1 Introduction

The US defense economy is remarkable for its institutional peculiarities and sheer size. In 2019, with global defense expenditures estimated at $1.9 trillion,\(^1\) US defense expenditures, at around $737 billion, accounted for approximately 39% of the global total (SIPRI, 2020a). The US Department of Defense (DoD) budget dwarfs the budget of the second largest spender, China, estimated at $250 billion for 2018 in 2018 US dollars. China is followed by Saudi Arabia at $68 billion, India at $67 billion, France at $64 billion, and Russia at $61 billion. Even though the DoD budget has been increasing in absolute numbers, it has been decreasing as a percentage of US GDP. Figure 1 illustrates the gradual decline from the Korean war to the present and projects the data to 2025.

The defense economy also has a significant international footprint. The United States is, and has been, the world’s leading exporter of defense goods and services; it is also a major arms importer. However, imports are on a much smaller scale, due, inter alia, to strong “Buy American” preferences thoroughly embedded in legislation, policy, and politics. A 2018 US Government Accountability Office (GAO) report estimated that “in fiscal year 2017, foreign end products accounted for less than 5% – about $7.8 billion – of federal obligations for products potentially subject to the Buy American Act” (US Government Accountability Office, 2018, p. 12).

The underlying relationships of a defense economy and its resource allocation are significantly different from those for a textbook market economy. This element will outline the U.S. defense economy and its components. The first section is an overview of the defense economy – identifying the essentials, including the roles of the various players. The second section will address defense resources: to include past experience; the decision-making processes; and the role of the planning, programming, and budgeting process in defense resources allocation. The third section covers the defense marketplace and peculiarities associated with the government’s sovereign monopsony. The fourth section regards a rather detailed discussion of defense industrial consolidation post-Cold War – to include assessments of the results. Next (the fifth section) is a discussion of the limits and burdens of a sovereign monopsony. Finally, we consider that the defense economy is a dynamic environment that is driven, inter alia, by rapid changes in defense technology and the state of military affairs.

2 Economics of US Defense: An Overview

2.1 Major Components of the Defense Economy

The key to understanding the defense economy is knowing the major players and the characteristics that differentiate the defense economy from the general economy.

\(^1\) All expenditures converted to US dollars at prevailing exchange rates.
However, the boundary between the defense and nondefense sectors is fuzzy at best. For example, the military forces have both the active and reserve components. To what extent are reservists a part of the defense establishment and defense economy or the general economy? Employment in defense industries is even more difficult to estimate. Some firms sell only commercial products to both defense and commercial customers. Most firms that are clearly in the defense economy nonetheless also have commercial sales. This lack of clear demarcation is indicated in the wide range of estimates for defense industry employment (e.g., Hartley, 2017, esp. p. 33), which appears in Table 1.

With that reservation in mind, Figure 2 depicts the basic structure and flows of the defense economy. The main players are households that provide resources to support national defense (a public good); the federal government – executive, legislative, and judicial branches (the purchasing agent); and the Defense Industrial Base (DIB; the defense firms who also do business in the international market). The interactions between the players determine the resources raised for national defense and their allocation among defense needs.

Figure 1 DoD spending as a percentage of GDP

Source: DoD spending as a percentage of GDP compares DoD outlays, both discretionary and “mandatory,” from the National Defense Budget Estimates for fiscal year (FY) 2020 (table 7-7) and projected GDP from OMB’s Economic Assumptions for the FY 2021 (Office of the Under Secretary of Defense, 2020a)

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<table>
<thead>
<tr>
<th>Data source (year)</th>
<th>Defense industrial</th>
<th>Commercial aerospace</th>
<th>Total direct</th>
<th>Indirect</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIA (2018)</td>
<td>355</td>
<td>488</td>
<td>843</td>
<td>1,587</td>
</tr>
<tr>
<td>Deloitte (2016)</td>
<td>845</td>
<td>331</td>
<td>1,233</td>
<td>2,909</td>
</tr>
</tbody>
</table>

**Sources:** AIA (2018, esp. p. 1); Deloitte (2016, esp. p. 5)
However, a significant part of the defense market is for defense-specific goods. The federal government is the sole customer of most defense-specific goods and services, and makes the rules for how that market operates. Additionally, defense goods and services are generally produced to a government-determined set of specifications or “requirements,” for which the government pays development costs.

As the sole customer\(^3\) (monopsonist) for defense-specific goods and services, the federal government is also a sovereign monopsonist,\(^4\) defining market

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\(\text{Notes:}\) \(^a\) The federal government provides national defense (a public good) to its citizens (the “households”). To do this, it collects taxes from the households (and incurs debt on their behalf). It also hires, and pays, a defense work force – military and civilian. The government also purchases commercial goods and services (e.g., office supplies) from the general economy. \(^b\) A sector of the economy (defense industry) supplies defense-specific goods (e.g., warplanes) and services (e.g., research activities). \(^c\) The government also participates in the international defense market. It imports defense goods and services, and, since government controls military exports, it is the international sales agent for the defense industry.

\(^3\) Even though the United States exports military goods and services, the US government is nonetheless the most significant and, in many cases, the only customer. For specialized defense products, the US government almost always defines the product and pays for development costs. The defense products may be made available for export. Also, the government can veto virtually any arms sale abroad – through its various arms export authorities (discussed later on in the context of the export control regime).

\(^4\) A good alternate term for “sovereign monopolist” is “customer, sponsor and regulator” (Heidenkamp et al., 2013).
structures, rules, and norms. Accordingly, any discussion of the US defense marketplace must pay attention to rules and policies, and their effects. Figure 2 demonstrates the central position of the federal government, necessitating the need to understand government players, institutions, and processes. A rather lengthy and complicated set of processes starts with assessment of defense needs and translation of needs to defense resources. Basically, the Executive Branch, through the Planning, Programming, Budgeting, and Execution System (PPBES), starts with a strategy and ends with the President’s Budget (PB) submitted to Congress. The Congress receives the PB, and proceeds to formulate authorization and appropriations bills for national defense in the coming fiscal year. The judiciary resolves disputes. In particular, the courts have been involved in bid-protest litigation.

But there is another set of players not included in Figure 2 that are involved in the defense economy. These are the organizations that analyze defense policy and resource questions – and contribute to ongoing policy deliberations. The following are offered as representative examples.

2.1.1 Agencies within the Executive and Legislative Branches

- Executive
  - Organic to the services or reporting to the Secretary of Defense
    - Cost Analysis and Program Evaluation (CAPE)
    - studies and analysis groups within service staffs
    - research arms of various military educational institutions like the Naval Postgraduate School

- Organizations closely affiliated with the services or DoD
  - the RAND Corporation
  - Institute for Defense Analysis
  - Center for Naval Analysis

- Legislative
  - Congressional Budget Office (CBO), Congressional Research Service, and GAO.

- “Think tanks,” such as the Lexington Institute, with ties to defense industrial firms; and independent organizations such as the Brookings Institution, American Enterprise Institute, Hudson Institute, Heritage Foundation, Federation of American Scientists, Center for Strategic and Budgetary Analysis, and Center for a New American Security
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• A number of periodicals such as *Air Force Magazine*, *Naval Institute Proceedings*, *Marine Corps Gazette*, *ARMY Magazine*, *National Interest*, and *National Defense*.

These “auxiliary” participants in the defense economy are well represented in our list of sources.

2.2 Goals of the Defense Economy

The defense economy provides the material means for “national defense,” which immediately begs two questions: (1) against what threat or threats, and (2) how much defense is actually provided with the resources committed? Hitch *et al.* (1960) answered the first question primarily with come-as-you-are contingencies: nuclear confrontation and conventional warfare at various levels of intensity (pp. 11–14). Their answer to the second question depends on the following (Hitch *et al.*, 1960, pp. 3–4):

• How much is available for defense?
• How much of what is available is allocated to defense?
• How well are those resources used?

For how much is available, Hitch *et al.* (1960) cited the size of GDP, present and future (pp. 28–40). How much is allocated belongs generally in the realm of politics, broadly defined. How well the resources are used concerns efficiency of resource use, the major theme of their work (see esp. pp. 1–14). Moreover, the allocation of defense resources can be a question of governmental politics as much as resource allocation as economists generally understand it.

One major goal of Hitch *et al.* (1960) was to provide a better framework for defense resource allocation – oriented toward programs and associated capabilities rather than objects like military hardware (pp. 49–51). The result was a system of programs organized in a hierarchy of resource packages. This system, changed somewhat, is still the heart of DoD resource allocation.

During the Cold War, the major threat was the Soviet Union, with some lesser contingencies added. Life has since become much more complicated. US defense planning must now account for a large number and variety of threats and adversaries. These include peer or near-peer rivals such as China and Russia, nuclear-armed smaller powers primarily North Korea and Iran, and a constantly changing and evolving set of insurgent movements, such as Al Qaeda and ISIS, and other non-state actors like Hezbollah and narcotics cartels. They are generally well-resourced, imaginative, resilient, and adaptable.

5 In our opinion, the best one-volume discussion of these threats appears in *The Dragons and the Snakes* (Kilcullen, 2020).
3 Resources for Defense

3.1 Past Allocations to National Defense

While a larger economy has more resources available, *ceteris paribus*, there are other relevant considerations. As Hitch *et al.* (1960) point out, resources for defense carry an opportunity cost in other public needs foregone (e.g., p. 4). How much of GDP is available in the twenty-first century for federal government purposes? A practical answer appears to be 20%+, in “normal” times.

The federal portion of GDP is likely to change slowly over the next decade – with the COVID-19 recession being a wild card. What has also happened is that the “human resources” portion of the federal budget has increased steadily and significantly. At the same time, the defense share of GDP (and fraction of federal expenditures) has decreased. In the mid-1950s, defense accounted for about 10% of GDP, and is now about 3.5%. So, while resources for defense increase in response to assessed threats, resources for defense, as a fraction of GDP, have steadily decreased in the long run – as shown in Figure 3.

Furthermore, it is reasonable to expect that the portion of GDP available for defense will continue to decline for the foreseeable future. The human resources portion of the federal budget will continue to increase with an aging population. Of course, the COVID-19 epidemic, with its expensive mitigation programs, will increase national debt and debt service as a fraction of GDP, with further pressure on “discretionary” categories like defense.

![Figure 3](https://example.com/figure3.png)

*Figure 3* Federal outlays by category (1956–2020)

**Note:** In US Office of Management and Budget parlance, “human resources” is a budget superfunction. The constituent functions are education, training, employment, and social services; health; Medicare; income security; social security; and “various benefits and services.”

**Source:** US Office of Management and Budget (2020) FY 2021
Between 2019 and 2030, federal expenditures are expected to increase from 20 to 23% of GDP; but growth in the percentages for mandatory programs and net interest payments reduce the discretionary portion of federal spending to 5.8%, with 2.9% going to defense in 2030 versus 3.5% in 2020 (Congressional Budget Office, 2020).

**Figure 4** National defense real outlays
Post-2001, DoD funding is divided into base and non-base funding. Base funding supports daily military and civilian operations and includes the development and procurement of systems – basically all normal peacetime activities

**Note:** FYDP, Future Years Defense Program

**Source:** Congressional Budget Office (2019); US Office of Management and Budget (2020)

**Figure 5** US arms trade by region (2014–2019)

**Notes:** Regions per US DoD combatant command areas of responsibility. a Millions of SIPRI TIVs (trend indicator values). TIV is an SIPRI arms export measure, which assigns “values” for different categories of military goods. It is intended to better measure the military implications of any transfer, rather than financial value of transactions (SIPRI, 2020c, section 2). b Percentage of total exports.

**Source:** SIPRI (2020b)

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3.2 The Defense Economy’s Footprint

The US defense economy depends for the most part on government expenditures. Figure 4 shows real defense expenditures from 1980 to 2034. One can observe four “eras.” First was the later Cold War in the 1980s. Second was a post-Cold War decline with an associated “procurement holiday” in the 1990s. With a lot of new equipment in hand from the 1980s buildup, the natural place to cut spending was in procurement (Wayne, 1998a) (see also Figure 6). The third featured various contingency operations following the World Trade Center attacks in 2001; and fourth, the Budget Control Act of 2011.

In the post 2001 era, the Total Obligation Authority (TOA) included annual allowances for Overseas Contingency Operations (OCOs) over and above the “base” DoD budget. The difference between the upper and lower line in Figure 4, the base budget, reflects this.

The base budget appropriations categories are:

- military personnel, which covers pay, cash benefits, costs of retirement benefits, and the military health system for military personnel and retirees (Figure 7);
- operation and maintenance, which includes the pay, cash benefits, costs of retirement benefits for civilian employees of DoD, and costs such as fuel, base maintenance and operations, and spare parts;
- procurement, research, development, test, and evaluation (RDT&E), which is used to develop and purchase new systems, to upgrade existing systems, and develop future systems (Figure 8);
- military construction;

![Figure 6 Base and OCO funding for the DoD](image)

**Note:** FYDP, Future Years Defense Program  
**Source:** Congressional Budget Office (2019)
The costs for military personnel and operations and maintenance constitute approximately two-thirds of the DoD’s total budget request.

Non-base funding is referred to as OCO funding and is considered a form of emergency funding for what are intended to be temporary activities, such as the wars in Afghanistan and Iraq. Figure 4 details the base and OCO funding for the DoD. The difference on the graph between the total budget and the base budget represents OCO funding.

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Figure 7 Funding for the DoD: Acquisition and operations

Source: Congressional Budget Office (2019)

Figure 8 DoD acquisition funding

Source: Congressional Budget Office (2019)

- family housing;
- revolving and management funds (Congressional Budget Office, 2019).[^6]

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[^6]: Revolving funds are established to finance a continuing cycle of business operations. Revolving fund accounts are authorized to be credited with receipts, incur obligations, and make expenditures. Fund collections are normally available for obligation and expenditure without further action by the Congress.