-polling-results-en.pdf.

55 This paragraph's statistics are drawn from a CSBA assessment of the SIPRI Military Expenditure Database, 1949–2021. The latest version of the dataset is accessible at https://www.sipri.org/databases/milex/.

56 On defense increases during this period, see Richard L. Kugler, *Laying the Foundation: The Evolution of NATO in the 1950s* (Santa Monica, CA: RAND Corporation, June 1990), 48–59, https://www.rand.org/content/dam/rand/pubs/notes/2009/N3105.pdf; and Hastings Ismay, *NATO: The First Five Years, 1949-1954*, "The Increase in Strength," Spring 1955, https://www.nato.int/archives/1st5years/chapters/9.htm.

1986–1988, respectively. NATO countries have chosen to sustain sizable spending increases in the past, including recently during the Ukraine war. They might choose to do so again.

Meeting 3 percent of GDP would be far more demanding. To reach it, annual real increases of 15 percent or more, on average (2025–2029), would be required by Belgium, Canada, Italy, Luxembourg, Portugal, Slovenia, Spain, and Turkey. Sweden and the United Kingdom would have to average 11 percent real growth annually; France, 10 percent; and Germany and the Netherlands, 9 percent.

In sum, reaching 3 percent of GDP would require all 26 countries currently below 3 percent to sustain large real growth rates for five consecutive years. Some NATO counties have met similar rates before, sometimes even at the same time. Yet, all 26 nations simultaneously increasing their spending by so much would be unprecedented. It is hard to envision such an effort materializing short of a NATO–Russia war.

How Many Additional Forces? Illustrative Baskets of Military Capabilities

In its second step, the analysis illustrates hypothetical military capabilities NATO countries could acquire based on the additional equipment spending created by reaching the 2 percent or 3 percent GDP targets. If NATO reached 2 percent of GDP, generating $36 billion more for equipment over five years, then countries could collectively afford to add three mechanized infantry battalions, three Patriot battalions, two fifth-generation fighter squadrons (24 aircraft), three long-endurance unmanned aircraft system (UAS) squadrons (36 aircraft), and two frigate squadrons (six ships). If NATO met 3 percent of GDP, generating $261 billion more for equipment over five years, then countries could collectively afford to add five to nine times more forces of each type. In either scenario, NATO countries could adopt investment strategies emphasizing ground, air, or naval warfare that would change the mix of forces acquired.

Obtaining such capabilities would unquestionably strengthen NATO. The alliance could, as examples, add stealth fighter aircraft or unmanned reconnaissance aircraft that would improve its deterrence and defense against Russia. Because countries, not NATO, would own the capabilities, they would decide whether to supply them to NATO during a conflict with Russia.

Purchasing more weapons would stress the defense industrial base and require recruiting new personnel to operate them. NATO can stimulate increases in industrial capacity by signaling its long-term spending intentions to industry, as exemplified by this analysis. Larger defense budgets would help with the recruiting difficulties facing NATO countries but not resolve them.

Method

The analysis explores a basket of hypothetical military capabilities any NATO country might acquire. The basket contains five types of military forces acquirable in different quantities depending on available funding and preferences among the types. The analysis focused on the 2 percent GDP and 3 percent GDP scenarios because they have received the most attention. For force types, the analysis included five options (Appendix B provides details on each option).

1. Mechanized infantry battalion[57]
2. Patriot air defense battalion[58]
3. Fifth-generation manned fighter squadron with advanced weapons[59]
4. Long-endurance UAS reconnaissance squadron[60]
5. Squadron of three frigates with advanced weapons[61]

The analysis includes these force types for three reasons. First, the force types reflect investments currently being made by the wealthier 2 percent GDP noncompliers, including Belgium, Canada, Italy, and Spain.[62] If they met 2 percent, they might plausibly spend more on these capabilities. Second, the force types generally align with NATO's high-visibility projects, a set of capabilities identified as particularly important for countries to invest in.[63] Third, the force types reflect research by CSBA and other organizations identifying

57 The battalion would include 46 infantry fighting vehicles (IFVs), 24 armored multipurpose vehicles (AMPVs), 32 medium/heavy trucks, and 45 light trucks.

58 The battalion would include 16 launchers, 288 PAC-3 Missile Segment Enhancement (MSE) missiles, 11 IFVs, 17 AMPVs, 65 medium/heavy trucks, and 83 light trucks.

59 The squadron would include 12 aircraft, 720 Joint Air-to-Surface Standoff Missiles (JASSMs), 1,440 AIM-120 Advanced Medium-Range Air-to-Air Missiles (AMRAAMs), and 720 AIM-9X.

60 The squadron would include 12 aircraft.

61 The squadron would include three frigates, 216 Naval Strike Missiles (NSMs), 216 SM-2 Block IIIC missiles, and 216 Block II Evolved Seasparrow Missiles (ESSMs).

62 The four countries have active programs underway to acquire armored ground vehicles, air defenses, F-35s (except Spain), MQ-9s, and frigates. Janes, country profile pages, various dates; Lockheed Martin, "F-35 Lightning II Fast Facts," August 5, 2024, 1, https://www.f35.com/content/dam/lockheed-martin/aero/f35/documents/24-00171_001A%20F-35FastFacts_August_v2.pdf; General Atomics, "MQ-9B: Securing Northern Europe," April 19, 2024, https://www.ga-asi.com/mq-9b-securing-northern-europe; and General Atomics, "Government of Canada Orders the MQ-9B SkyGuardian RPAS from GA-ASI," December 19, 2023, https://www.ga-asi.com/government-of-canada-orders-the-mq-9b-skyguardian-rpas-from-ga-asi.

63 NATO's high-visibility projects list includes, among many other items, maritime multimission aircraft, air defenses, and advanced munitions launchable from the ground, air, and sea. In addition to including these items, the analysis includes several specific weapons currently being acquired with support from the NATO Support and Procurement Agency (NSPA). NSPA helps governments and industry manage weapons requirements, procurement, and life-cycle management, including for capabilities deemed high visibility. NATO, "Multinational Capability Cooperation," June 13, 2024, https://www.nato.int/cps/en/natohq/topics_163289.htm; and NSPA, *Annual Report 2023*, 29, https://www.nspa.nato.int/resources/site1/General/publications/NSPA-Annual-Report-2023.pdf.

the capabilities that would prove most valuable to NATO during operations to repel Russian aggression.[64]

The force types span the ground, air, and naval domains, thereby offering a convenient way to categorize preferences over force types, which the analysis refers to as investment strategies.[65] When selecting quantities of each force type subject to the applicable equipment spending constraint, the balanced strategy acquires nearly equal quantities of the five types. The ground warfare strategy emphasizes acquiring mechanized infantry and Patriot battalions with some air support. The air warfare strategy emphasizes acquiring fighter aircraft and UAS with some air defense. Finally, the naval warfare strategy emphasizes acquiring frigates with some shore-based air support.

Results

By combining two equipment spending scenarios (2 percent GDP and 3 percent GDP) and four investment strategies (balanced, ground, air, and naval), the analysis includes eight iterations of the capability basket (Figure 13 and Table 2). With $36 billion more for equipment (under 2 percent GDP) and a balanced investment strategy, NATO countries could collectively add three mechanized infantry battalions, three Patriot battalions, two fighter squadrons, three UAS squadrons, and two frigate squadrons (Figure 14). Altogether, this basket would include around 11,500 uniformed personnel and 7,900 munitions. It would cost around $43 billion to $49 billion over five years, with equipment equaling $31 billion to $36 billion of that total.[66]

If NATO added $261 billion for equipment (under 3 percent GDP) and adopted the same balanced strategy, countries could collectively add between five and nine times the force type quantities acquired with 2 percent of GDP. This basket would include over 80,000 military personnel and nearly 65,000 munitions. It would cost around $316 billion to $354 billion over five years, with equipment equaling $233 billion to $261 billion of that total.

64 The list of valuable capabilities is long, of course, so the five force types represent only part of what past assessments have recommended. Billy Fabian et al., *Strengthening the Defense of NATO's Eastern Frontier* (Washington, DC: CSBA, 2019), vi–vii, https://csbaonline.org/uploads/documents/Stengthening_the_Defense_of_NATOs_Eastern_Frontier_WEB_1.pdf; Jan van Tol et al., *Deterrence and Defense in the Baltic Region: New Realities* (Washington, DC: CSBA, 2022), vi–x, https://csbaonline.org/uploads/documents/CSBA8312_(Deterrence_Defense_Baltic)_web.pdf; and Clint Reach et al., *Competing with Russia Militarily: Implications of Conventional and Nuclear Conflicts* (Santa Monica, CA: RAND Corporation, June 2021), 22–23, https://www.rand.org/content/dam/rand/pubs/perspectives/PE300/PE330/RAND_PE330.pdf.

65 Some might question focusing on these domains, instead preferring to consider the cyber, space, or other nontraditional capabilities NATO might acquire with additional resources. Future research could emulate the analysis's methods to perform such assessments.

66 The nonequipment costs are smaller than the equipment costs because the analysis only included a five-year timeframe. Thus, the nonequipment costs cover only a fraction of the weapons systems' total nonequipment costs over their expected service lives.

FIGURE 13: ILLUSTRATIVE CAPABILITY BASKETS ATTAINABLE WITH FIVE-YEAR EQUIPMENT SPENDING LEVELS REACHED UNDER 2 OR 3 PERCENT GDP TOPLINE TARGETS (INCL. U.S., CONSTANT FY25$ BILLIONS)

	Strategy 1 Balanced investments	**Strategy 2** Ground warfare	**Strategy 3** Air warfare	**Strategy 4** Naval warfare
$36 billion in extra equipment spending if **2% GDP** met (assuming current equip. %s)	3x Mechanized infantry battalion	7x Mechanized infantry battalion	0x Mechanized infantry battalion	0x Mechanized infantry battalion
	3x Patriot battalion	7x Patriot battalion	1x Patriot battalion	0x Patriot battalion
	2x Fighter squadron w/ adv wpns	1x Fighter squadron w/ adv wpns	6x Fighter squadron w/ adv wpns	1x Fighter squadron w/ adv wpns
	3x Long endurance UAS squadron	2x Long endurance UAS squadron	6x Long endurance UAS squadron	5x Long endurance UAS squadron
	2x Squadron 3 frigates w/ adv wpns	0x Squadron 3 frigates w/ adv wpns	0x Squadron 3 frigates w/ adv wpns	5x Squadron 3 frigates w/ adv wpns
	$43b to $49b total five-year cost • Of which $31b to $36b equip.	$46b to $51b total five-year cost • Of which $32b to $36b equip.	$51b to $54b total five-year cost • Of which $34b to $35b equip.	$37b to $46b total five-year cost • Of which $29b to $36b equip.
$261 billion in extra equipment spending if **3% GDP** met (assuming current equip. %s)	18x Mechanized infantry battalion	42x Mechanized infantry battalion	0x Mechanized infantry battalion	0x Mechanized infantry battalion
	17x Patriot battalion	42x Patriot battalion	16x Patriot battalion	0x Patriot battalion
	17x Fighter squadron w/ adv wpns	16x Fighter squadron w/ adv wpns	39x Fighter squadron w/ adv wpns	16x Fighter squadron w/ adv wpns
	18x Long endurance UAS squadron	16x Long endurance UAS squadron	39x Long endurance UAS squadron	24x Long endurance UAS squadron
	17x Squadron 3 frigates w/ adv wpns	0x Squadron 3 frigates w/ adv wpns	0x Squadron 3 frigates w/ adv wpns	30x Squadron 3 frigates w/ adv wpns
	$316b to $354b total five-year cost • Of which $233b to $261b equip.	$352b to $380b total five-year cost • Of which $247b to $261b equip.	$369b to $389b total five-year cost • Of which $256b to $260b equip.	$289b to $337b total five-year cost • Of which $222b to $261b equip.

Source: CSBA estimates based on data from NATO, DoD, CBO, CSIS, Janes, and media reports. Appendix B details the assumptions, sources, and calculations made for each estimate.

Notes: All cost figures refer to five-year total costs (2025–2029) in FY25 constant dollars.

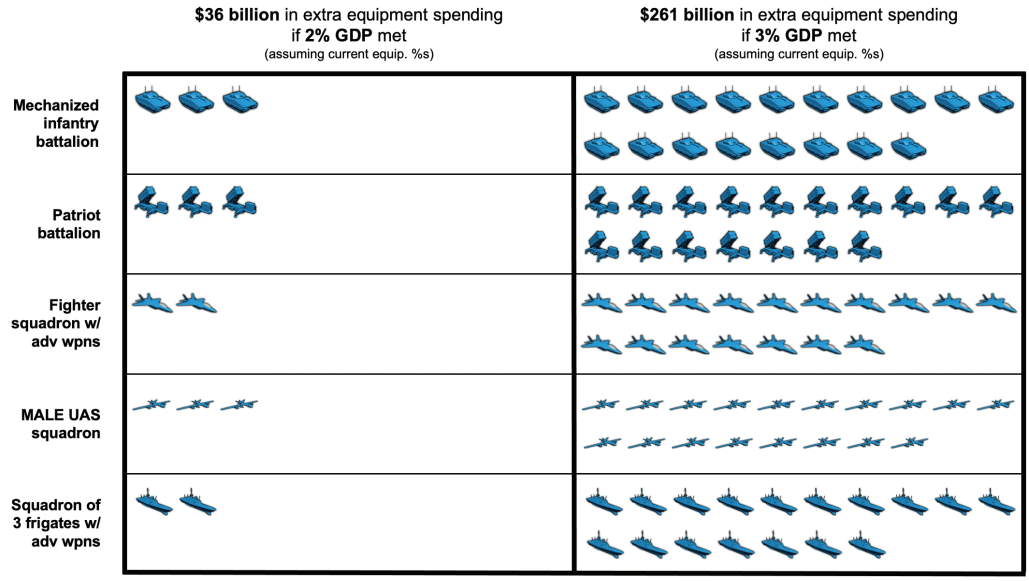
TABLE 2: FORCES ADDED UNDER ILLUSTRATIVE CAPABILITY BASKETS

		Personnel	Ground vehicles	5th-gen fighters	UAS	Frigates	Munitions
$36 billion extra equipment spending (2% GDP)	Basket 1 (balanced)	11,456	969	24	36	6	7,920
	Basket 2 (ground)	13,534	2,261	12	24	0	4,896
	Basket 3 (air)	15,927	176	72	72	0	17,568
	Basket 4 (naval)	8,350	0	12	60	15	6,120
$261 billion extra equipment spending (3% GDP)	Basket 5 (balanced)	80,789	5,638	204	216	51	64,872
	Basket 6 (ground)	102,724	13,566	192	192	0	58,176
	Basket 7 (air)	110,622	2,816	468	468	0	116,928
	Basket 8 (naval)	65,320	0	192	288	90	65,520

Source: CSBA estimates based on data from NATO, DoD, CBO, CSIS, Janes, and media reports. Appendix B details the assumptions, sources, and calculations made for each estimate.

Notes: Ground vehicles include infantry fighting vehicles, armored multipurpose vehicles, medium/heavy trucks, and light trucks. Munitions include PAC-3 Missile Segment Enhancements, Joint Air-to-Surface Standoff Missiles, AIM-120 Advanced Medium-Range Air-to-Air Missiles , AIM-9X Sidewinder, Naval Strike Missiles, SM-2 Block IIICs, and ESSM Block IIs.

FIGURE 14: BALANCED INVESTMENT STRATEGY: ATTAINABLE CAPABILITIES UNDER 2 OR 3 PERCENT GDP TOPLINE TARGETS (INCL. U.S.)



Sources: CSBA estimates based on data from NATO, DoD, CBO, CSIS, Janes, and media reports. Appendix B details the assumptions, sources, and calculations made for each estimate.

Discussion

Significance. The additional defense spending created by reaching 2 percent or 3 percent of GDP could buy formidable capabilities that would strengthen NATO. Meeting the targets would generate additional resources that could be invested in militarily significant capabilities.

Fifth-generation fighter aircraft, for example the F-35, offer a case in point. Non-U.S. NATO members plan to acquire 688 F-35s.[67] At 2 percent of GDP and with an air warfare investment strategy, the non-U.S. NATO F-35 inventory could increase by 10 percent to 760 aircraft. At 3 percent of GDP and with the same air strategy, the non-U.S. inventory could increase by 68 percent to 1,156 aircraft. At those sizes, the non-U.S. F-35 inventory would amount to 47 percent or 72 percent, respectively, of the planned U.S. F-35 inventory by the end of FY 2032 (1,608 aircraft).[68] A combined NATO fighter fleet of these strengths would undoubtedly fare better than the currently planned fleet against Russia during potential conflicts in the 2030s. Fielding such a fleet would also exemplify an unprecedented degree of burden sharing.

67 Lockheed Martin, "F-35 Lightning II Fast Facts"; and Reuters, "Romania Sees Initial Contract to Buy F-35 Fighter Jets, Defence Ministry Says," July 16, 2024, https://www.reuters.com/world/europe/romania-sees-initial-contract-buy-f-35-fighter-jets-defence-ministry-says-2024-07-16/.

68 DoD, *Modernized Selected Acquisition Report F-35*, December 31, 2023, 42, 44, https://www.esd.whs.mil/Portals/54/Documents/FOID/Reading%20Room/Selected_Acquisition_Reports/FY_2023_SARS/(U)F-35_MSAR_Dec_2023.pdf.

Even if NATO countries invested only some of the extra money into the illustrated capabilities, the alliance could still grow appreciably stronger. For instance, fielding a handful of new long-endurance UAS squadrons, totaling fewer than 50 aircraft, would cost less than $5 billion over five years but allow NATO to implement CSBA's Deterrence by Detection operational concept to discourage opportunistic acts of aggression by Russia.[69]

Feasibility. Acquiring capabilities at the scale illustrated by the analysis would stress the defense industrial base. The Ukraine war has exposed deep shortcomings in the military industries supporting NATO countries, shortcomings that will take years to resolve.[70]

One way NATO can improve the industrial base's responsiveness is by signaling to industry that governments will spend significant sums over multiple years as part of integrated defense planning. This demand signal would increase industry's willingness to make up-front investments to expand production capacity, which in turn would increase the feasibility of larger equipment orders in the future. This analysis has sketched a notional future NATO demand signal. The analysis was not constrained by current industrial throughput because that throughput could grow if NATO credibly committed to acquiring the illustrated capabilities. [71]

Even if all NATO countries summoned the political will to spend 2 percent of GDP on defense, that extra money would not be enough to support the capabilities illustrated in this analysis. It would also take people. NATO countries would struggle to grow their armed forces by the number of personnel estimated in the analysis.

For example, nearly 11,500 personnel would be needed to support the first basket ($36 billion, balanced investment). Imagine that the eight countries noncompliant with 2 percent GDP contributed the needed troops and that each country's contribution matched its percentage share of the extra $36 billion for equipment.[72] The eight countries would have to generate the following additional personnel in support of the first basket:

- Belgium: 734
- Canada: 2,887
- Croatia: 44

69 Thomas G. Mahnken, Travis Sharp, and Grace B. Kim, *Deterrence by Detection: A Key Role for Unmanned Aircraft Systems in Great Power Competition* (Washington, DC: CSBA, April 2020), 32, https://csbaonline.org/research/publications/deterrence-by-detection-a-key-role-for-unmanned-aircraft-systems-in-great-power-competition.

70 Katherine Kjellström Elgin and Tyler Hacker, "NATO Has a Munitions Problem, and Europe Needs to Step Up," *Defense News*, February 1, 2024, https://www.defensenews.com/opinion/2024/02/01/nato-has-a-munitions-problem-and-europe-needs-to-step-up/.

71 Shaan Shaikh, "Three Visions for NATO Air and Missile Defense," *War on the Rocks*, August 12, 2024, https://warontherocks.com/2024/08/three-visions-for-nato-air-and-missile-defense/.

72 Figure 12 provides the percentage shares.

- Italy: 2,969
- Luxembourg: 299
- Portugal: 320
- Slovenia: 148
- Spain: 4,054
- **Total: 11,456**

In some cases, countries could reach these numbers through internal transfers whereby troops would stop performing current assignments and start new assignments supporting the basket's capabilities.[73] However, the need for troops with specific skills likely would prevent internal transfers from satisfying all the demand. As a result, at least some countries would have to expand the size of their armed forces through recruiting. They might also have to build or expand facilities to house the larger forces.

Recruiting is very difficult for many noncompliant countries. Canada offers a perfect example. In August 2024, the Canadian military was 8,700 troops below its authorized end strength and had recruited 2,400 new troops for the year, fewer than the 2,887 troops needed for this first basket example.[74] Earlier in 2024, Canadian Defence Minister Bill Blair called his nation's recruiting situation a "death spiral."[75]

With bigger defense budgets, noncompliant countries could offer bonuses and other monetary incentives to aid recruitment and retention. Such measures have not solved troop shortages in many countries, including the United States. There is no golden ticket for getting qualified recruits to enter military service.

Shift, Substitute, or Siphon: Options to Reach Equipment Spending Commensurate with 2 Percent GDP

In its third step, the analysis identifies alternative paths to the equipment spending levels associated with NATO meeting 2 percent GDP. The argument here is that, from a military perspective, what matters most is generating additional equipment spending on par with

73 Internal transfers would align with a strategy in which countries stop trying to generate a full-spectrum force and instead pursue a specialized force optimized for select missions. Richard Shimooka, "Keeping Canada Relevant through Specialization," *War on the Rocks*, August 28, 2024, https://warontherocks.com/2024/08/keeping-canada-relevant-through-specialization/.

74 Murray Brewster, "Canadian Forces Struggling With a Training Bottleneck, Commander Tells MPs," *CBC*, September 26, 2024, https://www.cbc.ca/news/politics/carignan-canadian-forces-recruitment-1.7335232.

75 Philippe Lagassé and Justin Massie, "Don't Count On Us: Canada's Military Unreadiness," *War on the Rocks*, April 11, 2024, https://warontherocks.com/2024/04/dont-count-on-us-canadas-military-unreadiness/; and Charlotte Duval-Lantoine, *Time to Rethink Military Recruitment* (Calgary: CGAI, July 2024), https://www.cgai.ca/time_to_rethink_military_recruitment.

reaching the GDP targets. Of lesser importance is whether GDP targets or another policy produces the extra equipment spending.

NATO can choose from three general approaches: shift, substitute, or siphon. These approaches reflect the standard techniques in defense budgeting to pay for an unfunded priority under constrained resources.[76] *Shifting* involves reducing spending in one defense area to offset increasing spending in another defense area. *Substituting* involves one entity covering another entity's costs. Finally, *siphoning* involves increasing spending in one defense area by absorbing funds from an external source.

To generate equipment spending equivalent to that of the 2 percent of GDP target, NATO could shift by increasing its equipment spending target from 20 percent to 30 percent. It could substitute by encouraging the current 2 percent GDP noncompliers to reach 1.8 percent by 2029 while the United States made up the difference. Finally, it could siphon by redirecting some of the resources currently going to Ukraine into strengthening NATO if the Ukraine war subsides.

NATO could use the same three general approaches to generate equipment spending equivalent to 3 percent of GDP.[77] However, the immense increases associated with this would require NATO to adopt higher targets and make enormous tradeoffs.[78] The feasibility of such moves is highly questionable, particularly if NATO tried to reach 3 percent by 2029.[79]

All three options assume NATO countries continue their current spending levels. If spending declined, then the options would not deliver the same results. The options are therefore viable only in today's context, in which the 2 percent GDP target, the Ukraine war, Russian

76 Philip J. Candreva, *National Defense Budgeting and Financial Management: Policy and Practice*, 2nd ed. (Charlotte, NC: Information Age Publishing, 2024), 234–235.

77 For example, NATO could employ shifting to reach 3 percent of GDP outcomes. If all NATO members devoted 35 percent or more of their defense budgets to equipment by 2029 while maintaining their 2024 GDP percentages, then NATO would gain an additional $261 billion in equipment spending over five years. This would be the same amount as meeting 3 percent GDP while keeping equipment percentages at 2024 levels.

78 To continue the previous footnote's example, implementing a 35 percent equipment target without changing the topline target would require reducing nonequipment spending by $261 billion to offset the equipment increase of $261 billion. Removing anywhere near that much money from nonequipment activities would present serious feasibility challenges. Strategically, synchronizing simultaneous cuts and adds across NATO countries would present a wicked coordination problem. Incompatible country-level choices could cause alliance military power to equal less than the sum of its parts. Politically, cutting funds for military personnel, operations, and infrastructure would unleash fierce criticism and perhaps leave governments electorally vulnerable. Organizationally, many uniformed military leaders would look askance at personnel and operations funding cuts, as these spending areas support the people, readiness, and training that underpin military effectiveness.

79 Continuing the previous two footnotes' example, NATO adopting a 35 percent equipment target would require the United States to raise its equipment spending. The United States increasing its equipment allocation from 30 percent to 35 percent would generate $170 billion (65 percent) of the $261 billion total. However, Washington would likely have to increase its overall equipment spending by much more than $170 billion. Otherwise, it would be devoting 100 percent of the increase to NATO without spending more on other global priorities, including its top concern of China. U.S. policymakers adopting such a policy is unfathomable.

belligerence, and other factors have raised spending.[80] The options can get NATO to equipment spending levels equaling what 2 percent would achieve. On their own, however, the options would not have pushed NATO to its current spending level, nor would they keep it there.

Shift

> Increase equipment target from 20 percent to 30 percent while keeping GDP percentages at 2024 levels (U.S. equipment percentage does not change under this option).

If all NATO members devoted 30 percent of their defense budgets to equipment by 2029 while maintaining their 2024 GDP percentages, then NATO would gain an additional $36 billion in equipment spending over five years.[81] This amount is the same as meeting 2 percent GDP while keeping equipment percentages at 2024 levels.

Reaching 30 percent equipment spending without changing the topline target would require shifting $36 billion from nonequipment spending. Equipment spending would grow by $36 billion while nonequipment spending shrank by $36 billion, yielding net zero change in overall NATO spending.[82] The 30 percent equipment option thus forces NATO countries to eliminate some nonequipment expenditures and reallocate that savings into equipment. The 2 percent of GDP policy does not require such a tradeoff.

Based on 2024 data, the noncomplier group for a 30 percent equipment target would overlap with the noncomplier group for the 2 percent GDP target, though equipment noncompliers would include France and Germany but exclude Spain. Getting equipment noncompliers into compliance while holding their GDP percentages steady might prove more feasible than getting 2 percent GDP noncompliers into compliance. After all, equipment spending percentages have trended upward for a decade and might continue climbing.[83]

One downside of the 30 percent equipment option is that it accepts eight countries not meeting the 2 percent GDP target. This inequity likely would stoke political anger. The 2 percent GDP noncompliers might defuse that anger by raising their equipment spending above 30 percent. For instance, if Spain spent 41 percent of its 2025–2029 defense budget

80 John R. Deni, *Security Threats, American Pressure, and the Role of Key Personnel: How NATO's Defence Planning Process Is Alleviating the Burden-Sharing Dilemma* (Carlisle, PA: U.S. Army War College Press, 2020), https://press.armywarcollege.edu/monographs/919/.

81 See Figure 10.

82 Investing $36 billion more into equipment also involves nonequipment costs to man, operate, and base that equipment. Depending on the investment strategy selected, these nonequipment costs would total $8 billion to $19 billion over five years. Some of the $36 billion in required nonequipment reductions might be repurposed into the $8 billion to $19 billion in required nonequipment additions. For example, military personnel or facilities might be converted from one function to another such that they were counted against both the reduction requirement and the addition requirement. Depending on how these processes unfolded and how governments accounted for them, the nonequipment reduction could be more or less than $36 billion.

83 See Figure 9.

on equipment while keeping its current GDP percentage, then its total equipment spending would be the same as if it met 2 percent GDP by 2029 while keeping its current equipment percentage. Under a flat topline, this approach would entail lowering nonequipment spending to offset higher equipment spending. That offsetting process might prove feasible for Spain. It already devotes a sizable portion of defense spending to equipment, so domestic stakeholders might tolerate going higher. For 2 percent GDP noncompliers with equipment allocations smaller than Spain's, however, going higher could trigger resistance from stakeholders satisfied with the allocation status quo.

Substitute

> Push the eight 2 percent GDP noncompliers to reach 1.8 percent of GDP by 2029 (on their way to 2 percent) while the United States makes up the difference.

If the current 2 percent GDP noncompliers raised their spending to 1.8 percent by 2029, on their way to reaching 2 percent soon after, then NATO would gain $24 billion in equipment spending over five years—$12 billion short of the amount associated with 2 percent GDP ($36 billion). To make up the difference, the United States could increase its equipment spending by $12 billion over five years, an average of $2.4 billion per year.

Doing this might involve, for example, quadrupling annual procurement spending requested through DoD's European Deterrence Initiative (EDI).[84] Routing the additional funding through EDI, rather than some other part of DoD's budget, would help ensure the money supported capabilities needed by NATO.

The obvious downside of this option is that the United States would have to compensate for NATO countries making insufficient investments. Although some American policymakers would take umbrage at the option and dismiss it as unfair, others might be receptive to it, particularly if the 2 percent GDP noncompliers appeared credibly committed to reaching the target soon.

Planners might use two other tactics to convince these persuadable U.S. policymakers. First, allocating the compensatory U.S. spending to procurement, not research and development, might win converts. Some experts have argued DoD recently has overfunded research and development relative to procurement.[85] Congress also continues to pump additional money into procuring favored weapons systems.[86] Steering the compensatory U.S. spending to procurement would thus attract greater political support in Washington.

84 The FY 2025 European Deterrence Initiative procurement request was $617.1 million. DoD, *FY 2025 Budget Estimates European Deterrence Initiative*, March 2024, 3, https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2025/FY2025_EDI_JBook.pdf.

85 Greenway et al., *A Conservative Defense Budget*, 2–3; and Sharp, *Inconsistent Congress*, 3.

86 Travis Sharp and Casey Nicastro, "Hardwired for Hardware: Congressional Adjustments to the Administration's Defense Budget Requests, 2016 to 2023," *Aether* 3, no. 1, Spring 2024, 5–19.

Second, dedicating the compensatory U.S. spending to procuring weapons systems usable in both Europe and other geographic theaters might help convince certain skeptics. A small but vocal group of experts increasingly views the U.S. commitments to Europe and Asia as forcing zero-sum tradeoffs.[87] Acquiring fungible capabilities that can be reallocated across theaters would reassure these critics. Investing in aircraft, for example, might align with this approach because aircraft can be repositioned as security conditions change.

Siphon

> Direct a portion of resources currently going to Ukraine into strengthening NATO if the Ukraine war subsides over next five years (United States shifts funding alongside rest of NATO).

By 2029, the Ukraine war may have ended or transitioned into a less intense phase, thus demanding fewer resources from NATO countries. As this unfolds, NATO countries may choose to redirect some resources that had been going to Ukraine into strengthening NATO more broadly. They might invest more in the general interest of long-term security, or they might invest more because they fear the subsiding of the Ukraine war will free Russia to act aggressively elsewhere, perhaps as retaliation against NATO for supporting Ukraine.

In 2024, NATO pledged to provide Ukraine with $43 billion over the next 12 months. NATO could thus generate the additional equipment spending associated with the 2 percent GDP target ($36 billion) by repurposing 18 percent of its current Ukraine aid, assuming the annual aid amount held constant through 2029. If the aid amount decreased to $20 billion by 2029 as the Ukraine war subsided, perhaps a more realistic case, then NATO would have to repurpose a larger portion (24 percent) of that smaller annual aid stream to generate $36 billion more for equipment, mirroring the 2 percent GDP target.

One downside of this option is that some may view it as betraying Ukraine in that Ukraine would not receive some funds it might otherwise receive. Planners might overcome this objection by emphasizing the fungibility of certain capabilities. If the Ukraine war subsides, then the international community might help stabilize, monitor, or otherwise enforce whatever terms are reached. The equipment needed for these tasks overlaps with the equipment needed by NATO to repel future Russian aggression. One could imagine UAS patrolling demilitarized zones to detect violations that could reinitiate fighting. These same systems also could perform critical missions before and during a future NATO–Russia conflict. Investing in flexible capabilities like these would enable NATO to support postwar Ukraine while simultaneously bolstering defense against Russia.

87 Bryant Harris and Noah Robertson, "As More NATO Countries Meet Spending Targets, Some Push to Raise Goals," *Defense News*, July 10, 2024, https://www.defensenews.com/pentagon/2024/07/10/as-more-nato-countries-meet-spending-targets-some-push-to-raise-goals/,

Conclusion

One curse of defense budget research aimed at informing policy is its relatively short shelf life. Governments adjust their spending plans every year, so the data underpinning any study quickly go out of date. That will prove true of this analysis. Its estimates depended on assumptions rooted in currently available information. When that information changes, as it inevitably will, the assumptions and estimates will no longer be up to date.

Given this reality, the analysis's most important contributions have little to do with any specific estimate. Instead, its contributions come from larger lessons learned while grinding through the modeling. Two lessons stand out above the rest.

First, the analysis demonstrated the power of focusing on middle-range metrics when studying future NATO military strength. Good middle-range metrics will lie between GDP percentage, which is too crude, and the soft power indicators proposed by scholars of burden sharing, which are too far removed from military considerations. The best metrics will indicate future fighting potential, which is what GDP percentage does not predict as well as it presumes to. The analysis used equipment spending in this predictive fashion. Research by John Deni and others has used troop contributions to similarly good effect.[88] Future research can identify other useful middle-range metrics.

Second, the analysis showcased numerous ways in which NATO and its member countries might use finesse to accomplish outcomes on par with the 2 percent of GDP target. For example, emphasizing equipment spending might help NATO bypass mired politics because equipment targets feature slightly different groups of noncomplying countries than GDP targets. Additionally, investing in military capabilities that offer fungibility across geography and missions might help NATO win support from broader political coalitions. The debate over NATO's 2 percent target often seems trapped in an endless rhetorical loop. The analysis showed some ways that creative planners might break that pattern.

88 Deni, *We Don't Really Know.*

APPENDIX A

Supporting Data for Chapter 1 (Competing Budget Proposals)

TABLE A.1: COMPETING PROPOSALS FOR DOD BASE BUDGET (CURRENT DOLLAR BILLIONS), FY25 TO FY29

	FY25	FY26	FY27	FY28	FY29	Total	vs. DoD projected
DoD projected	850	877	895	914	933	4,468	0
Defense Spending Reduction Caucus	655	668	681	695	709	3,408	-1,060
Sen Paul	768	768	768	783	799	3,884	-583
Center for Renewing America	822	842	846	846	847	4,203	-265
Biden PBR avg growth (FY22-24)	850	875	902	929	956	4,512	+44
Heritage Foundation	867	893	920	947	976	4,603	+135
NDS Commission 3% real growth	885	929	976	1,025	1,076	4,891	+423
NDS Commission 5% real growth	902	965	1,033	1,105	1,182	5,187	+719
Sen Wicker	903	1,045	1,188	1,330	1,473	5,939	+1,471

Sources: DoD, Congress, CBO, NDS Commission, Heritage Foundation, and CRA. See Figure 3.

Notes: Discretionary budget authority in billions nominal $. Excludes supplemental funding. See Figure 3 for additional notes.

APPENDIX B

Supporting Data for Chapter 2 (NATO Spending Analysis)

All spending figures represent FY 2025 constant U.S. dollars unless otherwise noted.

TABLE B.1: ESTIMATED FIVE-YEAR DEFENSE SPENDING BY NATO (INCL. U.S.) UNDER DIFFERENT TOPLINE AND EQUIPMENT TARGETS (CONSTANT FY25$ BILLIONS), 2025 TO 2029

Scenario	Topline target	Equipment target	Equipment spending	Nonequipment spending	Total
1	Current GDP %	Current %	2,531	5,737	8,268
2	2% GDP	Current %	2,567	5,857	8,424
3	3% GDP	Current %	2,793	6,408	9,200
4	2022 GDP %	Current %	2,393	5,465	7,858
5	Current GDP %	30%	2,567	5,701	8,268
6	2% GDP	30%	2,611	5,812	8,424
7	3% GDP	30%	2,854	6,346	9,200
8	2022 GDP %	30%	2,426	5,431	7,858

Source: CSBA estimates based on data from NATO and IMF.[89]

Notes: Totals may not add due to rounding.

89 NATO, "Defence Expenditure of NATO Countries (2014–2024)"; and IMF, *World Economic Outlook*.

TABLE B.2: COUNTRY-LEVEL DEFLATORS

Country	2025	2026	2027	2028	2029
Albania	1.6333	1.7025	1.7718	1.8411	1.9103
Belgium	1.2525	1.2772	1.3019	1.3266	1.3513
Bulgaria	1.7188	1.7954	1.8719	1.9485	2.0250
Canada	1.2697	1.3018	1.3338	1.3658	1.3978
Croatia	1.2997	1.3313	1.3628	1.3943	1.4258
Czech Republic	1.5680	1.6281	1.6881	1.7482	1.8082
Denmark	1.1682	1.1844	1.2006	1.2167	1.2329
Estonia	1.5397	1.5971	1.6546	1.7120	1.7694
Finland	1.2003	1.2209	1.2415	1.2622	1.2828
France	1.1702	1.1873	1.2044	1.2215	1.2386
Germany	1.2750	1.3031	1.3312	1.3594	1.3875
Greece	1.1151	1.1281	1.1410	1.1540	1.1670
Hungary	1.3946	1.4373	1.4799	1.5226	1.5653
Italy	1.1605	1.1758	1.1912	1.2066	1.2219
Latvia	1.4322	1.4777	1.5231	1.5686	1.6141
Lithuania	1.5510	1.6105	1.6700	1.7295	1.7889
Luxembourg	1.2690	1.2984	1.3278	1.3572	1.3866
Montenegro	1.5030	1.5542	1.6055	1.6567	1.7080
Netherlands	1.2924	1.3234	1.3543	1.3853	1.4162
North Macedonia	1.3579	1.3926	1.4273	1.4620	1.4967
Norway	1.2103	1.2356	1.2610	1.2863	1.3116
Poland	1.2848	1.3187	1.3526	1.3865	1.4205
Portugal	1.2549	1.2804	1.3059	1.3313	1.3568
Romania	1.5595	1.6207	1.6819	1.7431	1.8043
Slovak Republic	1.3149	1.3503	1.3858	1.4212	1.4566
Slovenia	1.2996	1.3317	1.3637	1.3958	1.4278
Spain	1.1986	1.2190	1.2394	1.2598	1.2802
Sweden	1.0552	1.0607	1.0663	1.0718	1.0773
Turkey	0.7370	0.7193	0.7015	0.6838	0.6661
United Kingdom	1.0531	1.0686	1.0841	1.0996	1.1151
United States	1.2955	1.3287	1.3620	1.3952	1.4284

Source: CSBA estimates based on data from NATO and IMF. See Figure 10.

Notes: Estimated via rolling linear forecast.

Cost Estimates for Illustrative Capability Baskets

Nonequipment Costs

The analysis estimated the nonequipment costs associated with each of the five force types (e.g., a fifth-generation fighter squadron) by multiplying the assumed number of military personnel by the average NATO nonequipment (the sum of personnel, operations/other, and infrastructure) spending per service member in 2024. The analysis calculated both the all-NATO average ($204,471 per member), using it as the lower end of the estimated range, and the average for the eight countries currently noncompliant with the 2 percent GDP target ($231,945 per member), using it as the higher end of the range. The analysis multiplied these costs per member per year by five to generate five-year costs.

The analysis then checked its higher-end non-equipment estimates against CBO's most recent operation and support estimates.[90] The two sets of estimates were relatively close in the cases of the Patriot battalion (CBO higher by 4.0 percent), fighter squadron (CBO lower by 4.6 percent), and UAS squadron (CBO lower by 11.7 percent). The two sets were not close in the cases of the mechanized infantry battalion (CBO higher by 99.6 percent) and the frigate squadron (CBO higher by 91.5 percent).

Based on this comparison and to be methodologically consistent, the author elected to incorporate only his own higher-end non-equipment estimates, not CBO's. This choice may underestimate the nonequipment costs of the mechanized infantry battalion and frigate squadron. This potential underestimate is less worrisome for the capital-intensive frigate squadron because nonequipment costs were only 20 percent of its estimated five-year total cost. However, the potential underestimate is more worrisome for the manpower-intensive mechanized infantry battalion because nonequipment costs were 68 percent of its estimated five-year total cost.

Equipment Costs

The analysis estimated the total costs of procuring the listed system types and quantities, assuming those costs were paid over five years (2025-2029). Because the analysis dealt with five-year costs, it did not address the year-to-year procurement profile (spending and quantities) used to reach the total.

Mechanized Infantry Battalion

The analysis assumed that the mechanized infantry battalion consisted of three rifle companies, a headquarters company, and a forward support company. Based on NATO

90 Where necessary, the analysis used adjusted versions of the units estimated by CBO (e.g., the cost of a battalion rather than a brigade). CBO, "Interactive Force Structure Tool," November 8, 2023, https://www.cbo.gov/system/files/2023-11/59696-Data.xlsx.

and CBO data, the analysis assumed that the battalion possessed the following personnel and equipment:[91]

- 735 personnel
- 46 infantry fighting vehicles (IFVs)
- 24 armored multipurpose vehicles (AMPVs)
- 32 medium/heavy trucks
- 45 light trucks

The analysis used the following assumed costs for the different system types:

- IFV:
  - Low end of cost range: Boxer ($10.6 million per vehicle)[92]
  - High end of cost range: Lynx KF41 ($13.2 million per vehicle)[93]
- AMPV: BAE AMPV being procured by U.S. Army ($6.4 million per vehicle)[94]
- Medium/heavy truck: Family of medium tactical vehicles being procured by U.S. Army ($643,900 per vehicle)[95]
- Light truck: Joint light tactical vehicle family of vehicles being procured by U.S. Army ($361,300 per vehicle)[96]

91 NATO, "NATO's Forward Presence," June 2022, https://www.nato.int/nato_static_fl2014/assets/pdf/2022/6/pdf/2206-factsheet_efp_en.pdf; and CBO, *The U.S. Military's Force Structure: A Primer, 2021*, May 2021, 24–27, https://www.cbo.gov/system/files/2021-05/57088-Force-Structure-Primer.pdf.

92 "Lithuania Completes Boxer Procurement, Stands Up Two Battalions," *Defense Aerospace*, January 15, 2024, https://www.defense-aerospace.com/lithuania-completes-boxer-procurement-stands-up-two-battalions/.

93 Sebastian Sprenger, "Hungary Is Rheinmetall's Launch Customer for the Lynx Fighting Vehicle," *Defense News*, September 11, 2020, https://www.defensenews.com/global/europe/2020/09/11/hungary-is-rheinmetalls-launch-customer-for-the-lynx-fighting-vehicle/.

94 DoD, *FY 2025 Budget Estimates Army Procurement of Weapons and Tracked Combat Vehicles*, March 2024, 23, https://www.asafm.army.mil/Portals/72/Documents/BudgetMaterial/2025/Base%20Budget/Procurement/Procurement-of-Weapons-and-Tracked-Combat-Vehicles.pdf.

95 DoD, *FY 2025 Budget Estimates Army Procurement Tactical and Support Vehicles*, March 2024, 125, https://www.asafm.army.mil/Portals/72/Documents/BudgetMaterial/2025/Base%20Budget/Procurement/Other%20Procurement%20-%20BA%201%20-%20Tactical&Support%20Vehicles.pdf.

96 DoD, *FY 2025 Budget Estimates Army Procurement Tactical and Support Vehicles*, 96.

Patriot Air Defense Battalion

The analysis assumed that the Patriot air defense battalion consisted of four firing batteries, a headquarters and headquarters battery, and a forward support company. Based on NATO, CBO, Congressional Research Service, and Janes data, the analysis assumed that the battalion possessed the following personnel and equipment:[97]

- 747 personnel
- 16 Patriot launchers
- 288 PAC-3 Missile Segment Enhancement (MSE) missiles[98]
- 11 IFVs
- 17 AMPVs
- 65 medium/heavy trucks
- 83 light trucks

The analysis used the following assumed costs for the different system types:

- Patriot launchers: Open-source cost estimates ($106.9 million per launcher)[99]
- PAC-3 MSE:
  - Low end of cost range: U.S. Army current estimate ($4.2 million per missile)[100]
  - High end of cost range: DoD selected acquisition report estimate ($4.8 million per missile)[101]
- IFVs, AMPVs, and trucks: The same assumptions as detailed in the section on mechanized infantry battalions

97 NATO, "PATRIOT Deployment," May 2015, 1, https://www.nato.int/nato_static_fl2014/assets/pdf/pdf_2015_05/20150508_1505-Factsheet-PATRIOT_en.pdf; CBO, *The U.S. Military's Force Structure*, 24–27; Andrew Feickert, "PATRIOT Air and Missile Defense System for Ukraine" (Washington, DC: Congressional Research Service, January 18, 2023), 1, https://crsreports.congress.gov/product/pdf/IF/IF12297; and Janes, "Patriot," last updated October 12, 2023.

98 Quantity assumes one full salvo plus two full reloads.

99 Mark F. Cancian and Tom Karako, "Patriot to Ukraine: What Does it Mean?" (Washington, DC: CSIS, December 16, 2022), https://www.csis.org/analysis/patriot-ukraine-what-does-it-mean.

100 DoD, *FY 2025 Budget Estimates Army Missile Procurement*, March 2024, 41, https://www.asafm.army.mil/Portals/72/Documents/BudgetMaterial/2025/Base%20Budget/Procurement/Missile-Procurement-Army.pdf.

101 DoD, *Selected Acquisition Report Patriot Advanced Capability-3 Missile Segment Enhancement*, December 2022, 15, https://www.esd.whs.mil/Portals/54/Documents/FOID/Reading%20Room/Selected_Acquisition_Reports/FY_2022_SARS/PAC-3_MSE_SAR_DEC_2022%20corrections_CAO_2023-04-12_FINAL%20(1).pdf.

Fifth-Generation Manned Fighter Squadron with Advanced Weapons

The analysis assumed that the fighter squadron consisted of 12 aircraft with stockpiles of three munitions: Joint Air-to-Surface Standoff Missile (JASSM), AIM-120 Advanced Medium-Range Air-to-Air Missile (AMRAAM), and AIM-9X Sidewinder. Based on CBO and open-source data, the analysis assumed that the squadron possessed the following personnel and equipment:[102]

- 1,900 personnel (including both direct and indirect support personnel)
- 12 fighter aircraft
- 720 JASSMs[103]
- 1,440 AMRAAMs[104]
- 720 AIM-9Xs[105]

The analysis used the following assumed costs for the different system types:

- Fighter aircraft: F-35A U.S. Air Force current estimate ($116.1 million per aircraft)[106]
- JASSM: U.S. Air Force current estimate ($1.9 million per missile)[107]
- AMRAAM: U.S. Air Force current estimate ($1.1 million per missile)[108]
- AIM-9X: U.S. Air Force current estimate ($729,000 per missile)[109]

102 CBO, *The U.S. Military's Force Structure*, 85.

103 Quantity assumes two JASSMs per aircraft sortie and one sortie per day for 30-day campaign. Lockheed Martin, "JASSM," 2022, https://www.lockheedmartin.com/content/dam/lockheed-martin/mfc/pc/jassm/22-14207-ADSW_JASSM_Product%20Card%20Updates.pdf.

104 Quantity assumes four AMRAAMs per aircraft sortie and one sortie per day for 30-day campaign. Emma Helfrich, "F-35 Closer to Carrying Six AIM-120 Missiles Internally," *The Warzone*, March 24, 2023, https://www.twz.com/adapter-for-f-35-internal-carriage-of-six-aim-120-missiles-is-progressing.

105 Quantity assumes two AIM-9Xs per aircraft sortie and one sortie per day for 30-day campaign. David Isby, "How New Weapons Are Making the F-35 Even More Lethal," *Key Aero*, July 19, 2023, https://www.key.aero/article/how-new-weapons-are-making-f-35-even-more-lethal.

106 DoD, *FY 2025 Budget Estimates Air Force Aircraft Procurement*, March 2024, 111, https://www.saffm.hq.af.mil/Portals/84/documents/FY25/FY25%20Air%20Force%20Aircraft%20Procurement%20Vol%20I.pdf?ver=trnnCwkcSenGdKVniZvWHQ%3d%3d.

107 DoD, *FY 2025 Budget Estimates Air Force Missile Procurement*, March 2024, 71, https://www.saffm.hq.af.mil/Portals/84/documents/FY25/FY25%20Air%20Force%20Missile%20Procurement.pdf?ver=L9Em5rUIlWTS_7Fdhr9ypg%3d%3d.

108 DoD, *FY 2025 Budget Estimates Air Force Missile Procurement*, 127.

109 DoD, *FY 2025 Budget Estimates Air Force Missile Procurement*, 111.

Long-Endurance UAS Reconnaissance Squadron

The analysis assumed that the UAS squadron consisted of 12 aircraft. Based on CBO data, the analysis assumed that the squadron possessed the following personnel and equipment:[110]

- 630 personnel (including both direct and indirect support personnel)
- 12 UAS

The analysis used the following assumed costs for the different system types:

- UAS: MQ-9 DoD selected acquisition report estimate ($29.9 million per aircraft)[111]

Squadron of Three Frigates with Advanced Weapons

The analysis assumed that the frigate squadron consisted of three ships each equipped with a 16-cell vertical launch system (VLS) and stockpiles of three munitions: Naval Strike Missile (NSM), SM-2 Block IIIC, and Evolved Seasparrow Missile (ESSM) Block II. Based on CBO and Janes data, the analysis assumed that the squadron possessed the following personnel and equipment:[112]

- 660 personnel (including both direct and indirect support personnel)
- 3 frigates
- 216 NSMs[113]
- 216 SM-2 Block IIICs[114]
- 216 ESSM Block IIs[115]

110 CBO, *The U.S. Military's Force Structure*, 98.

111 DoD, *Selected Acquisition Report MQ-9*, December 2019, 38, https://www.esd.whs.mil/Portals/54/Documents/FOID/Reading%20Room/Selected_Acquisition_Reports/FY_2019_SARS/20-F-0568_DOC_61_MQ-9_Reaper_SAR_Dec_2019.pdf.

112 CBO, "Interactive Force Structure Tool"; and Janes, "Bergamini (FREMM/FREMM Evo) Class (Multimission Frigates) (FFGHM)," last updated August 1, 2024.

113 Quantity assumes 24 missiles aboard ship with two in-port full reloads for 30-day campaign. David Foxwell, "New Anti-Submarine Warfare Frigates Ordered for Netherlands and Belgium," Royal Institution of Naval Architects, October 4, 2023, https://rina.org.uk/publications/warship-technology/new-anti-submarine-warfare-frigates-ordered-for-netherlands-and-belgium/.

114 Quantity assumes half of each ship's 16 VLS cells filled with SM-2, 24 SM-2s aboard ship, and two in-port full reloads for 30-day campaign. Tyler Barker, "Allies Demonstrate Unrivaled Defensive Capability during Formidable Shield 2023," U.S. Naval Forces Europe-Africa/U.S. Sixth Fleet, May 23, 2023, https://www.dvidshub.net/news/445340/allies-demonstrate-unrivaled-defensive-capability-during-formidable-shield-2023.

115 Quantity assumes half of each ship's 16 VLS cells filled with ESSM, 24 ESSMs aboard ship, and two in-port full reloads for 30-day campaign. Foxwell, "New Anti-Submarine Warfare Frigates."

The analysis used the following assumed costs for the different system types:

- Frigate:
  - Low end of cost range: FFG-62 ($1,058.1 million per ship)[116]
  - High end of cost range: FREMM ($1,479.0 million per ship)[117]
- NSM: U.S. Navy current estimate ($2.4 million per missile)[118]
- SM-2 Block IIIC: Open-source cost estimates ($2.2 million per missile)[119]
- ESSM Block II: Open-source cost estimates ($1.6 million per missile)[120]

116 DoD, *Selected Acquisition Report FFG-62*, December 31, 2023, 16, https://www.esd.whs.mil/Portals/54/Documents/FOID/Reading%20Room/Selected_Acquisition_Reports/FY_2023_SARS/(U)FFG_62_MSAR_Dec_2023.pdf.

117 Pierre Tran, "France Takes Delivery of Its 5th FREMM," *Defense News,* July 25, 2018, https://www.defensenews.com/naval/2018/07/25/france-takes-delivery-of-its-5th-fremm/.

118 DoD, *FY 2025 Budget Estimates Navy Weapons Procurement*, March 2024, 285, https://www.secnav.navy.mil/fmc/fmb/Documents/25pres/WPN_Book.pdf.

119 Wes Rumbaugh, "Cost and Value in Air and Missile Defense Intercepts" (Washington, DC: CSIS, February 13, 2024), https://www.csis.org/analysis/cost-and-value-air-and-missile-defense-intercepts.

120 Rumbaugh, "Cost and Value in Air and Missile Defense Intercepts."

LIST OF ACRONYMS

AMPV	armored multipurpose vehicle
AMRAAM	Advanced Medium-Range Air-to-Air Missile
CBO	Congressional Budget Office
CR	continuing resolution
CSBA	Center for Strategic and Budgetary Assessments
DoD	U.S. Department of Defense
ESSM	Evolved Seasparrow Missile
FRA-23	Fiscal Responsibility Act of 2023
FY	fiscal year
GDP	gross domestic product
IFV	infantry fighting vehicle
IMF	International Monetary Fund
JASSM	Joint Air-to-Surface Standoff Missile
MSE	Missile Segment Enhancement
NATO	North Atlantic Treaty Organization
NDS	National Defense Strategy
NSM	Naval Strike Missile
OMB	Office of Management and Budget
PAC-3	Patriot Advanced Capability-3
PBR	president's budget request
SM-2	Standard Missile-2
UAS	unmanned aircraft system

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