



S T R A T E G Y   F O R   T H E   L O N G   H A U L

CSBA

## **US Defense Budget**

**Options and Choices  
for the Long Haul**

BY STEVEN M. KOSIAK

## **About the Center for Strategic and Budgetary Assessments**

The Center for Strategic and Budgetary Assessments (CSBA) is an independent, nonpartisan policy research institute established to promote innovative thinking and debate about national security strategy and investment options. CSBA's goal is to enable policymakers to make informed decisions on matters of strategy, security policy and resource allocation.

CSBA provides timely, impartial and insightful analyses to senior decision makers in the executive and legislative branches, as well as to the media and the broader national security community. CSBA encourages thoughtful participation in the development of national security strategy and policy, and in the allocation of scarce human and capital resources. CSBA's analysis and outreach focus on key questions related to existing and emerging threats to US national security. Meeting these challenges will require transforming the national security establishment, and we are devoted to helping achieve this end.

## **About the Author**

Steven M. Kosiak, Vice President for Budget Studies, is the author of CSBA's annual defense budget analysis, and numerous other CSBA Reports, Backgrounders and Updates on such topics as war costs, weapons modernization, military readiness, and homeland security, among many others. Mr. Kosiak is a frequent speaker on defense issues and the defense budget process, providing expert testimony before House and Senate Committees, as well as academic and other professional groups. His work has been published in *The New York Times*, *The Washington Post*, and professional and public policy journals. Mr. Kosiak holds a Bachelor of Arts from the University of Minnesota, a Master of Public Affairs from the Woodrow Wilson School at Princeton University, and a Juris Doctor from Georgetown University.

**US DEFENSE BUDGET:  
OPTIONS AND CHOICES FOR THE LONG HAUL**

STRATEGY FOR THE LONG HAUL

By Steven M. Kosiak

## ABOUT THE **STRATEGY FOR THE LONG HAUL** SERIES

This report is one in a series of CSBA's *Strategy for the Long Haul* intended to inform and shape the next administration's defense strategy review.

**THE CHALLENGES TO US NATIONAL SECURITY.** Translates the principal challenges to US security into a representative set of contingencies in order to determine what resources will be required, and how they should be apportioned among forces and capabilities.

**US MILITARY POWER AND CONCEPTS OF OPERATION.** Provides the connective tissue between the threats to US security and the capabilities and force elements needed to address the new challenges confronting the nation.

**THE DEFENSE BUDGET.** Overviews the budget environment and explores a range of options to make the Services' plans more affordable.

**THE DEFENSE INDUSTRIAL BASE.** Addresses the US defense industry's role as a strategic asset, and how it can best serve in that role.

**MANPOWER.** Examines recruitment and retention of quality people in sufficient numbers at an acceptable cost.

**TRAINING, OPERATIONAL ART, AND STRATEGIC COMPETENCE.** Assesses the need for an overhaul of training and education of America's service personnel and the importance of strategic thinking in senior leaders.

**RESTRUCTURING THE US ALLIANCE PORTFOLIO.** Considers the nature and type of alliances the United States needs in order to meet existing and emerging security challenges.

---

**GROUND FORCES.** Explores how the US Army and Marine Corps might best be organized, structured, modernized, and postured to meet existing and emerging challenges to US security.

**SPECIAL FORCES.** Addresses the expansion and growing role of US Special Forces.

**MARITIME FORCES.** Addresses how US maritime forces might best be organized, structured, modernized, and postured to meet existing and emerging challenges to US Security.

**AIR AND SPACE FORCES.** Explores how Air and Space Forces might best be organized, structured, modernized, and postured to meet existing and emerging challenges to US Security.

**STRATEGIC FORCES.** Examines the circumstances under which nuclear strategy and force posture decisions must be made today.

**MODERNIZATION STRATEGIES.** Explores potential modernization strategies that can best support the US defense posture in an era of great geopolitical uncertainty and rapid technological change.

**ORGANIZING FOR NATIONAL SECURITY.** Assesses how the United States Government can best organize itself to ensure effective strategic planning and execution of strategy.

**A GRAND STRATEGY FOR THE UNITED STATES.** Synthesizes the findings and insights of the study series.



## CONTENTS

vii	Executive Summary
1	Introduction
5	Chapter 1. Future Funding Levels for Defense
23	Chapter 2. The Current Long-Term Plan and its Likely Cost
35	Chapter 3. Reconciling the Plans-Funding Mismatch
53	Conclusion
	FIGURES
6	Figure 1. Funding for National Defense, 1946–2009
7	Figure 2. DoD Base and Supplemental Funding, 2000–09
13	Figure 3. Projected Deficits under Current Policies
19	Figure 4. US Defense Spending as a Share of GDP, 1946–2009
38	Figure 5. Precision-Guided Munitions Used by US Forces in Recent Conflicts



The US defense budget is at near-record levels today, having grown dramatically since 2000. There is, however, good reason to question whether defense spending will continue to increase over the next two decades, and whether the Defense Department's current long-term plan is affordable. If it is not, the department will have to consider a range of options for eliminating this mismatch between likely future budget levels and the cost of its plans. These options include cutting force structure, slowing the pace of modernization, accepting older equipment, acquiring less costly new systems, and transforming the military to make it more cost-effective.

# EXECUTIVE SUMMARY

## US DEFENSE BUDGET: OPTIONS AND CHOICES FOR THE LONG HAUL

The Bush Administration has requested \$611 billion for national defense in fiscal year 2009. This includes \$541 billion for the “base” defense budget — \$518 billion for the Department of Defense, and \$23 billion for Department of Energy and other defense-related activities. The base defense budget is intended to cover the military’s long-term — essentially peace-time — force structure, readiness and modernization costs. If approved, the 2009 request would bring the base defense budget to its highest level ever, in real (inflation-adjusted) terms.

In addition, the 2009 request includes \$66 billion in emergency supplemental appropriations for defense, as a partial down-payment on 2009 war-related costs. Eventually, additional 2009 funding — of at least tens of billions of dollars — will have to be provided to cover war-related costs for the full year.

The 2008 defense budget is the highest defense budget, in real terms, since the end of World War II. Depending on how much funding is ultimately provided for military operations, it is possible that the defense budget for 2009 (i.e., including the base budget plus war-related funding) will end up being even higher.

Notwithstanding the recent buildup in defense spending, and the fact that, by historical standards, defense spending now accounts for a relatively small share of the economy, there is good reason to question whether spending for defense will continue to grow over the next two decades. There is also good reason to question the affordability of the Department of Defense’s (DoD’s) current long-term defense plan. If it is not affordable, DoD will have to consider, as it has in the past, a range of options for eliminating this mismatch between likely future budget levels and the cost of implementing its existing long-term plans.

## FUTURE FUNDING LEVELS FOR DEFENSE

There is no way to predict confidently what will happen to defense spending over the next two decades. However, the Bush Administration's latest Future Years Defense Program (FYDP), an analysis of past defense spending trends and patterns, and consideration of the long-term fiscal challenges confronting the United States (linked especially to rising health care costs and the aging of the US population), all seem to support the conclusion that the base defense budget is likely to stay relatively flat in real (inflation-adjusted) terms.

It is possible that some major change will occur in the strategic environment, the economy or some other factor, that will, instead, cause the base defense budget to be increased substantially in coming years. But it may be just as likely that the base defense budget will be cut in the future. Thus, for planning purposes it is probably prudent to assume that the base defense budget will remain, at best, relatively flat over the next decade or more.

It is even more difficult to project with any certainty what will happen to funding for military operations in coming years. So long as US forces remain heavily engaged in Iraq and Afghanistan, war-related funding requirements are likely to remain relatively high. On the other hand, to the extent US forces are withdrawn from those countries, it should be possible to reduce war-related funding.

## COST OF IMPLEMENTING THE CURRENT DEFENSE PLAN

At the most basic level, defense planning requires making decisions concerning three important characteristics of any military: its size, level of readiness and the effectiveness of its weapons and equipment. Funding requirements are also largely driven by these considerations. DoD's current long-term plan calls for: modestly increasing the size of the US military; maintaining relatively high readiness levels; and modernizing US forces in a broad range of areas. The Congressional Budget Office has estimated that — exclusive of war costs — implementing DoD's current long-term plan would require increasing the department's base budget from the requested 2009 level of about \$518 billion to an average of some \$535–575 billion annually over the next two decades.

The low-end (\$535 billion) estimate assumes that DoD would be able to hold down cost growth in both operations and support (O&S) activities and weapons acquisition programs far more successfully than it has been able to in the past. Conversely, the high-end (\$575 billion) estimate assumes that these costs would tend to increase, more in line with historical experience, beyond the levels projected by the Services.

The idea that DoD's base budget would have to be increased substantially to cover the full cost of the Services' long-term plans is also consistent with the view,

expressed by Army officials and others, that as US forces are withdrawn from Iraq and Afghanistan some of the supplemental funding provided for those operations — rather than being eliminated — should be shifted to DoD’s base budget.

If anything, historical cost and spending trends suggest that implementing DoD’s existing long-term plan might be even more costly than projected by CBO in its high-end estimate. As such, while it is possible that the Department of Defense (DoD) will be far more successful in controlling cost growth in the future than it has been in the past, for planning purposes, it is probably most prudent to assume that the cost of fully implementing the current defense plan would be at least as great as projected in CBO’s high-end estimate.

## RECONCILING THE PLANS-FUNDING MISMATCH

If it is likely that the base defense budget will remain relatively flat over the next two decades, but that executing the current defense plan would require a major, sustained increase in defense spending, then DoD suffers from a significant plans-funding mismatch. Reconciling this plans mismatch over the next two decades will require making some difficult choices. A wide variety of options, or combination of options, could be pursued in this effort. Based on the historical record, the following three options are among the most likely to be adopted by DoD.

- > **REDUCE THE SIZE OF THE US MILITARY:** The willingness of US military planners to trade off quantity for quality — specifically, to accept reductions in force size as the price of acquiring successive generations of new weapon systems that are typically far more capable, and costly, than the systems they are designed to replace — has been one of the most important constants in US defense policymaking and planning over the past 50 years. The decision to accept this tradeoff largely explains how the US military has been able to buy new weapon systems that typically have far higher Research and Development and unit procurement costs than their predecessors, and to man its forces with progressively higher quality and more costly personnel — all within a defense topline that has, over the long term, grown only relatively slowly. The Navy and Air Force are, to some extent, already moving down this path. Even a relatively modest reduction in force size might go far towards eliminating DoD’s prospective plans-funding mismatch.
- > **INTRODUCE NEW GENERATIONS OF WEAPON SYSTEMS LESS FREQUENTLY:** Another means DoD has often used to reconcile the acquisition of progressively more capable and costly next-generation weapon systems, and higher quality and more costly personnel, with a defense topline that typically grows — on an average annual basis — only relatively modestly, is to reduce substantially the frequency with which it introduces new weapon systems. Put differently, over time DoD has been willing to accept a substantial reduction in the frequency with which new weapon

Reconciling this plans mismatch over the next two decades will require making some difficult choices.

systems are introduced into service as one of the prices it must pay to sustain its traditional preference for acquiring increasingly more capable and costly weapon systems and employing progressively higher quality and more costly personnel. It could continue to make this tradeoff in the future.

- **ACCEPT AN OLDER WEAPONS INVENTORY:** Another way DoD has historically reconciled past plans-funding mismatches has been to keep weapon systems in service for longer periods of time. This tradeoff too has traditionally been a prominent feature of the US military's approach to modernization. For at least the past several decades, the US military has accepted increased equipment age as one of the prices it is often willing to pay in order to continue acquiring much more costly next-generation weapon systems.

Where new weapon systems provide significant improvements over their predecessors, for example, it may not be necessary to provide one-for-one replacements.

It may continue to make sense to make some or all of these kinds of tradeoffs in the future. Where new weapon systems provide significant improvements over their predecessors, for example, it may not be necessary to provide one-for-one replacements. Likewise, given the ability to retrofit even relatively old weapons platforms with modern sensors and other electronics, and equip them with advanced precision-guided munitions (PGMs), it may, in some cases, be possible to keep aircraft and other platforms in service for longer than projected in current plans.

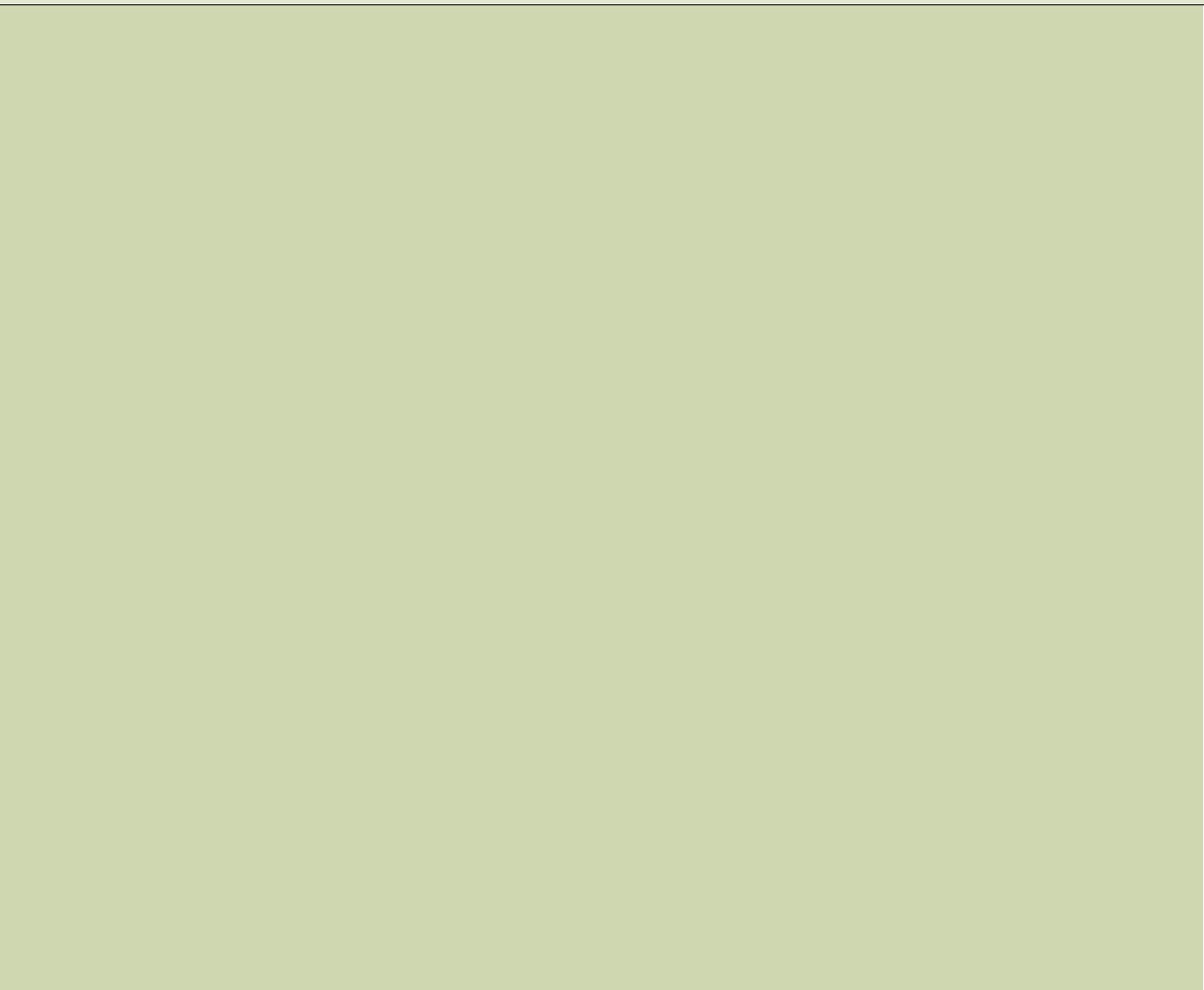
On the other hand, there are downsides to each of these approaches (e.g., operating costs sometimes increase as equipment ages). And, whatever the merits of these tradeoffs in the past, they may not, in all cases, be appropriate for the future. In some instances, for example, it may be important to retain or even expand force structure, or accelerate the introduction of new weapons systems. In those cases, less of a "business-as-usual" approach will need to be taken. Such an approach might include some combination of the following two options.

- **ACQUIRE LESS COSTLY WEAPON SYSTEMS:** In the commercial sector of the economy, successive generations of new products generally include at least modest improvements in capabilities and, often, reliability. Yet, they do not necessarily cost more to acquire. Indeed, in many commercial sectors, including, for example, electronics and computers, over the past several decades acquisition costs have declined at the same time that capabilities and reliability have improved – and, in the case of computers, improved dramatically. There is nothing to prevent US military planners from taking a similar approach when acquiring next-generation weapon systems. If the US military could better control – if not eliminate entirely – the dramatic cost growth that typically occurs in weapons acquisition programs, it could use the savings to facilitate the retention of larger forces, the more frequent introduction of new systems, and/or the maintenance of younger equipment inventories than would otherwise be possible.

> **TRANSFORM THE MILITARY:** Another innovative way the US military could try to reconcile the prospective plans-funding mismatch that it faces is by transforming itself. Military transformation is the act of combining new technologies, forms of organization and concepts of operations in order to create forces and capabilities that can manage existing or emerging challenges more effectively and, in particular, more cost-effectively than can existing kinds of forces. Past military transformations include, for example, the emergence of carrier-based aviation and combined-arms mechanized forces during World War II, and the nuclear weapons revolution. Among the candidates frequently mentioned for the future are space weapons, unmanned combat air systems (UCAS), other (e.g., ground- and under-water) unmanned systems, long-range precision-strike weapons of various types, and a range of improved C4ISR assets. If one or more of these candidates proves successful, it could have significant implications for the cost-effectiveness, and thus the budgetary requirements, of the US military. While it may be true that acquiring certain transformational forces or capabilities is costly, on balance, if they are truly transformational, those forces and capabilities will be more cost-effective, and often dramatically more cost-effective than the systems and capabilities they displace.

Some observers will view one or more of these responses as prudent and appropriate, while others will find all of them problematic. Those in this first category may conclude that much, or perhaps all, of DoD's projected plans-funding mismatch could be eliminated by modifying existing plans. Conversely, those in the latter category are likely to conclude that—as difficult as it may be, given historical trends and competing federal priorities—the only satisfactory way of eliminating this gap would be to increase substantially the level of funding provided for defense over the next two decades.

Another innovative way the US military could try to reconcile the prospective plans-funding mismatch that it faces is by transforming itself.



## INTRODUCTION

The goal of this report is to provide a budgetary framework and budget-related insights for the next administration and Congress, Department of Defense (DoD) planners and other policymakers as they attempt to develop and implement a long-term defense plan that will effectively and affordably meet US security requirements. Its objective is, for the most part, to raise the level of debate rather than to offer specific recommendations. However, it is hoped that the observations contained in this report will help generate better policymaking and programmatic decisions, and will leave the reader in a better position to evaluate the merits of various proposals for reshaping the US military.

The planning horizon considered in this report is the next 20 years, roughly the 2009–28 timeframe. This is far enough out into the future to capture many of the key strategic, programmatic and budgetary challenges and opportunities that the US military will face in coming years, but not so far into the future as to make the discussion too speculative to be useful. It is also consistent with the time horizon DoD traditionally focuses on in its Quadrennial Defense Review (QDR)—the Congressionally-mandated study of DoD’s long-term strategy, plans and requirements conducted by the department every four years.

Chapter I of this report discusses the prospects for defense spending over the next two decades. Policymakers and planners need to operate with realistic assumptions about the level of resources they can draw from, if they are to plan and budget efficiently and effectively. There is, of course, no way to predict with confidence precisely how much funding will be available for defense in the future. But an examination of current budget proposals, historical budget trends and the long-term fiscal outlook of the United States can shed some light on the question. This chapter provides such an examination.

Chapter II contains a brief description of DoD’s long-term defense plan and an estimate of the likely cost of implementing that plan. It includes a discussion of DoD and

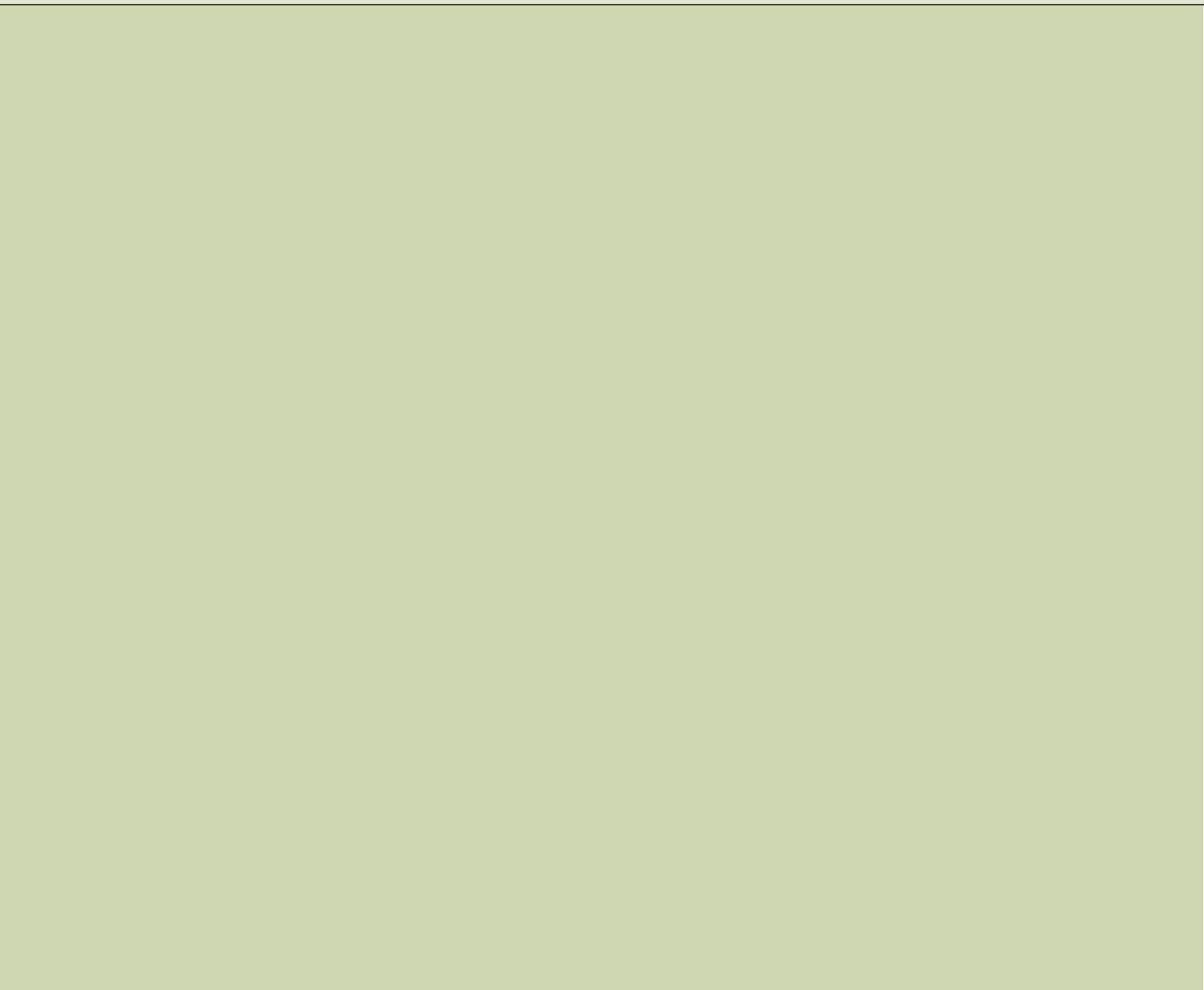
**The planning horizon considered in this report is the next 20 years, roughly the 2009–28 timeframe.**

Congressional Budget Office (CBO) cost estimates, as well as historical cost trends in various areas of the defense budget—including both weapons acquisition programs and operations and support (O&S) activities—that are likely to lead to significant growth in the cost of DoD’s long-term plan.

Taken together, the first two chapters of this report suggest that, as in the past, DoD may confront a significant mismatch between the level of funding likely to be available for defense over the next two decades and the cost of implementing DoD’s long-term force structure, readiness and modernization plans. Chapter III provides an introduction to the various ways DoD planners and policymakers might, in theory, respond to the pressures caused by this prospective plans-funding mismatch.

These options include, for example, reducing the size of the US military, accepting an older weapons inventory, introducing new-generations of weapons more slowly, acquiring less costly weapon systems, and reshaping or transforming the US military. All of these options have been used to varying degrees in the past. The discussion in this chapter is designed to help the reader think through which, if any, of these options it might be appropriate to embrace in the future.





## CHAPTER 1 > FUTURE FUNDING LEVELS FOR DEFENSE

The Bush Administration has requested \$611 billion for national defense in fiscal year 2009.<sup>1</sup> This includes \$541 billion for the “base” defense budget — \$518 billion for the Department of Defense, and \$23 billion for Department of Energy and other defense-related activities. The base defense budget is intended to cover the military’s long-term — essentially peace-time — force structure, readiness and modernization costs. If approved, the 2009 request would bring the base defense budget to its highest level ever, in real (inflation-adjusted) terms.<sup>2</sup>

In addition, the 2009 request includes \$66 billion in emergency supplemental appropriations for defense, as a partial down-payment on 2009 war-related costs.<sup>3</sup> Eventually, additional 2009 funding — of at least tens of billions of dollars — will have to be provided to cover war-related costs for the full year.

The 2008 defense budget is the highest defense budget since the end of World War II (see Figure 1). Depending on how much funding is ultimately provided for military operations, it is possible that the defense budget for 2009 (i.e., including the base budget plus war-related funding) will end up exceeding the 2008 defense budget. Even if no more funding, beyond the \$66 billion already requested (and approved) is provided for military operations, the total request for 2009 would surpass

If approved, the 2009 request would bring the base defense budget to its highest level ever, in real (inflation-adjusted) terms.

---

<sup>1</sup> Unless otherwise noted, all years cited in this analysis represent fiscal years. The federal government’s fiscal year runs from October 1 through September 30.

<sup>2</sup> Unless otherwise noted, all funding changes cited in this analysis are expressed in real terms.

<sup>3</sup> This emergency request was enacted at the end of June 2008. The same measure also provides about \$100 billion in emergency funding for military operations in 2008, bringing the total for 2008 to some \$187 billion. (Congress had already approved \$87 billion in 2008 war-related funding at the end of 2007.)

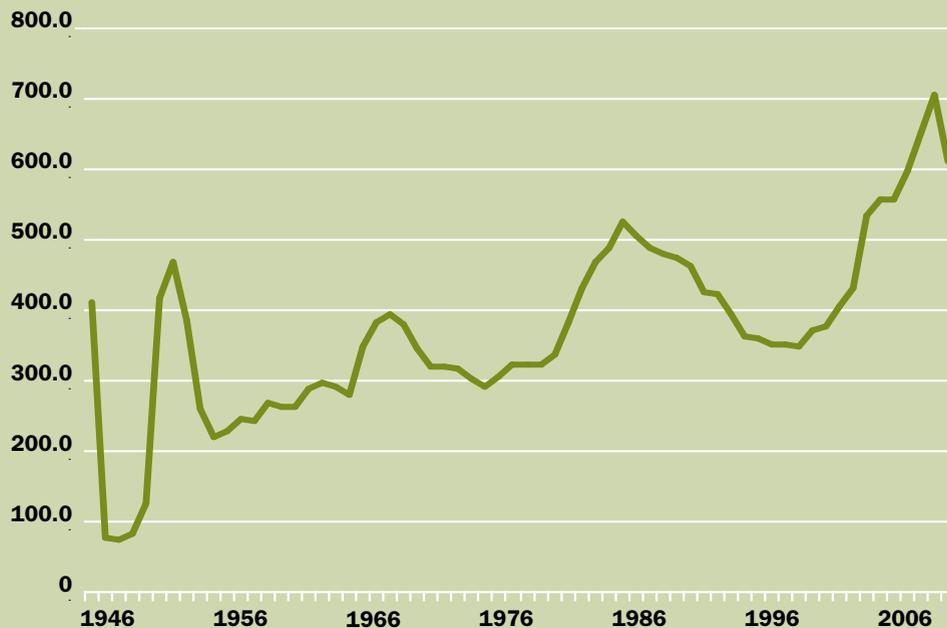
the peak years of the Korean and Vietnam Wars by, respectively, some \$140 billion and \$210 billion dollars (in fiscal year 2009 dollars).<sup>4</sup>

The current high levels of funding for defense are the product of a dramatic build-up that began, in earnest, after the terrorist attacks of September 11, 2001. The 2009 defense budget request is about 62 percent higher in real terms than the 2000 defense budget. Nor is this growth due simply—or even primarily—to the cost of military operations. The base defense budget has also grown dramatically over the past eight years. The 2009 request for the base defense budget is some 43 percent higher than the 2000 defense budget (see Figure 2).

Although defense spending is presently at historically very high levels, as a share of the economy it is at relatively low levels. At the height of the Korean and Vietnam

<sup>4</sup> Unless otherwise noted, all budget figures cited in this analysis are expressed in fiscal year 2009 dollars. Historical and projected future budget levels have been converted into 2009 dollars using the gross domestic product (GDP) deflator.

**FIGURE 1. FUNDING FOR NATIONAL DEFENSE, 1946–2009\***  
(BUDGET AUTHORITY IN BILLIONS OF 2009 DOLLARS)



Source: CSBA based on OMB data.

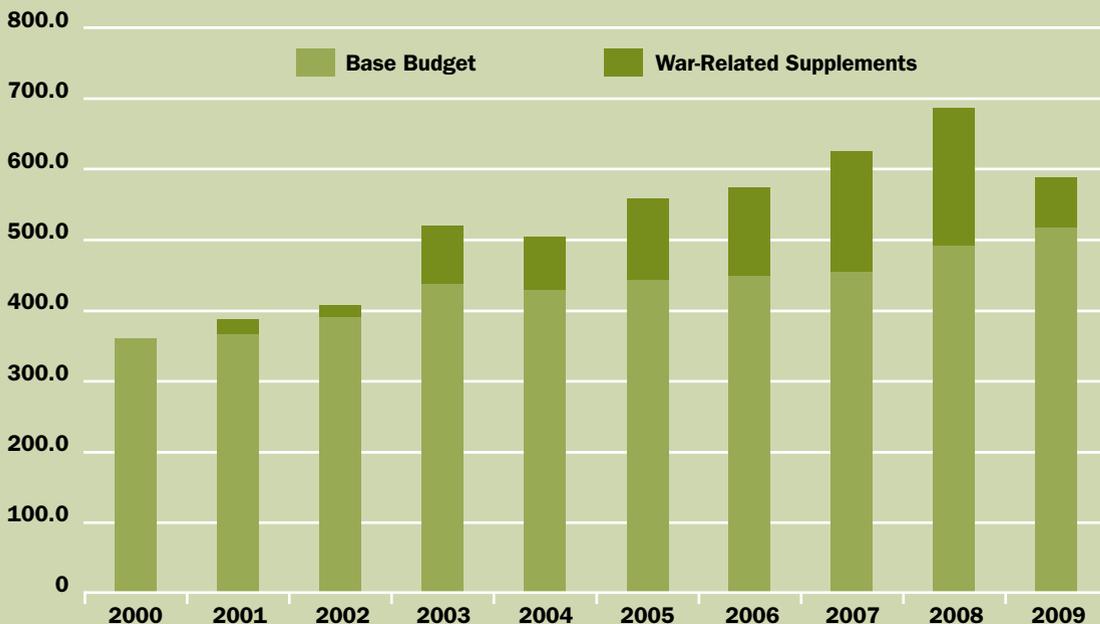
\* 2008 and 2009 figures assume enactment of the administration's pending requests for war-related supplemental appropriations. The level projected for 2009 almost certainly understates the amount of funding that will be provided, since it includes only partial-year funding for military operations.

Wars, for example, defense spending absorbed, respectively, about 14.2 and 9.4 percent of gross domestic product (GDP). By comparison, for 2009, defense is likely to account for under 5 percent of GDP.<sup>5</sup> Defense has declined as a share of GDP even as it has increased in dollar terms because, over time, the US economy has grown faster than defense spending — the US economy is today, for example, some six-times larger than it was during the Korean War and three-times larger than during the Vietnam War.

Prior to the terrorist attacks of September 11, 2001, few observers would have guessed that US defense spending was about to enter a period of sustained and substantial growth. Likewise, there is no way we can predict with high confidence what

<sup>5</sup> Based on the administration's 2009 request as it stands today (i.e., including only partial funding for military operations) defense spending would account for about 4.4 percent of GDP. However, the share of GDP allocated to defense could approach 5 percent if the amount of war funding provided for the year reaches the level requested for 2008.

**FIGURE 2. DOD BASE AND SUPPLEMENTAL FUNDING, 2000-09\***  
(BUDGET AUTHORITY IN BILLIONS OF 2009 DOLLARS)



Source: CSBA based on DoD and CRS data.

\* 2008 and 2009 figures assume enactment of the administration's pending requests for war-related supplemental appropriations. The level projected for 2009 almost certainly understates the amount of funding that will be provided, since it includes only partial-year funding for military operations.

**As in the past,  
the level of funding  
the United States  
allocates to defense  
will depend upon  
a wide range  
of factors.**

will happen to US defense spending over the next two decades. As in the past, the level of funding the United States allocates to defense will depend upon a wide range of factors. These factors include: the nature and magnitude of the military challenges to US security; the efficiency with which the US military is able to counter those challenges; the level of support provided by allies; the perceived importance of non-defense priorities, such as homeland security, tax cuts, Social Security, Medicare and other domestic programs; the state of the US economy; and the degree of national security risk we are willing to accept. Since trends in these other areas cannot be predicted with high confidence, not surprisingly, neither can the likely level of funding for defense.

That said, what limited evidence is available suggests that, for planning purposes, it may be prudent to assume that overall defense spending, and especially the base defense budget, will remain relatively flat over the next two decades. This evidence includes: first, the Bush Administration's own plans for the base defense budget through 2013 (the last year of the DoD's Future Years Defense Program, or FYDP); second, an analysis of historical funding trends for the base defense budget; and, third, consideration of future budget pressures caused by current tax and entitlement policies, and especially the projected retirement of the baby boomer generation and rising healthcare costs. These three factors, and what they may suggest about future funding levels for the base defense budget, are discussed below. Following this discussion, consideration is given to how much additional spending might be required in coming years to pay for military operations.

## **BASE BUDGET FUNDING IN THE FYDP**

The FYDP released in February 2008, shows funding in DoD's base budget growing to \$518 billion in 2009, but then declining very slightly (by a total of about 1.5 percent) over the following four years. In other words, the Bush Administration's own plan projects that, at least over the medium term, DoD's base budget will remain basically flat. The FYDP includes no funding for military operations.

## **BASE BUDGET HISTORICAL TRENDS**

The Defense Department's base budget would be projected to average about \$515 billion a year over the next two decades, based on simple linear regression analysis of annual funding levels over the past 55 years.<sup>6</sup> As with the latest FYDP's projection, this is consistent with the view that funding for defense is likely to stay essentially flat in coming years. However, the trend line that generates this projection is only weakly correlated with the historical data upon which it is based. In any event, such a

---

<sup>6</sup> Because of data limitations, it is difficult to track DoD's base budget (vice total budget) prior to the end of the Korean War (55 years ago).

mechanical and deterministic approach to projecting future defense spending levels may be of limited usefulness.

A better approach to using historical budget data to gain insights into future defense spending levels may be to consider not only the data itself but the context in which past patterns and trends have emerged. In particular, an examination of the history and dynamics of past defense buildups may offer some useful insights. Prior to the most recent buildup, begun in the late 1990s and greatly accelerated after 9/11, DoD's base budget had witnessed two major increases in funding over the past half century. The first of those was triggered by the Korean War and lasted only a couple of years. Between 1950 and 1952, DoD's budget nearly quadrupled, with this additional funding being used both to cover the cost of the Korean War and to pay for a general buildup in US forces (i.e., base budget programs and activities). The Korean War ended in 1953, and by 1954 DoD's base budget had settled at some \$231 billion. This was more than double the level of 1950. However, this brief, steep buildup in DoD's base budget was followed by a relatively long period of sustained, but modest, growth in DoD's budget. Between 1954 and 1980, DoD's base budget increased at an average annual rate of about 1.5 percent. In essence, the boost to DoD's base budget provided during the Korean War reflected the shift to a new Cold War paradigm for defense spending—the period of dramatic growth was brief, but the shift left DoD's base budget, permanently, on a much higher plane.

The second major boost in DoD's base budget was the Reagan Administration buildup of the first half of the 1980s.<sup>7</sup> This saw DoD's base budget increased by some 53 percent over five years, between 1980 and 1985. In contrast to the Korean War buildup, this boost in funding for defense was followed by a period of significant decline, rather than a sustained period of modest growth. Between 1985 and 1998, DoD's base budget was cut by some 35 percent. This period of decline appears to have been driven primarily by two factors: first, the end of the Cold War and the collapse of the Soviet Union; and, second, a desire to reduce the federal deficit and, ultimately, balance the federal budget.

These two examples of past buildups in DoD's base budget suggest two tentative hypotheses about the current buildup. First, it is likely to be over soon. As noted above, the Korean War and Reagan-era buildups were both completed over relatively short periods, about three years in the former case and five years in the latter. By this standard, the current buildup—which began in earnest in 2002—is already quite long.

The second hypothesis suggested by these two past examples is that the current buildup is likely to be followed by a sustained period of, at best, modest growth in DoD's base budget and, possibly, significant decline. Absent a triggering event comparable in magnitude to the collapse of the Soviet Union, it may be more likely

---

<sup>7</sup> Overall funding for defense increased significantly during the Vietnam War. However, that increase was due entirely to growth in war-related funding. DoD's base budget stayed essentially flat during the years of US military involvement in Southeast Asia.

that the next two decades will resemble the period of modest growth that followed the Korean War than the period of deep decline that followed the Reagan-era buildup. This would be consistent with the view that, like the Korean War buildup, the current buildup in the base defense budget reflects the emergence of a new strategic paradigm — with long-term implications for defense spending levels. However, based on historical precedent, it is difficult to rule out entirely the possibility that some reductions will be made in coming years even absent a major change in the strategic environment — after all, the first five years of the post-1985 decline in DoD’s base budget occurred prior to the collapse of the Soviet Union.

It is worth reiterating that these represent only tentative hypotheses. They certainly do not prove either that the current buildup is nearing its end, or that additional large increases in the base defense budget will not be forthcoming over the next two decades. Nor could they provide such proof — given the future’s inherent unpredictability and the myriad factors likely to affect future defense funding levels. The point of the discussion above is simply to point out that — to the extent past trends in DoD’s base defense budget suggest anything about future funding levels — the fairest reading of those trends would seem to be that DoD’s base budget is likely to remain relatively flat over the next two decades.

## THE LONG-TERM FISCAL OUTLOOK AND THE BASE DEFENSE BUDGET

In attempting to estimate how much funding is likely to be provided for defense in coming years, it may also be helpful to consider the overall fiscal outlook for the United States. In the aftermath of the terrorist attacks of September 11, 2001, defense spending became a higher priority for most Americans, especially as it relates to homeland security and combating terrorism, but it is still far from the only priority. Over the long term, the defense mission will have to compete — as it has in the past — with other national priorities, including holding down or cutting taxes; reducing the federal debt; ensuring the health and durability of Social Security, Medicare and Medicaid; and providing greater resources for education, health research and other domestic programs.

As the discussion below will make clear, the nation’s long-term fiscal outlook is, at best, troubling. Current federal revenue and spending policies are not sustainable over the long term. Placing those policies on a sustainable path will likely require both increasing revenues and scaling back projected spending levels. In such a budgetary environment, it may be difficult for DoD to maintain even a flat base budget over the next two decades.

The long-term federal budget picture has dramatically worsened over the past seven years. In early 2001, CBO projected a 10-year surplus of about \$5.6 trillion (current

**Current federal revenue and spending policies are not sustainable over the long term.**

dollars) over the 2002–11 period in its baseline estimate.<sup>8</sup> By contrast, CBO’s baseline estimate now projects surpluses totaling only \$274 billion (current dollars) over the next decade (2009–18).<sup>9</sup> The change in the government’s fiscal outlook has resulted from the enactment of large tax cuts, the expansion of Medicare (to include a prescription drug benefit), increased defense and homeland security spending, and other factors.

Unfortunately, it is likely that the outlook will deteriorate still further in coming years. In its most recent budget request, in addition to requesting further increases in funding for defense and homeland security programs, the administration has proposed making permanent a number of tax cuts enacted over the past six years (rather than having them expire in 2010, as they would under current law). According to CBO, enactment of the President’s proposed budget would push total federal deficits to some \$717 billion (current dollars) over the 2009–18 period, and keep the government in the red through the entire decade.<sup>10</sup>

Worse yet, this estimate almost certainly understates the actual cost of the administration’s proposals. Among other things, the CBO estimate of the President’s proposed budget does not include future costs associated with the war in Iraq and other military operations, or the cost of extending relief from the Alternative Minimum Tax (AMT).<sup>11</sup> The administration’s plan also assumes that spending on domestic discretionary programs will be cut substantially. Projections based on more realistic assumptions about revenue and spending suggest that total deficits could total some \$3–4 trillion (current dollars) or more over the next 10 years.<sup>12</sup>

As bad as the deficit picture appears to be for the coming decade, the outlook for the years beyond 2018 is far worse. The Bush Administration’s own budget documents project that the federal government will run deficits continuously after around 2020 and that the size of the deficit will grow to some 10.9 percent of GDP by 2080.<sup>13</sup> However, the administration’s projections incorporate a number of optimistic and, if history is any guide, probably unrealistic assumptions about future revenue and spending levels.

As bad as the deficit picture appears to be for the coming decade, the outlook for the years beyond 2018 is far worse.

<sup>8</sup> CBO, *The Budget and Fiscal Outlook: Fiscal Years 2002–2011* (Washington, DC: CBO, January 2001), p. 2.

<sup>9</sup> Ibid.

<sup>10</sup> Peter R. Orszag, Director of CBO, *Analysis of the President’s FY 2009 Budget Request*, letter to the Honorable Robert C. Byrd, Chairman, Senate Appropriations Committee, March 3, 2008, p. 11.

<sup>11</sup> Since, unlike the regular income tax code, the AMT is not indexed to inflation, unless relief is provided the number of taxpayers that would be subject to the AMT would grow from about two million today to some 39 million by 2012. There is strong bipartisan support for reforming the AMT.

<sup>12</sup> For example, according to CBO, the combination of increasing discretionary spending at the rate of growth of GDP and reforming the AMT would increase deficit totals for the decade projected in its baseline estimate by \$2.6 trillion. CBO, *The Budget and Economic Outlook: Fiscal Years 2008 to 2018* (Washington, DC: CBO, January 2008), p. 12.

<sup>13</sup> OMB, *Fiscal Year 2009 Budget of the US Government, Analytical Perspectives* (Washington, DC: GPO, February 4, 2008), p. 188.

In 2007, the Center on Budget and Policy Priorities (CBPP) released a study of the long-term fiscal outlook that incorporated more realistic assumptions.<sup>14</sup> This assessment, which was based primarily on data and projections contained in Congressional Budget Office (CBO) analyses, concluded that if current budget policies are continued, federal deficits will grow dramatically from about 2 percent of gross domestic product (GDP) in 2017 to 7 percent of GDP in 2030 and 20 percent of GDP in 2050 (see Figure 3).<sup>15</sup> These estimates are very similar to the projections made by the Government Accountability Office (GAO) in a report it also released in 2007.<sup>16</sup> If anything, the GAO report suggests that the long-term fiscal outlook may be even bleaker than the CBPP analysis indicates.<sup>17</sup>

The assumptions that underlay CBPP's projections are relatively conservative and very consistent with long-term spending and cost trends. Specifically, those projections assume that after 2017:

- > Social Security costs will grow as projected by CBO.
- > Medicare and Medicaid costs will increase at the same rate per beneficiary as they have historically (since the 1960s).
- > Taken as a whole, defense and non-defense (discretionary and entitlement) programs *other than* Social Security, Medicare and Medicaid will grow at the same rate as the US population plus inflation.<sup>18</sup> (This is very close to what has happened to such spending over the past 30 years.)
- > Consistent with current policies (though not current law), the tax cuts enacted in 2001 and 2003 and relief from the AMT will be permanently extended.

<sup>14</sup> Richard Kogan, Matt Fiedler, Aviva Aron-Dine and James Horney, "The Long-Term Fiscal Outlook is Bleak: Restoring Fiscal Sustainability Will Require Major Changes to Programs, Revenues, and the Nation's Health Care System," CBPP, January 29, 2007.

<sup>15</sup> *Ibid.*, p. 2.

<sup>16</sup> David M. Walker, Comptroller General of the United States, "Long-Term Budget Outlook: Deficits Matter—Saving Our Future Requires Tough Choices Today," Statement before the House Budget Committee, January 23, 2007, p. 7.

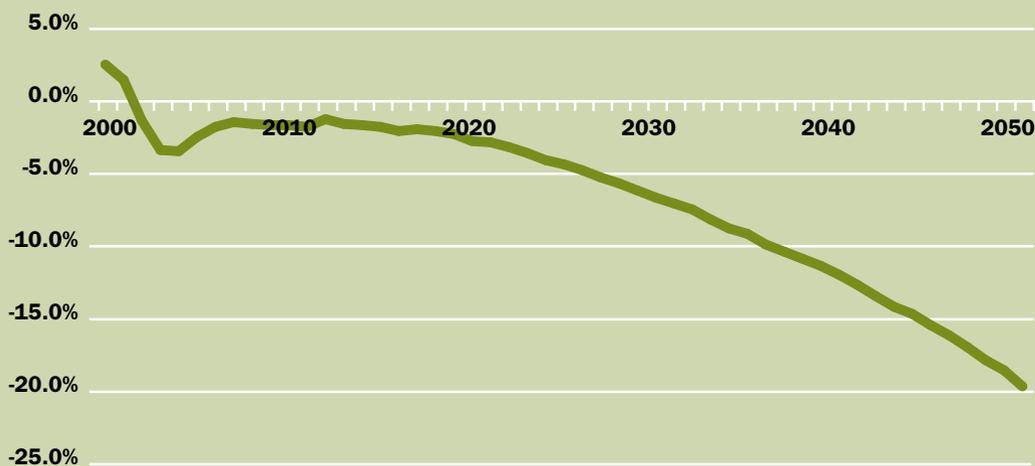
<sup>17</sup> The GAO analysis examined two scenarios. In its 'baseline extended' scenario, it projected that the federal deficit would reach 6 percent of GDP by 2030 and 18 percent of GDP by 2050. In the second, more pessimistic, scenario, it projected that deficits would reach 14 percent of GDP by 2030 and 20 percent of GDP by about 2036. *Ibid.*

<sup>18</sup> The discretionary portion of the budget funds programs and activities for which Congress must annually approve appropriations. Nearly all defense spending is discretionary, as is spending on many non-defense programs and activities, such as homeland security and foreign affairs, as well as a broad range of domestic programs (e.g., transportation, education and health research). By contrast, entitlements are a form of mandatory spending. The costs of such programs are paid to eligible beneficiaries by the federal government essentially automatically. Taken together, Social Security, Medicare and Medicaid currently account for about three-quarters of entitlement spending.

The main drivers of the worsening deficit picture after 2017 are changing demographics—specifically the growing share of the US population projected to be elderly—and, especially, rising healthcare costs. Reflecting these dynamics, the growth in federal spending as a share of GDP projected in the CBPP model is due entirely to increases in three entitlement programs: Social Security, Medicare and Medicaid. As noted above, taken as a whole, spending on all other federal programs—including defense—is assumed to increase at the same rate as the US population plus inflation. Since the US economy is projected to grow more rapidly than the US population, this means that (consistent with historical trends) the share of GDP absorbed by all other federal programs is projected, in the CBPP model, to decline significantly in the coming decades—dropping from about 8 percent today to 7 percent by 2030 and 6 percent by 2050.

By contrast, spending on Social Security, Medicare and Medicaid is projected to increase from about 9 percent of GDP today to 14 percent by 2030 and 22 percent by 2050. As a result of the retirement of the baby boomer generation, which will begin over the next few years, and the low US birth rate of recent decades, which is projected to continue in the future, the elderly share of the US population is projected to increase

**FIGURE 3. PROJECTED DEFICITS UNDER CURRENT POLICIES**  
(SURPLUS/DEFICIT AS PERCENTAGE OF GDP)



Source: Center on Budget and Policy Priorities (CBPP), January 2007.

significantly in coming decades.<sup>19</sup> Today, there are nearly five adult Americans 20–64 years of age for every American over 65. According to CBO, by 2020 the ratio will drop to about 3.8-to-1 and by 2030 it will fall to some 2.8-to-1.<sup>20</sup> And it is projected to remain at essentially that level through 2050, the end of the forecast period.

Between now and 2050, the share of GDP absorbed by Social Security is projected to increase from some 4 percent to 6 percent — with all of that growth resulting from the changing demographics noted above. No increases beyond this are projected because Social Security spending per beneficiary is not projected to grow any faster than the economy. The projected growth in the Medicare and Medicaid programs is much greater. Between now and 2050, spending on these two programs (combined) is projected to increase from about 5 percent of GDP to 15 percent.

The reason this projected increase is so much greater than that forecast for Social Security is because, in this case, not only is the beneficiary population projected to increase, but the costs per beneficiary are projected to grow, as they have historically, at an annual rate 2-3 percent faster than the US economy. This growth is caused by essentially the same factors — such as increased technology utilization — that have led to roughly the same rates of per capita cost growth in the broader US healthcare system, and are projected to continue to drive those costs in coming decades.

If allowed to materialize, the large, persistent and growing deficits projected to emerge over the next 50 years could seriously damage the US economy. With the federal government borrowing so much money to finance its deficits, interest rates would rise and the private investment needed to grow the economy could be crowded out. CBO has estimated that if federal deficits of the magnitude noted above were to emerge, by 2050 US per capita GDP could be 25 percent lower than it would be if the budget were balanced.<sup>21</sup> Moreover, notwithstanding the long-term nature of the fiscal challenges facing the United States, it is possible that the US economy could be affected much sooner.

A 2004 study by former Treasury Secretary Robert Rubin, Peter Orszag (now director of CBO) and Wall Street Economist Allen Sinai concluded that “the adverse consequences of sustained large budget deficits may well be larger and occur more suddenly than traditional analysis suggests.”<sup>22</sup> The authors suggest that “substantial deficits projected far into the future can cause a fundamental shift in market

If allowed to materialize, the large, persistent and growing deficits projected to emerge over the next 50 years could seriously damage the US economy.

<sup>19</sup> The US birthrate has declined from about 3.5 percent in 1950 to 2 percent today. It is projected to remain at essentially that same level through 2050. As a result, the shift toward a more elderly US population is projected to be essentially permanent and not a temporary phenomenon that will end with the eventual passing of the baby boomer generation.

<sup>20</sup> CBO, *Global Population Aging in the 21st Century and Its Economic Implications* (Washington, DC: CBO, December 2005), p. 9.

<sup>21</sup> Peter R. Orszag, CBO Director, “The Long-Term Budget Outlook,” Statement before the House Budget Committee, December 13, 2007. This estimate is based on the assumption that the federal deficit would reach 22.5 percent of GDP by 2050.

<sup>22</sup> Robert E. Rubin, Peter R. Orszag and Allen Sinai, “Sustained Budget Deficits: Longer-Run US Economic Performance and the Risk of Financial and Fiscal Disarray,” January 4, 2004, p. 1.

expectations and a related loss of confidence at home and abroad.”<sup>23</sup> In turn, this “can generate a self-reinforcing negative cycle among the underlying fiscal deficit, financial markets, and the real economy.”<sup>24</sup> The existence of persistent, large deficits would also profoundly constrain the ability of the federal government to respond to new challenges or pursue new priorities—since by 2050 simply covering interest costs on the federal debt would consume over half of projected annual federal revenues.<sup>25</sup>

In order to avoid the potentially dangerous consequences to the economy and the federal budget of running continuously large and growing deficits, efforts will, it is hoped, be made to change current policies and place the federal budget on a more sustainable path. As noted earlier, the projected increase in the size of the deficit as a share of GDP is being driven entirely by growth in just three programs, Social Security, Medicare and Medicaid—with the latter two programs being responsible for the vast majority of the projected growth. Thus, constraining growth in those two programs will be critical to any serious effort to address the deficit problem. In turn, since growth in the per capita costs of these programs is being driven by the same factors that are causing comparable cost growth in the broader healthcare system (e.g., among private insurance plans), addressing effectively the projected explosion in federal debt will, likewise, require improving the affordability of US healthcare more generally.

While fixing the US healthcare system may be the key to solving, or at least substantially mitigating, the long-term fiscal crisis facing the United States, it is unlikely to be the only element of a successful effort to address this challenge. Effectively reforming the US healthcare system will undoubtedly prove difficult. Moreover, strong political support exists for Social Security, Medicare and Medicaid—and, if anything, that support is likely to increase as the US population ages. As result, it seems likely that tax increases and cuts to other federal programs—or, at least, slower rates of growth in those programs—will also be part of the solution.

Both tax increases and cuts to discretionary programs, and especially defense, were key elements of the deficit reduction efforts begun in the mid 1980s and continued into the 1990s. These efforts led, ultimately, to the balanced budgets of 1998-2001. Absent an improvement in the US security environment comparable to the end of the Cold War, there may be little reason to believe that defense will be cut as deeply as it was during this earlier period of deficit reduction. On the other hand, given the strong political support that exists for Social Security, Medicare, Medicaid and other domestic programs, as well as for holding down taxes, it would probably be prudent to assume that any such effort would include at least some modest restraint on defense spending.

Both tax increases and cuts to discretionary programs, and especially defense, were key elements of the deficit reduction efforts begun in the mid 1980s and continued into the 1990s.

---

<sup>23</sup> Ibid.

<sup>24</sup> Ibid.

<sup>25</sup> Kogan et al, “The Long-Term Fiscal Outlook is Bleak,” p. 2.

Just how much restraint might be imposed on defense spending is, of course, impossible to predict. However, since the CBPP model already assumes that, consistent with the historical record, overall spending on federal programs other than the “big three” entitlements would increase only relatively modestly — at the same rate as the US population plus inflation, and more slowly than the US economy — a reasonable guess might be that in the case of a serious deficit reduction effort such spending would, at best, be kept essentially flat in real terms.

In considering long-term projections of the fiscal outlook, it is important to acknowledge that a significant amount of uncertainty surrounds any assessment that attempts to project revenue and spending levels so far into the future. Among other things, small differences in growth rates can, over extended periods of time, lead to large differences in overall program costs. For example, according to the Office of Management and Budget (OMB), lowering the per capita growth rate projected for Medicare over the long run by just a quarter of a percentage point would cause the share of GDP absorbed by the deficit to be some 2 percentage points lower in 2050 than it would otherwise be.<sup>26</sup> Small changes in assumptions about immigration, productivity, fertility, and other factors could — because of the compounding effect of even small changes over time — have similarly large effects on long-term deficit projections.

However, there is little reason to take comfort in this uncertainty. It appears to be at least as likely that the assumptions incorporated into the CBPP’s projections are overly optimistic as it is that they are overly pessimistic. As noted earlier, the GAO has suggested that the long-term fiscal outlook may actually be substantially worse, and even the Bush Administration’s own projections, which generally incorporate more optimistic assumptions, project that the federal deficit will increase substantially, to unprecedented levels, over the next several decades. As David M. Walker, Comptroller General of the United States has noted: “While there is always some uncertainty in long-term projections, two things are certain: the population is aging and the baby boomer generation is nearing retirement age.”<sup>27</sup> And the country’s “aging population and rising healthcare spending will have significant implications not only for the budget but also the economy as a whole.”<sup>28</sup>

It could also be argued that, even if a major deficit reduction effort will eventually need to be made, it may not be made over the next two decades. Far from addressing effectively the long-term fiscal challenge confronting the United States, since 2001 at least, the administration and Congress have taken a range of steps — including cutting taxes, expanding Medicare and dramatically increasing defense and homeland security spending — that have significantly exacerbated those challenges. It is certainly possible that future administrations and Congresses will continue to delay action on addressing the deficit until beyond the 2028 timeframe. However, there are several

---

<sup>26</sup> OMB, *Analytical Perspectives*, p. 189.

<sup>27</sup> Walker, “Long-Term Budget Outlook,” p. 10.

<sup>28</sup> *Ibid.*

reasons to think that serious efforts at deficit reduction will, in fact, begin over the next two decades.

One reason is that the magnitude of reductions in federal programs and increases in taxes that would have to be implemented to avert the projected fiscal crisis would be substantially less draconian if made sooner, rather than later.<sup>29</sup> Another reason is that the period of sustained growth in the federal deficit projected by the CBPP model and others will be gathering substantial momentum over the next two decades—absent policy changes, large, persistent and growing deficits will move from being abstract projections to realities over this period.<sup>30</sup> Finally, as noted earlier, while current projections show the worst of the deficit challenge manifesting itself in the years beyond 2028, the prospect of such large deficits could trigger a financial and economic crisis in the near term—forcing US policymakers to take action.

If, despite these considerations, serious efforts are not made to address the growing federal deficit over the next twenty years, defense and other federal spending may gain a short-term reprieve. However, a failure to address the deficit challenge over this period will inevitably leave the United States with a far more intractable problem to deal with thereafter. At that point, averting the projected mushrooming of the federal deficit would likely require implementing both deep cuts in spending and significant tax increases. History suggests that this would probably include making significant cuts in the defense budget. In any case, even assuming that no efforts were made to address the long-term deficit challenge over the next two decades, as discussed earlier, the best available evidence would seem to suggest that the base defense budget would be likely to grow at only a relatively modest pace over this period.

## FUTURE PROSPECTS FOR DEFENSE SPENDING

As noted at the outset of this chapter, there is no way to confidently predict what will happen to defense spending over the next two decades. The size of the defense budget depends on too many strategic, economic, political and other factors, all of which are imbued with substantial uncertainty, for one to make more than a rough, educated guess about where defense spending is headed. Bearing that limitation in mind, the evidence discussed in this chapter seems to suggest that—absent a major change in the strategic

---

<sup>29</sup> Ibid.

<sup>30</sup> Tax increases or program cuts implemented today would have an immediate impact on the size of the federal debt. And a lower debt would, in turn, result in lower interest costs for every year through 2050, bringing the “miracle of compound interest” to bear. As a result of this “virtuous cycle,” CBPP estimates that if the United States were to immediately make permanent tax increases or program cuts equivalent to 3.2 percent of GDP the size of the federal debt projected for 2050 would fall from 231 percent of GDP to 37 percent—roughly today’s level—and leave the annual federal deficit also at roughly today’s level. Conversely, if these policy changes are deferred, much larger tax increases or program cuts would eventually have to be made—since, in this case, the compounding effect of interest results in a “vicious circle” that causes the federal debt, and thus annual deficits, to grow. Kogan et al, “The Long-Term Fiscal Outlook is Bleak,” p. 2.

environment, the economy or some other factor—the base defense budget is likely to stay relatively flat over the next two decades. To the extent they suggest anything about future funding levels for defense, the latest FYDP, an analysis of past defense spending trends and patterns, and consideration of the long-term fiscal challenges confronting the United States, to varying degrees, all seem to support this conclusion.

If this is the case, the share of GDP allocated to defense would be projected to decline over the next two decades. Defense is likely to absorb some 4.5–5.0 percent of GDP in 2009, including 3.7 percent for the base defense budget.<sup>31</sup> Assuming, consistent with CBO estimates, that the economy would grow at a real average annual rate of some 2.5 percent over the long run,<sup>32</sup> if the base defense budget were to remain flat in real terms, the share of GDP absorbed by that budget would average roughly 3 percent of GDP over the next two decades, and would fall to some 2.3 percent of GDP by 2028.

The amount of money that is likely to be spent on military operations in the future is even more difficult to estimate with any confidence than future funding levels for the base defense budget.

## FUTURE SPENDING ON MILITARY OPERATIONS

The amount of money that is likely to be spent on military operations in the future is even more difficult to estimate with any confidence than future funding levels for the base defense budget. It seems reasonable, however, to assume that some additional funding will be allocated to such operations. Since 2001, Congress has appropriated a total of about \$931 billion (\$854 billion in current dollars) in emergency funding, primarily to cover the cost the wars in Iraq and Afghanistan. This consists of about \$870 billion for DoD and \$61 billion for other departments and agencies, and includes funding intended to cover costs through the beginning of 2009.<sup>33</sup> While it seems likely that US forces will remain engaged in these military operations on some level and for some period of time, there is great uncertainty concerning both the level and duration of that involvement.

CBO has estimated future funding requirements for military operations based on two possible scenarios.<sup>34</sup> The 2009–17 costs associated with these scenarios range

<sup>31</sup> The wars in Iraq and Afghanistan would account for the remaining portion of the 4.5–5.0 percent of GDP projected to be absorbed by defense in 2009. As noted earlier, it is unclear how much funding will ultimately be requested (and provided) for these military operations in 2009.

<sup>32</sup> CBO, *The Budget and Economic Outlook: Fiscal Years 2009 to 2018*, p. xv.

<sup>33</sup> These totals include all war-related funding enacted for 2001–2008, and \$67.4 billion approved (at the end of June 2008) as a down-payment on 2009 costs (including \$66 billion for DoD and \$1.4 billion for other departments and agencies).

<sup>34</sup> Under the first scenario, the number of US military personnel deployed in Iraq, Afghanistan and elsewhere related to the war on terrorism would decline from about 200,000 in 2008 to 30,000 by 2010, and would remain at that level through 2017. Under the second scenario, the number of troops would decline to 75,000 in 2013 and remain at that level through 2017. Peter Orszag, CBO Director, “Estimated Costs of US Operations in Iraq and Afghanistan and other Activities Related to the War on Terrorism,” testimony before the House Budget Committee, October 24, 2007, p. 10.

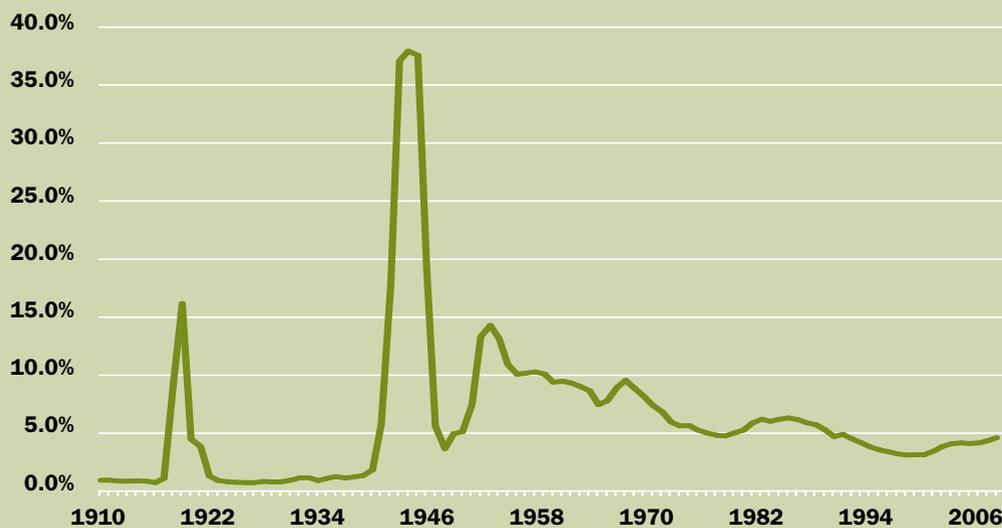
from about \$295 billion to \$740 billion, with those costs falling to \$25–60 billion annually by the end of this period.<sup>35</sup>

This is not meant to suggest that the US military will necessarily, or even likely, remain involved in Iraq or Afghanistan for the next 20 years. However, based on the historical record, it may be more likely than not that US forces will be engaged in military operations somewhere, at some level, even beyond 2017 (the last year included in CBO’s scenarios). This estimate of potential future war-related funding requirements is also roughly consistent with trends in the share of overall US defense spending accounted for by military operations over the past half century.<sup>36</sup> Assuming that, on average, an additional \$30–70 billion would be spent on military operations each year, total spending on defense would average about \$550–590 billion a year over the next 20 years – and the share of GDP allocated to defense over this period would fall from today’s level of about 4.5–5.0 percent to some 2.3–2.4 percent in 2028.

<sup>35</sup> These estimates include the \$66 billion in DoD funding for military operations in 2009 approved by Congress at the end of June 2008.

<sup>36</sup> Since the end of World War II, funding for military operations has on average accounted for about 8 percent of total defense spending.

FIGURE 4. US DEFENSE SPENDING AS A SHARE OF GDP, 1946–2009



Source: CSBA based on DoD data.

## DEFENSE SPENDING AND THE ECONOMY

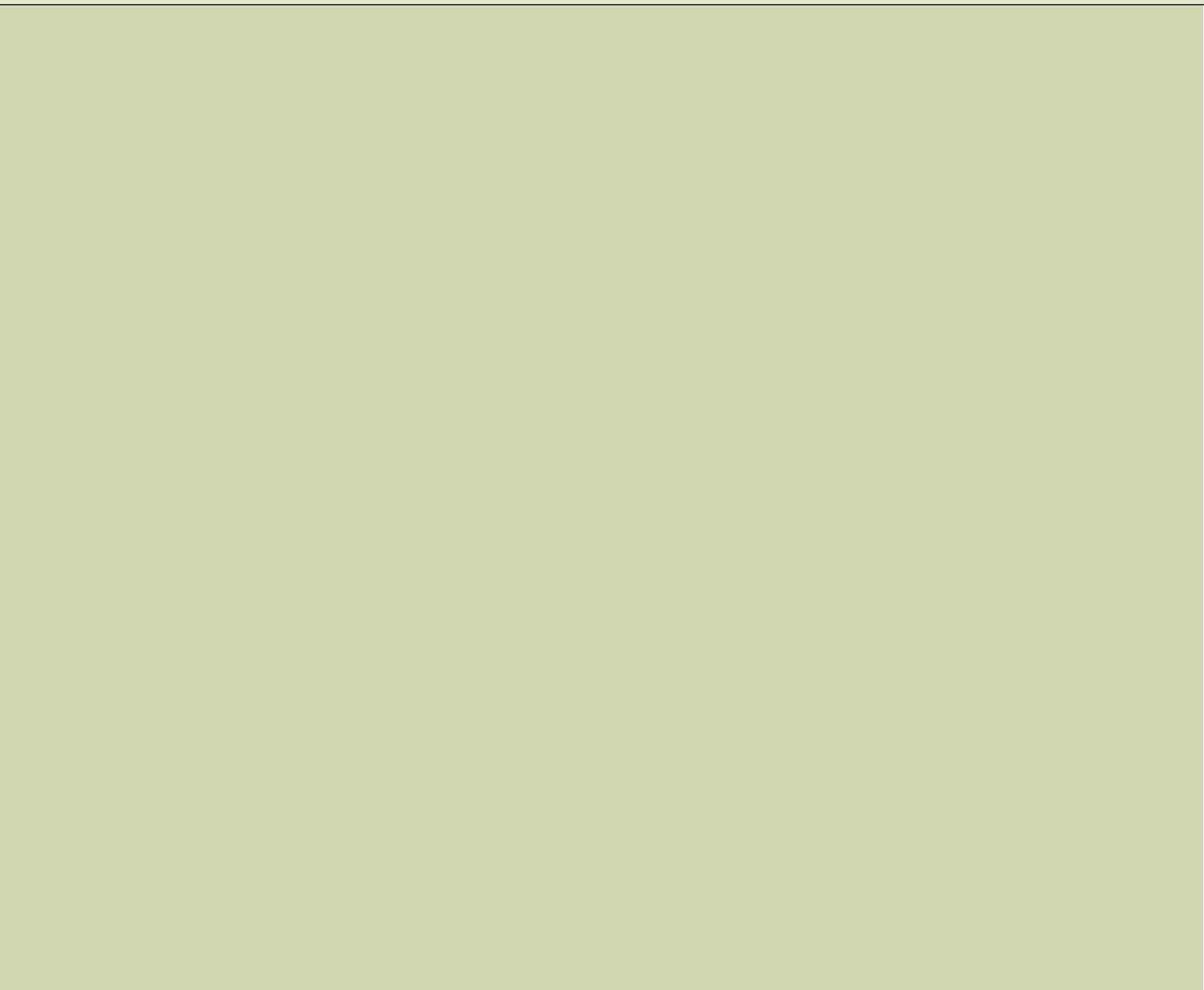
The share of GDP allocated to defense has declined significantly over the past half century (see Figure 4). This fact has led some observers to argue that, notwithstanding today's historically high level of funding for defense, the United States can afford to and should increase the defense budget to still higher levels. Recently, for example, a number of groups and individuals have proposed that the policymakers should commit to sustaining a base defense budget that, over the long-term, maintains roughly a 4 percent share of GDP.<sup>37</sup> Increasing the base defense budget to 4 percent of GDP would cause defense spending to grow substantially over the near-term, and would result in base defense budgets that, over the next two decades, would on average be one-third larger than a budget that remained flat at the 2009 level.

It is far from clear that such a high level of defense spending would be needed to provide adequately for US security. And this level of spending is far more than would be needed to pay for DoD's current long-term defense plan (discussed in the next chapter). But whatever one thinks about the wisdom or necessity of instituting an increase in defense spending of this magnitude, the analysis and discussion in this chapter suggests that—at least absent a major change in the strategic environment, or similarly significant economic or other changes—such a permanent upward shift in funding for defense is unlikely to occur over the next two decades. Although it is certainly possible that such a shift could occur, it would also run very much counter to the persistent tendency, exhibited over the past 50 years, for defense spending to grow less rapidly than the economy—resulting in a steady decline in share of GDP absorbed by defense (see Figure 4).

---

<sup>37</sup> See, for example, Baker Spring, "Four Percent for Freedom: Spend More on National Defense," *The Heritage Foundation*, Executive Memorandum #1027, May 29, 2007.





## CHAPTER 2 > THE CURRENT LONG-TERM PLAN AND ITS LIKELY COST

The 2008–13 Future Years Defense Program lays out DoD’s plans for the next six years in great detail. Among other things, the FYDP specifies the DoD’s personnel, force structure, readiness, and modernization plans for this period, as well as the (estimated) costs and funding requirements associated with implementing these plans. DoD’s plans for the years beyond the FYDP are generally more vague, and in some cases unsettled. Nevertheless, the general outlines of DoD’s long-term plan — and, in many instances, specific details of that plan — are relatively easy to identify. The purpose of this chapter is to very briefly describe DoD’s current long-term plan — focusing roughly on the next two decades — and to assess the likely cost of executing that plan.

At the most basic level, defense planning requires making decisions concerning three important characteristics of any military: its size, level of readiness and the effectiveness of its weapons and equipment. Funding requirements are also largely driven by these considerations.

DoD’s current long-term plan calls for:

- > Modestly increasing the size of the US military;
- > Maintaining relatively high readiness levels; and
- > Modernizing US forces across a broad range of areas.

Each of these attributes of the current defense plan are discussed briefly below. This discussion is followed by an analysis of the likely cost of executing that plan.

### THE CURRENT LONG-TERM DEFENSE PLAN

The goals, strategy, assumptions and programmatic details of the current long-term defense plan were outlined, most recently, in DoD’s 2006 QDR. By drawing upon that document, DoD’s most recent FYDP, and other DoD and Service planning documents

and justification materials, it is possible to discern the major long-term force structure, readiness and modernization plans of the US military. Although those plans contain some significant transformational elements, to a great degree they reflect a continuation of plans and policies, as well as specific programs, long embraced by DoD and the Services.

### Force Structure Plans

Under DoD's current plan, the size of the US military is projected to grow modestly over the next five years.

The US military currently consists of some 1.38 million active duty and 828,000 reserve personnel. Under DoD's current plan, the size of the US military is projected to grow modestly over the next five years. This growth will result from the administration's decision, announced in early 2007, to increase the permanent active duty end strength of the Army and Marine Corps by, respectively, 65,000 and 27,000 troops.<sup>38</sup> Compared to today's levels, however, the increase will be substantially smaller than these figures suggest, since the Army and Marine Corps are already operating (under temporary authority) above their permanent end strength targets.<sup>39</sup> At the same time, current plans also call for making modest reductions in the end strength of the Navy and the Air Force over the next few years. These cuts will offset much of the increase projected for the Army and Marine Corps. The net effect of these changes will be to leave the US military with an active duty end strength of about 1.39 million personnel by around 2013, only slightly above today's level. Although the Services do not specify end strength levels beyond 2013, their long-term plans appear to assume that the levels projected for 2013 will be sustained indefinitely.

In terms of force structure (e.g., numbers of Army brigades, Navy carrier strike forces and Air Force fighter wings), DoD plans envision some changes in both organization and numbers. The most significant changes may be in the Army. Until recently, the Army's active duty forces were organized around 10 divisions, each of which consisted of three combat brigades, plus three independent brigades or regiments—for a total of 33 combat brigades. Under the Army's "modularity" initiative, announced in 2004, a fourth brigade is to be created in each division—increasing the total number of combat brigades to 42.<sup>40</sup> These Brigade Combat Teams (BCTs) are also to be manned and equipped so that they can operate independently more

<sup>38</sup> Under the Army's new plan, the end strength of the Army National Guard and Reserve would also be increased by a total of about 9,200 troops.

<sup>39</sup> At the end of 2007, the Army and Marine Corps were operating above their permanent end strength targets by, respectively, about 40,000 and 11,000 personnel. This means that, compared to today's actual levels, the end strength increases proposed by the administration would expand the two Services by 25,000 and 16,000 troops, respectively.

<sup>40</sup> The extra troops needed for these BCTs were to be provided by shifting personnel from missions and functions for which the Army currently has excess capacity (e.g., field artillery and air defense) and by making other changes—rather than by increasing Army end strength. Under the plan, the Army National Guard was to be similarly reorganized into 28 modular brigades.

effectively.<sup>41</sup> The Army expects that the 2007 decision to expand its end strength will allow the number of BCTs to be increased to 48. For its part, the Marine Corps plans to use its added end strength to increase the number of Marine Expeditionary Forces (MEFs) in its active component from 2.5 to 3.

The Navy has released the most detailed long-term force structure plan. The Navy's goal is to maintain a fleet that, in terms of numbers and types of ships, is roughly comparable to, but somewhat larger than, today's. Perhaps the biggest difference is that it plans to introduce large numbers of a new, and relatively small and inexpensive, type of surface combatant, the Littoral Combat Ship (LCS). The Navy projects that, as a result of the introduction of the LCS, it will be able to increase the number of battle force ships in its fleet from about 279 today to some 313 over the next two decades.<sup>42</sup>

The Air Force's long-term force structure plans are somewhat less clear. However, in terms of most of the Service's major force elements — such as fighter, airlift and tanker capabilities — it appears to envision maintaining roughly the same number of aircraft over the next 20 years as it has today. One exception is the Air Force's bomber fleet, where current plans envision an expansion of that force beginning around 2018.<sup>43</sup>

**Military readiness encompasses a broad array of different force attributes and capabilities.**

## Readiness Plans

Military readiness encompasses a broad array of different force attributes and capabilities. Among the most important of these are troop quality, individual and unit training, and equipment maintenance and repair. No matter how large the military or how modern and capable the weapon systems, if military forces are not composed of high quality, well-trained troops and their equipment is not in good working order, those forces may well prove ineffective. Although less clearly and directly linked to combat capabilities, healthcare, base operations and support, and other “infrastructure” functions also are critical to sustaining high levels of readiness.

---

<sup>41</sup> The Army claims that this restructuring would increase by 46 percent the readily available combat power it can deploy to military operations, and thus substantially improve its ability to sustain large-scale military operations, such as those in Iraq. But others have raised doubts about whether, or by how much, the Army's modularity plan will actually improve its ability to sustain such operations. CBO has concluded, for example, that although the number of brigades will be substantially increased under the initiative, the Army's combat forces (measured in terms of maneuver units, such as armor and infantry companies) would be increased by only 5–19 percent, at most — and possibly not at all. Adam Talaber, *Options for Restructuring the Army* (Washington, DC: CBO, May 2005), p. 8.

<sup>42</sup> According to CBO projections, under current plans, the Navy would reach the 313-ship level around 2017. J. Michael Glimore, CBO Assistant Director for National Security, and Eric Labs, Senior Analyst, “The Navy's 2008 Shipbuilding Plan and Key Ship Programs,” Statement Before the House Armed Services' Subcommittee on Seapower and Expeditionary Forces, July 24, 2007.

<sup>43</sup> For estimates of the Service's inventory plans for major weapon types through 2024, see CBO, “The Long-Term Implications of Current Defense Plans: Detailed Update for Fiscal Year 2007,” April 2007.

Current DoD plans call for maintaining—and in many cases expanding—this technological edge through a robust and broad modernization program.

Historically, and especially since the transition to the all-volunteer force, the US military has attempted to maintain relatively high readiness levels. In the case of military personnel, for example, over the past two decades the Services have generally maintained relatively high standards for recruit quality. The goal has long been to have at least 90 percent of recruits be high school graduates and to have at least 60 percent of them score above average on the Armed Force’s Qualification Test (AFQT)—and by and large since the mid 1980s they have been able meet this goal. Likewise, the Services’ have, for the most part, succeeded in retaining the personnel they need. Over the past two decades, the Services have also generally been successful in maintaining robust training programs (measured, for example, in terms of aircraft flying hours, ship steaming days and tank miles) and high equipment mission-capable rates.

As a result of the stress caused by lengthy deployments in Iraq and Afghanistan and other factors, the Army has had difficulty meeting its goals for recruit quality over the past few years. Although the Army continues to meet its overall retention goals, it appears to be suffering shortages in certain categories of personnel, as well as some reduction in quality.<sup>44</sup> Similarly, the wars in Iraq and Afghanistan have caused substantial amounts of military equipment—especially Army and Marine Corps hardware—to fall into disrepair. While it is difficult to measure precisely the effect these military operations have had on the Army and Marine Corps, the impact on readiness has clearly been significant. The effect on the Air Force and Navy generally appears to have been much more modest. A major goal of the Army and Marine Corps in coming years will be to recover from these operations.

Beyond that, it appears that in most areas the Services’ long-term plans call for maintaining roughly the same high levels of readiness they have sustained over the past two decades—measured in terms of troop quality, training, equipment serviceability, and other readiness metrics. However, the Services—and the Army in particular—have also indicated that, at least in some areas, over the long run they hope to maintain higher levels of readiness than they did prior to the wars in Iraq and Afghanistan.

### Modernization Plans

The US military operates far more sophisticated and capable weapon systems than any other country in the world. Current DoD plans call for maintaining—and in many cases expanding—this technological edge through a robust and broad modernization program. Under those plans, a large number of new weapon systems are projected to move from development to production, or from low-rate production to full-rate

<sup>44</sup> Among other things, the upward trend in officer promotion rates witnessed over the past several years may indicate some reduction in quality—it suggests that some personnel who in the past would have been passed over (and eventually separated from service) are now, instead, being promoted.

production over the next 5-10 years. At the same time, other new systems will be moved through the research and development (R&D) process to be placed into production a decade or more from now. In part, this ramping up of DoD's weapons acquisition programs reflects the fact that, in some (though by no means all) areas, DoD took something of a "holiday" from weapons procurement during much of the 1990s and the early 2000s.<sup>45</sup>

The Bush administration has argued that the US military must be not only modernized, but transformed. This transformation, it states, is needed because the nature of the military challenges confronting the United States is changing, in some cases dramatically, as are the means and opportunities for effectively confronting those emerging challenges. Reflecting this belief, DoD's plans include a number of relatively new and different kinds of weapon systems — such as a variety of unmanned aerial vehicles (UAVs). For the most part, however, these plans are focused on more traditional types of weapon systems. Among the most important (and costly) modernization programs included in DoD's current long-term plans are following:

- > F-35 JOINT STRIKE FIGHTER (JSF). This program is intended to lead to the fielding of a family of fighter aircraft to be used by the Air Force, Navy and Marine Corps. Altogether, current plans call for procuring a total of some 2,443 F-35s, at total cost of about \$247 billion. These aircraft are to be procured between 2007 and 2034, with production quantities growing from 2 in 2007 to over 100 a year after 2013.<sup>46</sup>
- > FUTURE COMBAT SYSTEM (FCS). Through the FCS program, the Army plans to develop a family of 14 combat vehicles and other systems, including UAVs and sensors, with which to equip the Army beginning around 2014. The cost of the program, which would eventually result in the procurement of enough weapon systems to equip about one-third of the Army, is projected to reach some \$150 billion or more.<sup>47</sup>
- > DDG-1000 DESTROYER. Formerly known as the DD(X), this new ship is designed to be a multi-mission combatant with a substantial land-attack capability.<sup>48</sup> Current Navy plans call for buying a total of seven DDG-1000s. The Navy's goal is to reach a unit price of \$2.3 billion. However, CBO estimates that the average cost per ship will be about \$3.9 billion.<sup>49</sup>

---

<sup>45</sup> For example, during the 1990s Air Force fighter and Navy submarine production fell dramatically. On the other hand, through that decade the Air Force and the Navy, respectively, continued to procure relatively large numbers of airlift aircraft and guided-missile destroyers.

<sup>46</sup> For a discussion of the F-35 program, see Steven Kosiak and Barry D. Watts, *US Fighter Modernization Plans: Near-Term Choices* (Washington, DC: Center for Strategic & Budgetary Assessments, 2007).

<sup>47</sup> Frances M. Lussier, *The Army's Future Combat Systems Program and Alternatives* (Washington, DC: CBO, August 2006), p. 5.

<sup>48</sup> For a discussion of Navy plans for its surface fleet, see Robert O. Work, *Know When to Hold 'Em, Know When to Fold 'Em: A New Transformation Plan for the Navy's Surface Battle Line* (Washington, DC: Center for Strategic & Budgetary Assessments, 2007).

<sup>49</sup> Glimore and Labs, "The Navy's 2008 Shipbuilding Plan and Key Ship Programs," p. 13.

- › LITTORAL COMBAT SHIP (LCS). This is a new surface combatant intended to focus on the kinds of threats likely to be confronted in coastal waters, such as mines, diesel submarines and “swarming attacks” by small boats — with each ship capable of being equipped with different mission modules focused on different types of threats. Navy plans call for deploying a total of 55 of these ships over the next two decades.

These programs represent only the tip of the iceberg in terms of DoD’s long-term modernization plans. In addition to the four programs noted above, those plans include — over the next two decades — starting or continuing the production of, among other things, next-generation tanker aircraft, long-range strike systems (i.e., a manned or unmanned bomber), guided-missile cruisers, amphibious warfare ships, submarines, aircraft carriers, helicopters, tilt-rotor aircraft (i.e., the V-22), ballistic missile defense (BMD) systems, reconnaissance, intelligence and other satellites, and a range of precision-guided munitions.

**If anything, an analysis of historical cost and spending trends suggests that implementing DoD’s existing long-term plan might be even more costly than projected by CBO in its high-end estimate.**

## THE COST OF DOD’S LONG-TERM PLAN

The Congressional Budget Office has estimated that implementing DoD’s current long-term plan — including the force structure, readiness and modernization elements described above — would require increasing the department’s base budget from the requested 2009 level of about \$518 billion to an average of some \$535-575 billion annually through 2025.<sup>50</sup> The low-end (\$535 billion) estimate assumes that DoD would be able to hold down cost growth in both operations and support (O&S) activities and weapons acquisition programs far more successfully than it has been able to in the past. Conversely, the high-end (\$575 billion) estimate assumes that these costs would tend to increase, more in line with historical experience, beyond the levels projected by the Services. If anything, an analysis of historical cost and spending trends suggests that implementing DoD’s existing long-term plan might be even more costly than projected by CBO in its high-end estimate.

The idea that DoD’s base budget would have to be increased substantially to cover the full cost of the Services’ long-term plans is also consistent with the view, expressed by Army officials and others, that as US forces are withdrawn from Iraq and

<sup>50</sup> In addition to growth in base budget funding requirements, CBO’s high-end estimate assumes that DoD would, through 2025, continue to need additional funding to cover the cost of military operations. CBO, *The Long-Term Implications of Current Defense Plans: Summary Update for Fiscal Year 2008* (Washington, DC: CBO, December 2007). CBO does not include future costs for DoE and other defense-related activities (about \$23 billion in the 2009 request) in its projections.

Afghanistan some of the supplemental funding provided for those operations — rather than being eliminated — should be shifted to DoD’s base budget.<sup>51</sup>

## Operations and Support Activities

The O&S budget consists of programs and activities funded through DoD’s military personnel accounts, and its operations and maintenance (O&M) accounts.<sup>52</sup> The military personnel account funds the salaries of active duty and reserve members of the military. It also covers the cost of military retirement, housing and subsistence benefits, as well as retiree healthcare. The O&M budget covers the cost of salaries and benefits for most civilian DoD employees, as well as costs associated with purchasing a broad range of goods and services from the private sector. It funds programs and activities closely and directly related to the military’s near-term readiness, such as equipment operations, maintenance and repair, as well as various “infrastructure” functions, such as base operations and (most) military healthcare activities. Taken together, the military personnel and O&M accounts typically absorb about 60 percent of DoD’s base budget.

The 2009 request for DoD’s base budget contains about \$309 billion for O&S activities, including \$129 billion in military personnel and \$180 billion in O&M funding. Funding for both of these areas has been increased substantially over the past decade. Military compensation has enjoyed an especially large increase. This increase is due to a variety of changes instituted in the last two years of the Clinton Administration, or initiated, reinforced, or expanded under the Bush Administration. Overall compensation per active duty service member (exclusive of veterans’ benefits) grew by about \$24,000, or 33 percent, between 1999 and 2005.<sup>53</sup> More than half of this \$24,000 increase (58 percent) was allocated to improvements in non-cash benefits, especially deferred benefits. Improvements in retiree benefits (e.g., the introduction of the Tricare For Life program<sup>54</sup> and increases in pension payments) accounted for about three-quarters of the increase in non-cash benefits (and 43 percent of the overall increase in compensation) provided over this period.

**The O&S budget consists of programs and activities funded through DoD’s military personnel accounts, and its operations and maintenance (O&M) accounts.**

---

<sup>51</sup> Over the past several years, DoD has expanded substantially the types of programs and activities funded through emergency supplemental appropriations. Incremental costs directly related to the wars in Iraq and Afghanistan (e.g., the cost of activating reserve personnel, operating forces more intensively, and repairing and replacing equipment damaged or destroyed in those conflicts) still account for the lion’s share funding provided through these measures. However, the 2008 supplemental request, for example, appears to include as much as several tens of billions of dollars for programs unrelated (or, at best, only indirectly related) to those wars — i.e., programs that would normally be funded through DoD’s base budget.

<sup>52</sup> Although not included in CBO’s definition, military construction and family housing (about \$24 billion in the 2009 request) are sometimes considered O&S activities.

<sup>53</sup> Steven M. Kosiak, *Military Compensation: Requirements, Trends and Options* (Washington, DC: Center for Strategic & Budgetary Assessments, February 2005), p. 27.

<sup>54</sup> This program covers any healthcare costs incurred by military retirees over 65 that are not covered by Medicare.

Cash compensation for active duty service members increased by some 25 percent between 1999 and 2005.<sup>55</sup> Raises in basic pay and the basic allowance for housing accounted for almost all of this growth. Across-the-board increases accounted for about 90 percent of the growth in cash and non-cash benefits that occurred between 1999 and 2005, while targeted increases directed at particular classes of personnel (e.g., those with special skills or in particular occupations) accounted for some 10 percent of the growth in compensation.<sup>56</sup>

O&M funding in DoD's base budget has also been increased substantially over the past decade—growing by some 35 percent. Moreover, O&M funding in DoD's base budget is higher today than it has been at any time in the past.

In its low-end estimate, CBO projects that military pay would be increased as proposed in the latest FYDP through 2013, and thereafter grow at the same rate as the employment cost index (ECI), a measure of wage growth in the overall economy. This would result in average annual military pay raises of about 1.5 percent through 2025, and cause military personnel funding to reach about \$161 billion in 2025.<sup>57</sup> In its high-end estimate, CBO assumes that (consistent with recent history) pay raises would be half a percentage point higher than proposed in the current plan through 2013, causing the military personnel budget to reach \$163 billion in 2025.

CBO's low- and high-end estimates differ much more substantially in their assumptions about projected O&M funding requirements. According to CBO's low-end estimate, implementing the current plan would require increasing O&M funding at an average annual rate of about 1.3 percent over the next two decades. As a result, under DoD's long-term plan, the department's annual O&M budget would be projected to grow to some \$213 billion in 2025.<sup>58</sup> Increases in pay for DOD civilian employees and rising healthcare expenditures would account for the vast majority of this cost growth.<sup>59</sup> By comparison in its high-end estimate, CBO projects that O&M funding in DoD's base budget will grow to about \$231 billion in 2025.

The main reason for this difference is that the high-end estimate assumes that military healthcare costs will grow more rapidly. Under CBO's low-end estimate, military healthcare activities funded through the O&M budget are projected to grow from

---

<sup>55</sup> The jump in pay was, in part, a result of language included in the FY 2000 defense authorization act which required that pay raises provided over the FY 2000–06 period be at least one-half a percentage point above the ECI.

<sup>56</sup> Kosiak, *Military Compensation: Requirements, Trends and Options*, p. 27.

<sup>57</sup> CBO, *Long-Term Implications of Current Defense Plans: Summary Update for Fiscal Year 2008*, p. 3.

<sup>58</sup> *Ibid.*

<sup>59</sup> Other factors projected by CBO to contribute to O&M cost growth in coming years include the aging of the Services' weapons inventories and the introduction of next-generation weapon systems (which frequently have higher O&M costs than their predecessors).

about \$21 billion in 2008 to some \$37 billion in 2025.<sup>60</sup> By contrast, in its high-end estimate CBO projects that those costs would reach \$48 billion a year by 2025.<sup>61</sup>

CBO's low-end estimate projects that total O&S funding requirements (military personnel plus O&M) in DoD's base budget would increase from about \$309 billion in 2009 to \$374 billion in 2025, while under its high-end estimate O&S costs would ultimately reach \$394 billion. This equates to *average* O&S funding requirements in DoD's base budget over the 2009–2025 period of some \$342–352 billion, or \$33–43 billion a year more than requested for 2009. And if history is any guide, CBO's high-end projection is probably the better estimate.

### Acquisition Programs

The acquisition budget consists of DoD's R&D and procurement accounts. The R&D account funds the development and testing of new weapon systems and other equipment, while the procurement account funds the production of weapon systems and other equipment.

DoD's acquisition budget has grown substantially over the past decade. The \$184 billion in acquisition funding included in DoD's 2009 base budget request is about \$70 billion, or 62 percent, more than was provided for weapons acquisition a decade ago. Today's acquisition budget is also high by historical standards. It is only slightly below the \$185 billion average annual level sustained during the 1980s, the historical peak for acquisition funding in DoD's base budget.

CBO's low-end cost estimate assumes that DoD will be able to meet effectively its current development and procurement cost goals for new weapon systems. Based on this assumption, CBO projects that fully implementing DoD's long-term modernization plans would require sustaining average acquisition budgets of about \$179 billion a year through 2025. Thus, if existing cost goals for new weapon systems can be met, CBO concludes that the Services' long-term modernization plans could be implemented within acquisition budgets somewhat lower than today's.

By contrast, CBO's high-end cost estimate assumes that, consistent with historical experience, new weapon systems will end up costing more to develop and procure than projected in DoD's plans. Overall, CBO's high-end estimate projects that because of this cost growth, fully implementing DoD's current modernization plans would require increasing acquisition funding in DoD's base budget to an average of some \$200 billion a year over the 2008–25 period. This is about 12 percent more than projected in CBO's low-end estimate.

DoD's acquisition budget has grown substantially over the past decade.

<sup>60</sup> CBO, "The Long-Term Implications of Current Defense Plans," p. 8. The O&M budget covers more than half of the Services' healthcare costs. The remainder is funded primarily through military personnel appropriations.

<sup>61</sup> Ibid.

History suggests that even CBO's high-end estimate may understate the acquisition costs associated with the current long-term defense plan.

Historically, two types of cost growth have affected funding requirements for DoD's weapons modernization plans. The first type of cost growth reflects the fact that each generation of new weapon system acquired by the Services typically costs substantially more to develop and procure than the system it is intended to replace. Over the past 50 years unit procurement costs for new generations of combat aircraft and surface combatants, for example, have tended to grow at an average annual rate of some 5.5 percent and 6.7 percent, respectively.<sup>62</sup> In other words, historically, the unit procurement costs of new combat aircraft and surface combatants have tended to double roughly every 10–15 years. A very similar trend in unit procurement costs can be seen in the case of other types of ships and submarines, combat vehicles and other equipment.

Weapon R&D costs have also grown significantly over time. For example, the Air Force's F-15 fighter, first deployed in the mid 1970s, cost about \$9 billion to develop. By comparison, the F-22, which is intended to replace the F-15 and was first deployed in 2005, has required about \$33 billion in R&D funding. Likewise, the F-35 fighter is projected to have total R&D costs of about \$46 billion, making it nearly three times more costly to develop than the aircraft it is intended to replace.<sup>63</sup>

The second type of cost growth affecting weapons acquisition programs reflects the fact that DoD generally underestimates what it will cost to develop and procure a new weapon system. Typically, new generations of weapon systems turn out to cost some 30-60 percent more to develop than DoD projects at the time a decision is made to move the system into full-scale development.<sup>64</sup> Likewise, the unit procurement costs of new weapon systems typically end up being about 40 percent more than initially projected by DoD — even adjusting for changes in quantity.<sup>65</sup>

CBO's low-end estimate takes into account this first type of cost growth to some extent, but not the second type. By contrast, CBO's high-end estimate attempts to incorporate both types of acquisition cost growth.

History suggests that even CBO's high-end estimate may understate the acquisition costs associated with the current long-term defense plan. In particular, that estimate may well understate future R&D funding levels. As noted above, according

<sup>62</sup> The nominal (vice real) growth rates for combat aircraft and surface combatants averaged about 9.3 percent and 10.7 percent, respectively, over this period. Mark V. Arena, Irv Blickstein, Obaid Younossi, Clifford A. Grammich, *Why Has the Cost of Navy Ships Risen?* (Santa Monica, CA: RAND, 2006), pp. 15–16.

<sup>63</sup> The F-35 (which includes three variants) is intended to replace the Air Force's F-16, the Navy's F-18C/D and the Marine Corps' AV-8B aircraft.

<sup>64</sup> Mark V. Arena, Robert S. Leonard, Sheila E. Murray and Obaid Younossi, *Historical Cost Growth of Completed Weapon System Programs* (Santa Monica, CA: RAND, 2006), p. 21.

<sup>65</sup> Ibid. Some, but by no means all, of this cost growth is attributable to inflation. One study that attempted to normalize historical cost data to remove the impact of inflation concluded that major weapons acquisition programs typically experience real cost growth of about 30 percent (adjusted both for inflation and quantity). J.A. Drezner, J.M. Jarvaise, R.W. Hess, P.G. Hough and D. Norton, *An Analysis of Weapon System Cost Growth* (Santa Monica, CA: RAND, 1993), p. 22.

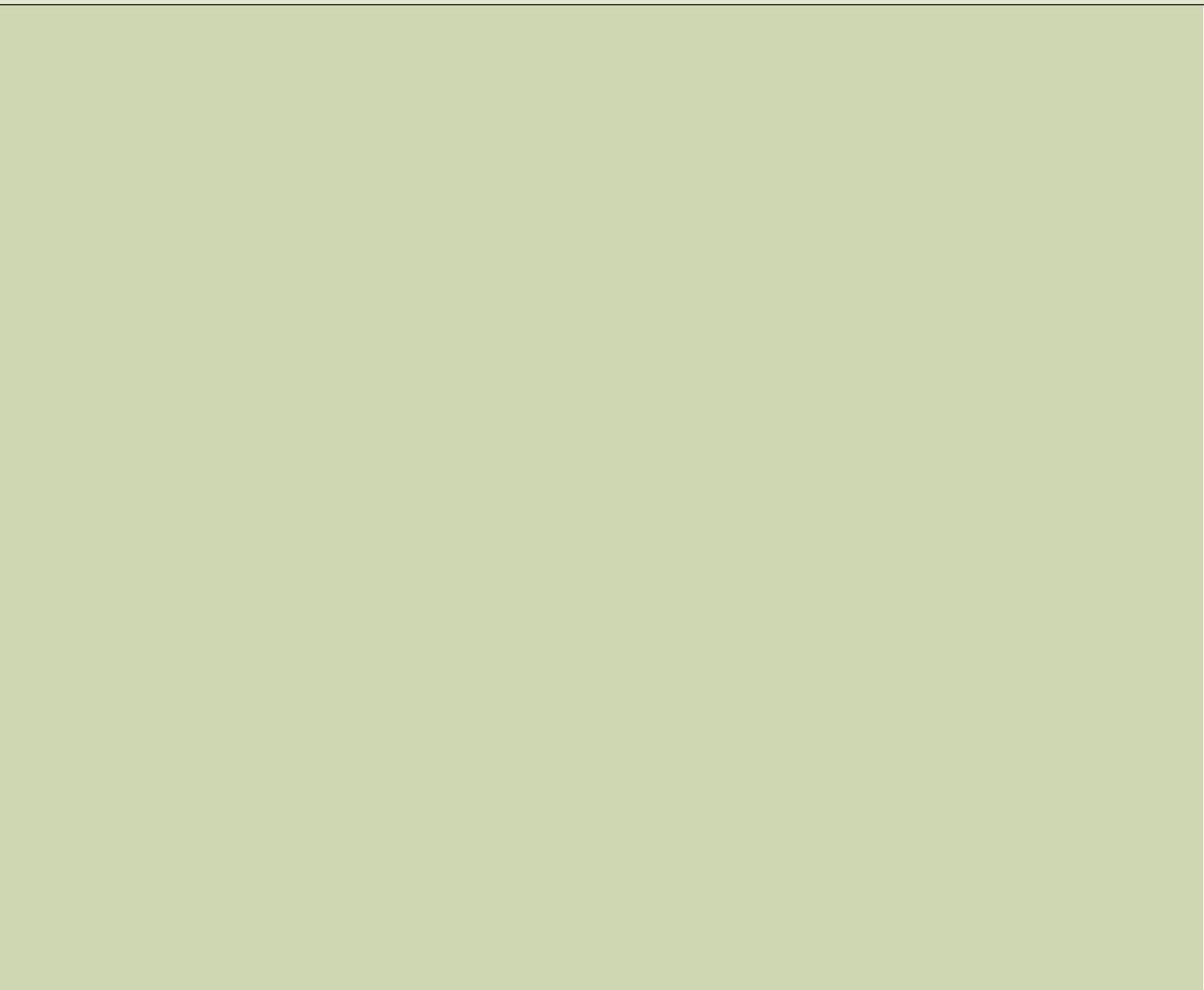
to CBO's low-end estimate the level of acquisition funding included in today's DoD base budget, if it could be sustained through 2025, would be sufficient to pay for the Services' existing weapons acquisition plans. However, while the total level of acquisition funding provided would be adequate, the relative balance between R&D and procurement funding would change. Specifically, CBO's low-end estimate projects that, under the current plan, R&D funding in DoD's base budget would decline from \$79 billion in 2009 to \$51 billion in 2025, and would average some \$62 billion annually through 2025. This funding would essentially be transferred to DoD's procurement budget, which is projected in CBO's low-end estimate to grow from \$104 billion in the 2009 request to an average of some \$117 billion a year over this period.

As noted earlier, CBO's high-end estimate assumes that DoD would require higher levels of acquisition funding to implement its long-term modernization plans. Assuming that R&D and procurement costs would be similarly affected, this high-end estimate implies future funding requirements of roughly \$70 billion for R&D and \$130 billion for procurement. This means that, even under CBO's high-end estimate, R&D funding would be projected to decline significantly in coming years, albeit somewhat less dramatically than indicated in CBO's low-end estimate. However, an analysis of R&D funding trends indicates that such a decline may be unlikely.

Although R&D funding has suffered some periods of decline, since the end of World War II, the overall trend has been generally and substantially upward. Given this trend, it may be more realistic to assume that R&D funding will on average be higher, rather than lower, over the next two decades than it is today. Equally important is that, at least since the end of World War II, defense R&D and procurement funding have always tended to move in the same direction. There has never been a sustained period during which procurement funding was increased substantially, while R&D funding was cut significantly. This suggests that if procurement funding is to reach the higher levels needed, according to CBO, to pay for DoD's existing long-term modernization plans, it may be prudent to assume that R&D funding levels will likewise be increased—or at least not cut—over the 2009–25 period.

If it is assumed that, in order to implement its current modernization plan, DoD's procurement budget would have to be increased to the levels projected by CBO in its high-end estimate, and that R&D funding would be kept at today's level (rather than reduced, as projected even in CBO's high-end estimate), DoD's acquisition budget would be projected to average about \$210 billion a year over the 2009–25 period. This is some \$25 billion above the level requested in DoD's 2009 base budget.

Although R&D funding has suffered some periods of decline, since the end of World War II, the overall trend has been generally and substantially upward.



## CHAPTER 3 > RECONCILING THE PLANS-FUNDING MISMATCH

The first two chapters of this report suggest that the United States may face a significant mismatch between the level of funding likely to be available for defense over the next two decades, and the cost of implementing DoD's current force structure, readiness, and modernization plans over that same period. Chapter I indicates that based on the latest FYDP, historical trends and budget pressures associated with the projected retirement of the baby boomer generation, the most prudent assumption is that funding for defense (exclusive of war costs) will stay relatively flat over the next two decades. Conversely, Chapter II indicates that, assuming historical rates of cost growth in acquisition programs and O&S activities, fully implementing DoD's current long-term plan would require increasing funding for defense well above today's level, and sustaining it at that higher level for the next 20 years.

Although the precise magnitude of this mismatch is impossible to ascertain, a reasonable estimate is that funding levels are likely to remain at roughly \$518 billion a year over the next two decades, while implementing the current long-term plan would require average annual DoD budgets of around \$575 billion. This latter figure is based on CBO's high-end estimate of future costs. As discussed in the preceding chapter, this estimate — which is based on historical rates of cost growth in O&S activities and acquisition programs, and implies an average gap of roughly \$55 billion a year — may, if anything, understate the level of funding required, and thus the size of the mismatch.

The goal of this chapter is to inform the question of how DoD planners and policymakers might respond to the pressures caused by this prospective plans-funding mismatch. It does so by discussing six different options that, in theory, might be exercised in order to make DoD's long-term plans more affordable. These options include:

- > Reducing the size of the US military;
- > Introducing new generations of weapon systems less frequently;

- > Accepting an older weapons inventory;
- > Acquiring less costly weapon systems;
- > Transforming the military; and
- > Improving the efficiency of the military.

Of necessity, the discussion of each of these options is relatively brief and generic in nature. As such, in all cases, it should be viewed, not as an endpoint, but as very much a starting point for further — much more in-depth and detailed — analysis.

These options are not exhaustive. But they include some of the most interesting and/or likely options that DoD could pursue. Some readers will view one or more of these responses as prudent and appropriate, while others will find all of them problematic. Those in this first category may conclude that much, or perhaps all, of DoD's projected plans-funding mismatch could be eliminated by modifying existing plans. Conversely, those in the latter category are likely to conclude that the only satisfactory way of eliminating this gap would be to increase substantially the level of funding provided for defense — although, as suggested in Chapter I, it might be difficult to institute and sustain such an increase.

## REDUCE THE SIZE OF THE US MILITARY

The willingness of US military planners to trade off quantity for quality — specifically, to accept reductions in force size as the price of acquiring successive generations of new weapon systems that are typically far more capable, and costly, than the systems they are designed to replace — has been one of the most important constants in US defense policymaking and planning over the past 50 years. The decision to accept this tradeoff largely explains how the US military has been able to buy new weapon systems that typically have far higher R&D and unit procurement costs than their predecessors, and to man its forces with progressively higher quality and more costly personnel — all within a defense topline that has, on an average annual basis, grown relatively slowly.

The number of personnel in the US military has declined significantly over the past 50 years. It is widely known that the US military's personnel end strength was cut substantially after the end of the Cold War. Between 1990 and 2001, the US military's active duty end strength was reduced from about 2.07 million to about 1.38 million troops, a cut of about 35 percent (with the bulk of those cuts being completed by the mid 1990s). What is much less widely appreciated is that even *during* the Cold War, the size of the US military was reduced. Between 1955 and 1990, for example, active duty end strength fell from about 2.94 million to 2.07 million. Although the decline in the size of the US military has not followed an entirely smooth curve, the overall

The number of personnel in the US military has declined significantly over the past 50 years.

trend is unmistakable. Altogether, over the past 50 years, the size of the US military has been cut roughly in half.

Absent this reduction in the size of the military, the relatively rapid growth in R&D and unit procurement costs, as well as O&S cost per troop, experienced over the past 50 years (and described in the preceding chapter) could not have been reconciled with the significant, but much slower rate of growth that has occurred in the defense topline over these same years. The view taken consistently by DoD planners over the past five decades has been that new generations of weapon systems are so much more effective than their predecessors that they should be purchased even when it means that — because of the much higher cost of these new weapons — the existing inventory of current-generation weapon systems must be replaced on less than a one-for-one basis. Paralleling this decision, they have also chosen to emphasize quality over quantity in the case of military personnel and force structure.

In general, the willingness of the US military to make this quality-quantity tradeoff appears to have served it well. Weapon-for-weapon and unit-for-unit, US military forces have become progressively more capable, and in many instances far more capable, over the past 50 years. And despite reductions over these same years in the number of weapon systems and units deployed, it appears that the overall capabilities of the US military have, likewise, generally improved — often dramatically.

The impact of improved technology on the US military's capabilities, and the logic of trading off quantity for quality, can be seen perhaps most clearly in the case of US air forces. US air forces have become far more capable over the past several decades as a result of a variety of technological improvements. These include the acquisition of a “silver bullet” force of stealthy (i.e., radar evading) fighters and bombers, improvements in aircraft maneuverability, the incorporation of more effective sensors and other avionics aboard combat aircraft, the acquisition of improved precision-guided munitions (PGMs), and the proliferation of aircraft capable of employing PGMs. As a result of these and other changes, US air power has become far more potent over the past several decades, even as the size of the US military's air forces has declined.

Some idea of the extent to which US air power has grown in effectiveness over the past decade-and-a-half despite reductions in the number of aircraft deployed can be seen by comparing the capabilities and performance of US air forces at the time of the 1991 Gulf War with the capabilities and performance of those forces in the more recent wars in Afghanistan and Iraq. At the time of Operation Desert Storm, the US military possessed some 5,000 combat aircraft. In the 1990s, this force was reduced by roughly one-third. However, over this same period, the number of US combat aircraft capable of using PGMs was increased dramatically.

Laser-guided bombs (LGBs) were the most widely used, and perhaps most effective, type of PGM employed by US air forces during Operation Desert Storm. But the US military had only some 200-300 aircraft equipped with laser designators at the time. By comparison, by 2000, the number of Air Force, Navy and Marine Corps

In general, the willingness of the US military to make this quality-quantity tradeoff appears to have served it well.

aircraft equipped with laser designators had climbed to around 600. Today, thanks to the growing number of aircraft with laser designators, and the advent of the satellite-guided Joint Direct Attack Munition (JDAM), virtually all US ground-attack aircraft are capable of employing PGMs autonomously.

The operational effectiveness of this explosion in the number of PGM-capable aircraft has been profound. For many critical missions, the use of PGMs can increase the effectiveness of aircraft by an order of magnitude or more. Unguided “dumb” bombs often land hundreds of feet from their intended aim points. By contrast, LGBs and JDAMs have consistently achieved circular error probables (CEPs) of 10–20 feet.<sup>66</sup> Figure 5 shows how PGMs have grown as a share of the munitions employed by US air forces in conflicts waged over the past two decades. Partly as a result of this revolution in precision-strike capabilities, the Air Force needed to deploy only about 40 percent as many fighter aircraft in support of Operation Iraqi Freedom in 2003 as it did for Operation Desert Storm in 1991.<sup>67</sup>

The extent to which the acquisition of new weapon systems has allowed the US military to improve its overall capabilities, even as it has been required to make offsetting cuts in the size of its forces to cover the high cost of these weapons, can also be seen relatively easily in the case of US naval forces. Among the most important technological advances incorporated into new surface combatants purchased over the past two decades has been the replacement of above-deck rail missile launchers and

<sup>66</sup> Steven M. Kosiak, *Matching Resources With Requirements: Options for Modernizing the US Air Force* (Washington, DC: Center for Strategic & Budgetary Assessments, 2004), p. 52.

<sup>67</sup> *Ibid.*, p. 87.

**FIGURE 5: PRECISION-GUIDED MUNITIONS USED BY US FORCES IN RECENT CONFLICTS\***

<b>Conflict</b>	<b>Unguided Bombs</b>	<b>PGMs</b>	<b>Percentage PGMs</b>
Iraq (1991)	210,000	17,161	8
Kosovo (1999)	16,587	6,728	29
Afghanistan (2001–02)	11,201	12,001	52
Iraq (2003)	10,383	18,365	64

\* Sources include: GAO, *Operation Desert Storm: Evaluation of the Air Campaign* (Washington, DC GAO) June 1997, p. 178; William Arkin “Weapons Total from Afghanistan Includes Large Amount of Cannon Fire,” *Defense Daily*, Vol. 213, No. 42, March 5, 2002; and Lt. Gen. T. Michael Mosley, *Operation Iraqi Freedom-By the Numbers* (CENTAF-PSAB, Saudi Arabia: US Central Air Forces, April 30, 2003).

rotary missile magazines with the vertical launch system (VLS). The VLS magazine/launcher system allows for much more efficient storage and firing of air defense missiles and cruise missiles.

As a result of the introduction of the VLS system, notwithstanding the fact that the number of cruisers and destroyers in the US Navy was cut from 104 in 1989, at the end of the Cold War, to 80 by 2001, over that same period the number of missiles carried aboard these combatants increased from 7,133 to 7,917.<sup>68</sup> Perhaps more importantly, these missiles can be fired much more rapidly from VLS cells than they could be from the older rail missile launchers—greatly increasing the fleet’s ability, among other things, to defend against saturation attacks.

Unit-for-unit, US ground forces have also become progressively more capable. The Army and Marine Corps deployed the equivalent of about 11 divisions in the 1991 Gulf War.<sup>69</sup> By comparison, during the 2003 invasion of Iraq the US military deployed the equivalent of about 4 divisions, including only a single heavy Army division<sup>70</sup>—and, of course, the objectives of this second war were, in military terms, substantially more ambitious.

It is more difficult to demonstrate—with simple metrics—how increases in the quality of US military personnel and higher spending on O&S activities have, over time, led to a net improvement in capabilities sufficient to offset the reductions in force size that have been made to cover these higher costs. However, there is substantial evidence suggesting that, unsurprisingly, higher quality personnel (as measured by Armed Forces Qualification Test scores) tend to perform many important military tasks substantially better than lower quality (i.e., lower scoring) personnel. For example, one study found that performance in air combat simulations rises sharply with AFQT scores, while another showed a link between tank crew performance on firing ranges and test scores.<sup>71</sup> Presumably the fact that both US military personnel and civilian DoD workers have become, on average, more experienced and better educated has also resulted in significant performance improvements over the past several decades.

Given the consistency and persistence of the US military’s preference for far more costly and capable weapon systems and personnel over force size, and the apparent benefits—in terms of military capability—of making this tradeoff, it may make sense to continue along this path over the next two decades. Again, the potential logic of this approach can perhaps best be seen in the case of US air power.

Unit-for-unit, US ground forces have also become progressively more capable.

<sup>68</sup> Robert Work, *The Challenge of Maritime Transformation: Is Bigger Better?* (Washington, DC: Center for Strategic & Budgetary Assessments, 2002), pp. 57–58.

<sup>69</sup> John M. Collins, *Desert Shield and Desert Storm: Implications for Future US Force Requirements* (Washington DC: CRS, April 19, 1991), p. 4.

<sup>70</sup> CBO, “An Analysis of the US Military’s Ability to Sustain an Occupation of Iraq,” September 3, 2003, p. 4.

<sup>71</sup> Heidi Golding and Adebayo Adedeji, *The All-Volunteer Military: Issues and Performance* (Washington, DC: CBO, July 2007), p. 13.

As a result of these performance improvements, is it really necessary to replace the existing inventory of current-generation aircraft on essentially a one-for-one basis, as envisioned in current plans?

Under current plans, over the next three decades the Air Force, Navy and Marine Corps will replace their existing inventory of current-generation fighters—F-15s, F-16s and F/A-18s—with two new, next-generation fighters, the F-22 and the F-35. These new aircraft are far more capable than the systems they will be replacing. Among other things, these next-generation fighters will (unlike the fighters they are intended to replace) be stealthy, have improved avionics and, in the case of the F-22, the ability to cruise at supersonic speeds. As a result of these performance improvements, is it really necessary to replace the existing inventory of current-generation aircraft on essentially a one-for-one basis, as envisioned in current plans? Or might it be possible to further reduce the size of the Services' fighter forces, perhaps substantially, as these new aircraft begin entering service?

On the other hand, a simple continuation of the present trend toward smaller, but better equipped, trained and manned forces may not, in all cases, be appropriate. For most of the past 50 years, the focus of the US military has been on missions related to defeating conventional military forces or conducting strategic strikes (with conventional or nuclear weapons) against an adversary's homeland. For these kinds of missions, which typically involve attacks against armored units, and other conventional military forces, as well as strikes against military bases, ports, airfields, bridges and other infrastructure targets, history suggests quality can often be a highly effective substitute for quantity—a conclusion strongly supported, most recently, by the impressive performance of the US military against Iraq's conventional military forces during the initial invasion of that country in the spring of 2003. However, for other types of missions, it may prove more difficult to effectively substitute quality for quantity.

Nowhere may this be more true than in the case of "irregular" warfare—a term that subsumes stability operations, counter-insurgency, peacekeeping, and similar operations. These tend to be very labor-intensive missions, where the number of "boots on the ground" can matter critically and where the opportunity to use superior technology and training to offset the need for numbers appears to be more limited than in the case of operations against conventional military forces and strategic targets. Such operations also may require a much longer term presence than conventional military campaigns, necessitating the maintenance of a substantial rotation base.

Presently, the US Army and Marine Corps are focused heavily on stability operations in Iraq and Afghanistan. Moreover, the 2006 Quadrennial Defense Review calls for the US military, in the future, to devote greater resources and effort to such missions, and to shift away from what has been its traditional focus—the conduct of military operations against enemy conventional forces. Most recently, this shift in focus has been used by DoD to justify plans to expand the permanent active duty end strength of the Army and Marine Corps by, respectively, 65,000 and 27,000 troops.

There is reason to question whether the US Army has actually embraced this shift in focus. The centerpiece of the Army's modernization plans remains the FCS, a very costly system which appears to be "optimized to deploy quickly and defeat the kinds

of enemy forces the Army is least likely to encounter on the battlefield—combined arms, mechanized ground forces operating in the open.”<sup>72</sup> Moreover, the Army intends to use its share of the planned end strength increase to expand its number of active brigade combat teams, which are orientated primarily towards conventional operations.<sup>73</sup> Finally, the Army apparently has no plans to create training and advising organizations through which it could assist allies and other partners to “scale-up” their own irregular warfare capabilities—reducing the burden placed on US combat forces.<sup>74</sup> Thus, notwithstanding recent rhetoric, the depth of the Army’s commitment to the irregular warfare mission is suspect.

That said, it is certainly true that to the extent the irregular warfare mission is embraced by the Army and Marine Corps, those Services would be expected to place a relatively higher priority on numbers than they have in the past. Even in this case, the Army and Marine Corps would not be expected, henceforth, to forego entirely the trend toward substituting improved technology and higher quality personnel for numbers of troops. It is likely that, even for relatively labor-intensive missions like irregular warfare, new technologies will be introduced that will, over time, allow for some further substitution of technology and training for manpower.

However, to the extent such relatively labor-intensive missions remain a priority for the US military, in the case of the Army and Marine Corps the trend toward generally smaller, but much more capable forces would be expected to slow, perhaps significantly. The question of whether, or to what extent, these kinds of missions will (or should) dominate the planning of the US Army and Marine Corps over the next 20 years is, of course, an open question.

Increasingly, numbers may also matter for the US Navy. Unlike during the Cold War, the major threat confronting the US Navy today is not the possible emergence of another superpower navy operating on the high seas, but a range of lesser, but widely distributed threats focused in coastal waters—such as terrorists armed with small missile-armed boats, or mines. The primary danger of these threats is not that individually they will be capable of defeating US naval forces, but that they will manifest themselves in so many different chokepoints and other coastal areas around the world, or will be sustained for such a long period of time, that the US navy will lack the numbers of ships needed to effectively counter them and, if necessary, do so on a sustained basis. No matter how capable the warship, ultimately, it can be in only one place at any given time.

If this new view of the challenges facing the US Navy is correct and it becomes the focus of the Navy’s planning and programming efforts for the next two decades, it could significantly constrain the Service’s ability to—as it has in the past—use cuts in

It is likely that, even for relatively labor-intensive missions like irregular warfare, new technologies will be introduced that will, over time, allow for some further substitution of technology and training for manpower.

<sup>72</sup> Andrew F. Krepinevich, “The Future of US Ground Forces: Challenges and Requirements,” Testimony before the United States Senate Committee on Armed Services, April 17, 2007, p. 11.

<sup>73</sup> *Ibid.*, p. 10.

<sup>74</sup> *Ibid.*

the size its fleet as a means of offsetting growth in weapons acquisition and personnel costs. On the other hand, to the extent that the US Navy instead focuses its energies on potential future threats more akin to the type of challenge presented by the Soviet Navy during the Cold War—perhaps in the form of a rising China—its traditional approach to trading off numbers for quality may continue to be appropriate.

## **ACCEPT THE SLOWER INTRODUCTION OF NEW WEAPON SYSTEMS**

Another means DoD has used to reconcile the acquisition of progressively much more capable and costly next-generation weapon systems, and higher quality and more costly personnel, with a defense topline that typically grows—on an average annual basis—only relatively modestly, is to reduce substantially the frequency with which it introduces new weapon systems. This trend can perhaps best be seen in the case of combat aircraft programs. Between 1946 and 1965, the Air Force introduced (i.e., began deploying) 15 different types of new fighter and attack aircraft. Between 1966 and 1985, they introduced 5 new aircraft of these types. And between 1986 and 2005, the Services introduced only one new design (the F-22).

Put differently, over time DoD has been willing to accept a substantial reduction in the frequency with which new weapon systems are introduced into service as one of the prices it must pay to sustain its traditional preference for acquiring increasingly more capable and costly weapon systems and employing progressively higher quality and more costly personnel.

Whether the less frequent introduction of new weapon designs is deemed problematic is likely to rest in part on whether one believes that next-generation weapons platforms (e.g., ships, ground vehicles and aircraft) offer significant enough advances in capabilities to justify their very high costs. During various periods in history, dramatic advances have been made in the design and propulsion of weapons platforms. At other times, improvements have been more gradual and limited. Some observers argue that we are now in a period of rapid technological change in which it is critical to introduce a range of new weapons platforms. For example, some advocates of the F-22 and F-35 programs assert that the stealth revolution is rapidly rendering non-stealthy, current-generation aircraft vulnerable to enemy air defenses, and that this growing vulnerability can only be averted by relatively rapidly transitioning to an Air Force comprised primarily of stealth combat aircraft.

On the other hand, some observers argue that, at present, technological advances are occurring more gradually or are focused in areas—such as information technology—that do not necessarily imply the need to rapidly acquire next-generation weapons platforms. If, for example, the most critical technological advances are likely

to involve C4ISR systems,<sup>75</sup> such as satellites and various support aircraft, that can be used to locate, track and identify enemy targets, as well as electronics (e.g., sensors and communications equipment) and precision-guided munitions that can be incorporated into existing, current-generation weapons platforms, continuing to rely primarily on such platforms may not only be deemed acceptable, but appropriate.

## ACCEPT AN OLDER WEAPONS INVENTORY

Another effect of this combination of trends — on the one hand relatively modestly increasing defense budgets and, on the other, rapidly increasing weapons R&D and unit procurement costs, as well as growing O&S costs — has been for DoD to keep weapon systems in service for longer periods of time. This tradeoff too has traditionally been a prominent feature of the US military's approach to modernization. For at least the past several decades, the US military has accepted increased equipment age as one of the prices it is often willing to pay to in order to continue acquiring much more costly next-generation weapon systems.

The trend toward increased equipment age is easiest to trace, and most pronounced, in the case of US air power. The average age of the Air Force's fighter inventory grew from about 2 years in 1955, to 7 years in 1975, to 11 years in 1990, and to 13 years by 2000. Today, the average Air Force fighter is nearly 20 years old. Similarly, between 1955 and 2007, the average age of the Navy's fighter inventory increased from about 4 years to 13 years. This trend has been much less apparent in the case of Navy ships and submarines. Since 1980, for example, the average age of ships and submarines in the US Navy has increased only modestly, from about 14 years to 17 years. In terms of equipment aging over the past two decades, most other weapon systems fall somewhere in between these two extremes.

To some observers, this aging of the Services' weapons inventories is a source of considerable concern. One concern parallels the worry noted above that — because of rapid changes in technology (e.g., the stealth revolution) and operational considerations — it may be necessary to introduce relatively rapidly a range of next-generation weapon systems. In this case, the problem is not only that a particular weapon system is of an old design, but that the weapon system is itself relatively old.<sup>76</sup> On the other hand, since even relatively old weapon systems can be, and often are, retrofitted (through modification and upgrade programs) with improved capabilities (e.g., new sensors and PGMs), this distinction may not be especially important. In other words,

To some observers, this aging of the Services' weapons inventories is a source of considerable concern.

<sup>75</sup> C4ISR refers to a broad range of command, control, communications, computers, intelligence, surveillance, and reconnaissance systems.

<sup>76</sup> An illustration of this distinction may be helpful. The basic design of the F-16 fighter dates from the mid 1970s. However, the age of individual F-16s varies dramatically, since the aircraft has been in production for nearly three decades. Some F-16s in the Air Force's inventory are approaching 30 years of age and some are much newer.

As with the quality-quantity tradeoff, and decisions about how quickly new generations of weapon systems should be introduced, there is no single right answer to the question “How old is too old?”

if the effectiveness of the basic design of the weapon system is not undermined by technological developments (e.g., the stealth revolution) or other considerations, the actual age of the weapon system may not matter — at least so long as it can be kept in good operating order.

A second concern is that at some point it will, indeed, prove impossible to keep an aging weapon system in good working order — at least at reasonable cost. Furthermore, the high costs sometimes associated with operating old equipment can create a vicious cycle in which DoD, in the end, is left with insufficient resources to purchase the new equipment it needs. This is certainly a valid concern. At some point, all military equipment reaches an age where its O&S costs begin to increase significantly and/or it begins to suffer a substantial reduction in availability and reliability. This point may already have been reached for some weapon systems, and it will be reached for others over the next two decades. That said, the link between equipment age and O&S costs is less clear and more complex than sometimes recognized, as are the implications of this link for modernization plans and, particularly, the acquisition of next-generation weapon systems.

In a study of the impact of equipment age on O&M costs, CBO found that spending on O&M for aircraft tended to increase by 1–3 percent for every additional year of increase in age.<sup>77</sup> It also noted that under current plans some systems are projected to reach unprecedented ages and, if that happens, the rate of cost growth could accelerate.<sup>78</sup> On the other hand, CBO also found:

[N]o evidence to support the services’ contention that spending on O&M for aging equipment has driven [cost growth in] total O&M spending. Today, only about 20 percent of total O&M spending is devoted to equipment. And the fraction of O&M funds spent operating and maintaining equipment appears to be declining. Moreover, these services’ statements about growth in equipment costs are sometimes based on selective data, including anecdotal or partial data.<sup>79</sup>

The implications of the link between equipment age and operating costs are also complicated by the fact that, as noted earlier, next-generation weapon systems tend to cost more to operate and support than their predecessors. Thus, if the goal is simply to hold down or reduce operating costs, the Services would generally be better off replacing old current-generation weapon systems with new current-generation weapon systems, than buying next-generation weapon systems as replacements.

As with the quality-quantity tradeoff, and decisions about how quickly new generations of weapon systems should be introduced, there is no single right answer to the question “How old is too old?” in the case of weapon systems. In some cases, accepting

<sup>77</sup> Kiley, *The Effects of Equipment Aging on the Costs of Operating and Maintaining Military Equipment*, p. 2.

<sup>78</sup> Ibid.

<sup>79</sup> Ibid., p. 1.

a further aging of the weapons inventory — in order to help offset the very high costs traditionally associated with the acquisition of next-generation weapon systems and higher quality personnel — may make sense. In others, it may not.

## ACQUIRE LESS COSTLY WEAPON SYSTEMS

Advocates of the US military's traditional approach to modernization, with its focus on the acquisition of far more capable and costly next-generation weapon systems, argue that these new systems are so much more effective than their predecessors that they are clearly worth their high cost. At least implicitly, they must also argue that the acquisition of these new weapon systems provides a net increase in capabilities — even taking into account the price the Services have traditionally paid for these systems in terms of offsetting reductions in force size, the slower introduction of new weapon systems, and increasing equipment age.

In addition, again implicitly at least, advocates of the US military's traditional approach to modernization must argue that the particular weapon system acquired provides the most cost-effective quality-quantity tradeoff possible, given the current state of technology, the major missions for which the weapon is intended and other factors. In other words, they must argue that it would not, for example, be more cost-effective to acquire a somewhat less capable next-generation weapon system that would cost only, say, 50 percent more to acquire than the system it is intended to replace and — because of its lower cost — would necessitate smaller offsetting cuts in the size of the force, permit the more frequent introduction of new weapon systems, and/or allow for the maintenance of weapons inventories with lower average ages.

This may, in fact, be the correct judgment. It is important, however, not to lose sight of the fact that the preference US military planners have traditionally shown in favor of replacing current-generation weapon systems with far more costly next-generation weapon systems (at the cost of, among other things, sometimes substantial reductions in force size) is, indeed, a judgment. It is not preordained or inevitable. And, whatever the merits of this approach in the past, it may not represent the optimal approach, at least in all cases, in the future.

In the commercial sector of the economy, successive generations of new products generally include at least modest improvements in capabilities and, often, reliability. Yet, they do not necessarily cost more to acquire. Indeed, in many commercial sectors, including, for example, electronics and computers, over the past several decades acquisition costs have declined at the same time that capabilities and reliability have improved — and, in the case of computers, improved dramatically. There is nothing to prevent US military planners from taking a similar approach when acquiring next-generation weapon systems.

One example where DoD seems to be following something like this approach is with the LCS. The LCS, with its interchangeable modular mission packages, is intended to

replace three existing classes of ships: the *Perry*-class frigate and two classes of purpose-built minewarfare ships. The LCS will be only somewhat smaller than the frigate and much larger than the two minewarfare ships. It will also incorporate a wide range of technological advances that are absent from these 1980s-era ships. Nevertheless, at some \$500 million each the LCS is projected to cost roughly the same amount to procure as a *Perry*-class frigate.<sup>80</sup> And, altogether, it is projected to cost approximately the same amount to acquire the planned fleet of 55 LCSs as it did to procure the fleet of 56 ships it is intended to replace.

This same approach could, in theory, be taken in a broad range of other areas, including other Navy shipbuilding programs, as well as combat vehicle and aircraft programs. There are essentially three paths the Services could follow to acquire less costly alternative systems:

There are essentially three paths the Services could follow to acquire less costly alternative systems.

- > Existing current-generation systems could be replaced with next-generation systems of less costly design than those included in current plans. The LCS demonstrates that next-generation systems do not have to cost two-to-three times more than the systems they are intended to replace. In principle, there is no reason why more affordable next-generation combat vehicles, fighters and other systems could not also be developed and procured. Although these less costly next-generation weapon systems would presumably be less capable than the more costly next-generation systems called for in existing plans, they would, nevertheless, likely represent major improvements over existing current-generation systems.
- > Current-generation systems could be replaced with the latest versions of the same system (e.g., old F-16s replaced with the latest versions of the F-16 now being produced), rather than with next-generation systems (e.g., F-35s). Often these newer systems are far more capable than the earlier versions they would replace. These systems also tend to cost much less to produce than next-generation systems. For example, the latest and most capable version of the F-16, the F-16 Block 60, has a substantially higher unit procurement cost than earlier versions of the aircraft, but is still likely to cost far less than the F-35.<sup>81</sup>
- > Rather than buying either new current- or next-generation weapon systems, existing current-generation systems could be upgraded with new electronics and other equipment, and have their service lives extended. The cost of upgrade and modification efforts varies greatly, depending on how extensive the efforts are. However, even in cases where the systems are “remanufactured” (i.e., extensively rebuilt,

<sup>80</sup> According to CBO, the LCS is projected to cost about \$450 million per ship, exclusive of mission modules. The Navy estimates that each mission module will cost \$60 million. This suggests total unit procurement costs of some \$500 million.

<sup>81</sup> The F-16 Block 60 is estimated to have a unit procurement cost of some \$50 million, compared to an average of about \$28 million for earlier versions of the F-16 and about \$74 million for the Air Force version of the F-35. Kosiak and Watts, *US Fighter Modernization Plans: Near-Term Choices*, p. 12.

with major components replaced) and turned into essentially “zero-time” weapon systems (i.e., weapons with service lives comparable to those of new systems), overall costs tend to be at least somewhat lower than for new-production current-generation systems, and far less than for next-generation systems.

Although, historically, DoD has made some use of each of these alternative approaches, as in the past, the focus of existing modernization plans is on replacing current-generation weapons with much more capable and costly next-generation systems. As noted in the last chapter, in most cases, the Services’ modernization plans continue to be centered on the acquisition of next-generation weapon systems with unit procurement costs projected to be two-to-three times higher than those of the systems they are intended to replace. Those high cost programs include the DDG-1000 guided-missile destroyer and the CG(X) guided-missile cruiser, the FCS, and the F-22 and F-35 fighters.

In the case of the LCS, the Navy’s decision to take a different approach — to acquire a new ship that will cost essentially the same amount to procure as the ship it will be replacing — appears to be driven primarily by a belief that the importance of numbers, relative to quality, has increased in recent years and is likely to continue to grow. This belief follows from the view, discussed earlier, that among the most serious future challenges confronting the US Navy is the prospect that it might have to protect a large number of widely distributed chokepoints and other coastal areas against naval threats which, individually, might be relatively modest, but which, collectively, could overstretch and overwhelm the US fleet.

As noted earlier, because of the LCS’s relatively low unit procurement cost, the Navy expects to be able to replace the existing fleet of Perry-class frigates and minewarfare ships on essentially a one-for-one basis. This would mark a significant departure from the historical trend toward procuring and deploying progressively smaller numbers of ever more costly ships.

An important policy question is whether there are other force structure elements or mission areas for which it may make sense to adopt a similar approach to modernization today and in coming years — areas where, on net, the downside of accepting less of a leap in capability from one generation to the next would be more than offset by the upside of being able to afford greater numbers of systems.

One such area might be US ground forces. As discussed earlier, to the extent that the Army and Marine Corps begin to place a higher priority on irregular warfare missions in the future, it is likely to be more difficult for those Services to follow the traditional approach of paying for very costly modernization plans through offsetting cuts in force structure — given the importance for success in irregular warfare operations of having relatively large numbers of boots on the ground, as well as a substantial rotation base. However, while relatively more troops may be required for irregular warfare operations than for conventional combat operations, those forces may not

need to be armed with weapon systems and other equipment that are as capable, and costly, as that required for conventional military operations.

The centerpiece of the Army's current modernization plan is the FCS, a program that appears to be optimized for conventional military operations. As noted earlier, this system is extremely costly, with each FCS armored combat vehicle, for example, expected to cost several times more than the system it is projected to replace.<sup>82</sup> Equipment optimized for irregular warfare can also be costly. However, on net, it may cost substantially less to equip forces with the kind of capabilities needed to conduct effectively irregular operations than with the FCS. Thus, if the Army really wants to refocus its capabilities on irregular warfare, it might be better off canceling or substantially scaling back the FCS program and instead replacing its existing inventory of combat vehicles and other equipment with less costly alternative systems. Consistent with the discussion above, these could either be alternative (and less costly) next-generation weapon systems (e.g., the LCS approach), new current-generation systems, or remanufactured current-generation systems.

Although the focus of the above discussion is on how DoD could, if it acquired less costly new weapons systems, retain larger forces, that obviously would not be the only possible tradeoff. Alternatively, rather than being used to facilitate the retention of larger forces, paying less for the acquisition of new weapon systems could permit the US military to introduce new generations of weapon systems more frequently, or to keep the average age of its weapons inventory lower than would otherwise be possible.

## TRANSFORM THE MILITARY

Another way the US military could try to reconcile the prospective plans-funding mismatch that it faces is by transforming itself. There is considerable uncertainty and disagreement concerning what military transformation means, and whether or to what extent the US military is being or should be transformed, or how it should be transformed. However, a reasonable—and, for the purposes of this report, sufficient—definition is that military transformation is the act of combining new technologies, forms of organization and concepts of operations in order to create forces and capabilities that can address existing or emerging challenges more effectively and, in particular, more cost-effectively than can existing kinds of forces.

Past military transformations include, for example, the emergence of carrier-based aviation and combined-arms mechanized forces during World War II, and the nuclear weapons revolution. Today, supporters of next-generation weapon systems nearly always claim that the particular weapon system they are advocating is transformational. As noted earlier, most proposed next-generation weapon systems have

Another way the US military could try to reconcile the prospective plans-funding mismatch that it faces is by transforming itself.

<sup>82</sup> CBO, "The Long-Term Implications of Current Defense Plans," p. 12.

far higher R&D and unit procurement costs than their predecessors. This has led many observers, including both supporters and critics of the concept, to argue that transformation is, in budgetary terms, a very costly process.

However, while it may be true that acquiring certain transformational forces or capabilities is costly, on net, those forces and capabilities will generally be more cost-effective, and often dramatically more cost-effective. If that were not the case, if traditional, or “legacy,” forces were more cost-effective than transformational ones, military transformation would be nonsensical. Developing the atomic bomb was very costly, but it gave the United States a dramatically improved capability to carry out strategic bombardment — achieving that same level of capability through the expansion of its conventional bomber forces would have been far more (and, indeed, prohibitively) expensive in budgetary terms. Likewise had the US Navy continued to rely on battleships, rather than rapidly shifting to aircraft carriers, in World War II, it would have found its budgetary requirements dramatically greater and, worse yet, would have almost certainly lost the naval war with Japan.

One reason that some observers may assume that military transformation is a very costly process is because they conflate the cost of transforming military forces with the cost of expanding capabilities. If the required level of capability is held constant — allowing for an “apples-to-apples” comparison of transformational versus legacy forces — effectively transformed forces should always be less costly (i.e., more cost-effective) than legacy forces. Put another way, if the goal is simply to maintain the same level of capability possessed by legacy forces, shifting to transformational forces should allow a reduction to be made in the size of those forces that will, in turn, produce cost savings. On the other hand, if a decision is made to take advantage of the enhanced capabilities possible with transformational forces, shifting to those forces may result in little or no cost savings, and could even lead to cost growth if a decision were made to greatly expand the military’s capabilities. But such cost growth (or failure to generate cost savings) cannot reasonably be attributed to the process of transformation.

Moreover, historically, transformational capabilities have often cost less to acquire and support than the legacy systems and forces they displaced. This was, for example, the case with the long bow (which rendered heavily armored knights obsolete) and the submarine (which displaced surface combatants in the commerce-raiding role).

A wide range of candidates has been suggested as offering opportunities for effective military transformation over the next two decades. Among the candidates frequently mentioned are space weapons, unmanned combat air systems (UCAS), other (e.g., ground- and underwater) unmanned systems, precision-strike weapons of various types, and a range of improved C4ISR assets. Determining or even discussing which, if any, of these candidates is likely to prove truly transformational (i.e., result in more cost-effective forces), is beyond the scope of this report. However, if one or more of these candidates do prove successful, it could have significant implications for the cost-effectiveness, and thus budgetary requirements, of the US military.

A wide range of candidates has been suggested as offering opportunities for effective military transformation over the next two decades.

In a 2005 study, CBO provided a preliminary assessment of how taking a more transformational approach to defense planning and programming might allow DoD to reduce its funding requirements.<sup>83</sup> Among other things, CBO’s transformational option included much greater use of unmanned combat aircraft systems (UCAS). CBO estimated that, assuming these and other transformational technologies could be made to work effectively, the Services might be able to achieve substantial savings. Specifically, CBO estimated that pursuing a more transformational force structure and modernization plan could generate savings over the long run approaching some \$50 billion annually, with those savings divided roughly equally between O&S activities and acquisition programs.<sup>84</sup>

CBO’s consideration of the potential for UCASs and other systems to transform the US military and reduce funding requirements should not be taken as an endorsement of such a transformation. Many questions remain concerning, for example, both the cost and effectiveness of UCASs and their ability to substitute effectively for manned aircraft, especially in some of the most difficult combat missions. However, the CBO study provides a useful illustration of how some types of significant transformation of the US military could generate savings that could help it eliminate its prospective plans-funding mismatch.

In addition to the options discussed above, there are a number of other approaches DoD could pursue to help eliminate the prospective plans-funding mismatch.

## OTHER OPTIONS

In addition to the options discussed above, there are a number of other approaches DoD could pursue to help eliminate the prospective plans-funding mismatch. One option would be to improve the efficiency of DoD’s acquisition, O&S and other activities. Among other things, it might be possible to improve DoD’s efficiency by reforming the weapons acquisition process, opening more infrastructure functions (e.g., base operations, logistics and depot maintenance) to competition from private sector contractors (“competitive sourcing” or “outsourcing”), and more widely and rapidly adopting a range of “best practices” in the department’s business operations.<sup>85</sup> Over the years, a wide range of government panels, study groups and others have argued that substantial – even dramatic – savings could be generated through the implementation of these and other reforms. The successful implementation of such changes, thus, could lessen – or even obviate – the need to make the kinds of tradeoffs discussed in this chapter.

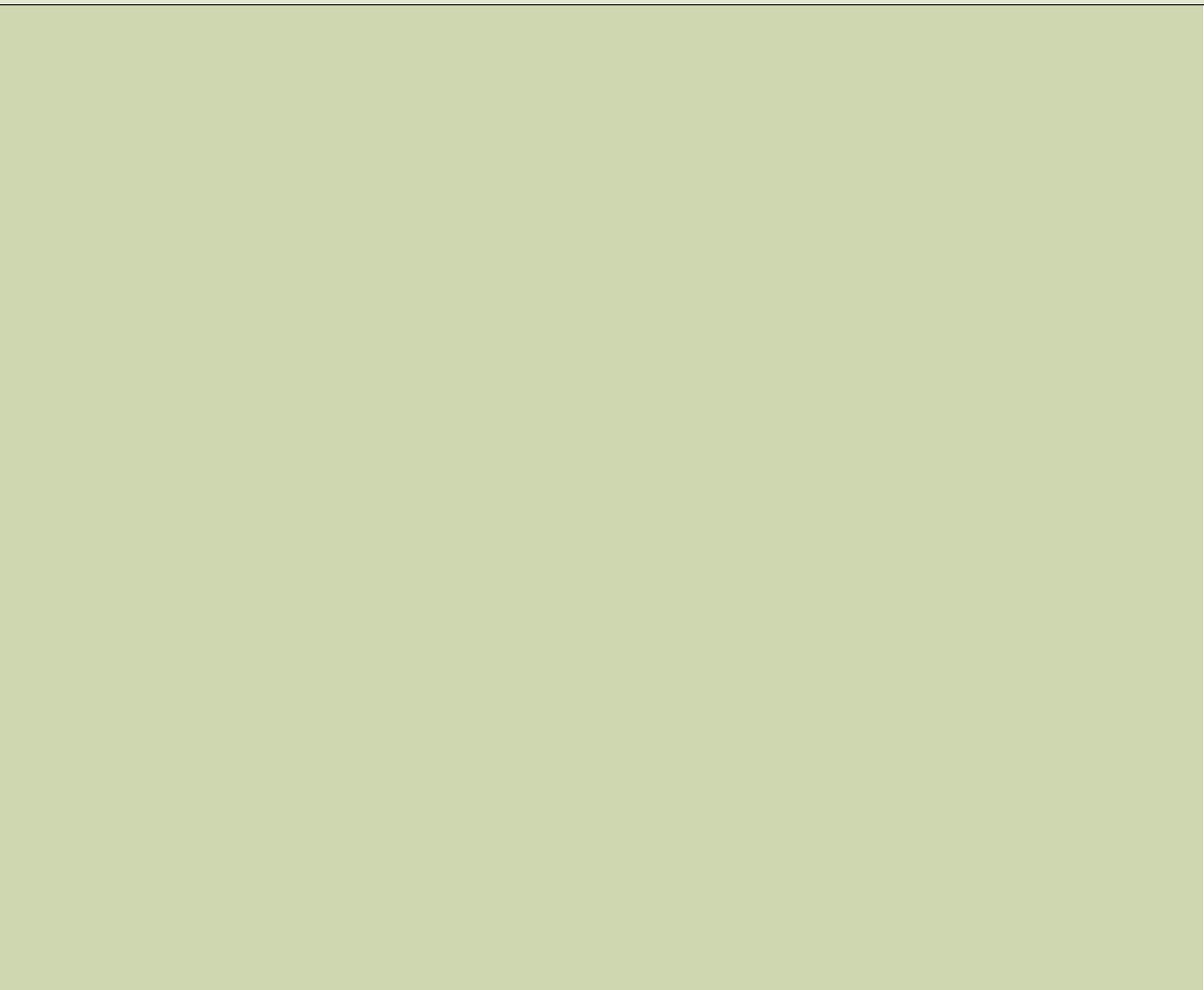
<sup>83</sup> Adam Talaber, *The Long-Term Implications of Current Defense Plans and Alternatives: Summary Update for 2006* (Washington, DC: CBO, October 2005).

<sup>84</sup> *Ibid.*, pp. 15–21.

<sup>85</sup> For a discussion of various possible approaches to improving the efficiency of DoD, see Robert F. Hale, *Promoting Efficiency in the Department of Defense: Keep Trying, But Be Realistic* (Washington, DC: Center for Strategic & Budgetary Assessments, 2002).

Unfortunately, history strongly suggests that — while DoD should certainly continue to pursue efficiency improvements — it should not count on such reforms to eliminate projected funding shortfalls. Depending on these kinds of changes to address its prospective plans-funding mismatch is likely to lead DoD simply to defer making difficult choices and tradeoffs.

Another option would be for the Services to forego their traditional preference for high-quality personnel. This option is not discussed in detail here because it would run counter to DoD's approach of the past 30-plus years (since the advent of the AVF) and because, given the importance of personnel quality, such an approach would probably lead to a significant decline in military effectiveness. However, this option could potentially lead to substantial budgetary savings.



## CONCLUSION

The US defense budget has grown dramatically over the past eight years and it is today at near record levels. Much of this growth stems from US involvement in the wars in Afghanistan and, especially, Iraq. However, even the base defense budget has grown substantially in recent years. It is impossible to predict with much confidence what is going to happen to defense spending over the next two decades. Few predicted the deep reductions in defense spending that occurred beginning in the second half of the 1980s and continued through the mid 1990s, or the great boost that the defense budget has experienced since 2000.

Nevertheless, for planning purposes, it is necessary to make some assumption about future levels of funding for defense. As discussed in Chapter I of this report, the best available evidence suggests that the defense buildup that began in the late 1990s, and was greatly accelerated after the terrorist attacks of 9/11, is not likely to continue much longer. By historical standards, this is already a very long buildup. The Bush Administration's own defense plan shows the base defense budget staying essentially flat through 2013, the last year of its latest FYDP. Likewise, the history of past increases in the base defense budget suggests that the next 20 years is likely to be a period of relatively modest growth or even decline. Finally, fiscal pressures related to the retirement of the baby boomer generation and rising healthcare costs seem likely to constrain defense and other federal spending in coming years.

Thus, for planning purposes, the most reasonable and prudent assumption to make may be that the base defense budget will remain essentially flat in coming years. As difficult as it is to accurately predict future funding in the base defense budget, it is even more difficult to predict future funding levels for military operations. But for a variety of reasons, the best guess is probably that war-related defense spending will begin to decline over the next few years. In any case, although DoD has, in recent years, used war-related supplemental appropriations to fund some base budget programs and activities, the lion's share of that funding has been in the

past, and will likely continue to be in the future, needed to cover the cost of ongoing military operations.

While the best guess is probably that the base defense budget will stay relatively flat over the next two decades, as discussed in Chapter II, fully implementing DoD's current long-term defense plan would likely require achieving and sustaining a major increase in the defense budget, well beyond today's level. The sources of this budget pressure include cost growth in both O&S activities — including, for example, military pay and healthcare — and weapons acquisition programs. If history is any guide, these costs will increase more rapidly and substantially than assumed in DoD's plans. As a result of these two divergent trends (on the one hand, a flattening of the defense topline and, on the other, the likelihood of significant growth in the cost of executing DoD's long-term force structure, modernization and readiness plans), prospectively, DoD appears to suffer from a substantial plans-funding mismatch.

DoD has been confronted with similar mismatches in the past. Chapter III of this report described a number of the options DoD has most frequently employed, historically, to help eliminate such mismatches, as well as several options that represent somewhat more innovative approaches.

Over the past 50 years, at least, DoD has often responded to budgetary pressures by cutting the size of the military, reducing the frequency with which new weapon systems are introduced, or keeping weapon systems in service for longer periods of time. It has only been by making these kinds of tradeoffs that the US military has been able to sustain its long-term preference for buying successive generations of weapon systems that cost far more than their predecessors — in terms of both development and unit procurement costs — and recruiting and retaining progressively more costly military personnel.

Implicitly, at least, DoD has argued that this approach represents the most cost-effective way to maximize the capabilities of the US military. The US military has become progressively smaller over time, slowed its rate of modernization, and accepted a generally older weapons inventory. But each new generation of new hardware it has acquired has generally marked a major (sometimes, dramatic) improvement over its predecessor, and the quality of its personnel has also improved. In short, over time, it has, more and more, traded off quantity for quality

In some cases, it may well make sense to continue to make these kinds of tradeoffs. Given how much more capable the Services argue the F-22 and F-35 fighters are, for example, it may make sense to replace current-generation systems with those fighters on far less than a one-for-one basis. Similarly, to the extent that combat effectiveness has become increasingly dependent on PGMs, sensors and other electronics that can often be carried by, or retrofitted onto, existing weapons platforms, the age of those platforms may continue to become less important. In other cases, continuing to make such tradeoffs may not make sense. For example, because of the importance of numbers (of units and personnel) for stability and similar operations, it may not

be appropriate for the Army and Marine Corps to make the same kind of quantity-quality tradeoffs they, like the other Services, have traditionally made in the past.

In addition to these “business-as-usual” options, the Services could also choose to eliminate the prospective plans-funding mismatch through two other approaches, also discussed in Chapter III. These include buying less costly next generation weapon systems and transforming the military. Although today new weapon systems typically have development and unit procurement costs two to three times greater than their predecessors, such cost growth is not inevitable. If, in the future, the Services were to buy next-generation weapon systems that cost the same, or even moderately (rather than dramatically) more, to develop and procure than the systems they are intended to replace, they could avoid some of the tradeoffs they have traditionally had to make in terms of, for example, accepting progressively smaller forces or older weapons inventories.

The Services might also be able to avoid some of these traditional tradeoffs if they were able to transform their forces. In the past, military transformations, such as transitioning from a battleship-centric navy to one organized around aircraft carriers during World War II, have led to dramatic improvements in cost-effectiveness.

In the end, which of the various options available for addressing DoD’s prospective plans-funding mismatch is likely to prove most appropriate will have to be determined on a case-by-case basis. There is no “one-size-fits-all” approach that can simply be applied across the board. And, ultimately, it may not be possible to meet satisfactorily US national security objectives and requirements without further increasing the level of resources allocated to defense. However, these approaches have been used consistently in the past to help resolve projected gaps in DoD funding.



## **Acknowledgments**

The author would like to thank the CSBA staff for their assistance with this report. Special thanks go to Charlotte Brock and Eric Lindsey for their editorial and production support.

The analysis and findings presented here are solely the responsibility of the Center for Strategic and Budgetary Assessments and the author.

**Center for Strategic and Budgetary Assessments**

1667 K Street, NW, Suite 900

Washington, DC 20006

Tel. 202-331-7990 • Fax 202-331-8019

[www.CSBAonline.org](http://www.CSBAonline.org)