

Rallying the Troops: How the United States Government and Big Defense
Spread Love for Missiles

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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War is not a new concept in American politics, nor is opposition to militarization. The Cold War taught that perhaps bigger weapons could limit war under the threat of mutually assured destruction, and this lesson prevails today as a justification for nuclear stockpiling. The United States government and its defense contractors spend billions annually on a state-of-the-art weapons arsenal. At the peak of the Cold War there were over 70 American product suppliers, and today there are 5 prime contractors: Lockheed Martin, Raytheon Technologies, The Boeing Company, General Dynamics, and Northrop Grumman. The Department of Defense (DoD) pledged \$22.28 billion in awards and contracts to the primes and other companies in 2023, and the DoD budget as a whole surpassed \$1 trillion, yet the American public continues to voice concern over federal spending on weapons development (USAspending, 2023).

President Eisenhower warned of the unrestrained power of the industry in his 1961 farewell address, coining the term “military-industrial complex” to describe the relationship between the government and its defense suppliers. He stated, “... This conjunction of an immense military establishment and a large arms industry is new in the American experience. . . . Yet we must not fail to comprehend its grave implications. . . . In the councils of government, we must guard against the acquisition of unwarranted influence, whether sought or unsought, by the military-industrial complex. The potential for the disastrous rise of misplaced power exists and will persist” (Eisenhower, 1961). While the danger of the military-industrial complex (MIC) is disputable, its existence as an entity today is not. Americans who oppose the MIC point to the mammoth budget and the moral implications of developing and using weapons of war. The budget has moral implications itself, as money might otherwise address social welfare issues. In the age of artificial intelligence, autonomous weapons systems create unique ethical dilemmas.

Behind every computer is a person, and without appropriate legal or philosophical frameworks, the individuals behind autonomous weapons hold immense power.

Key players on both sides include the 5 prime contractors, the DoD, engineers who work in defense, advocacies such as Win Without War, and political factions such as the Blue Dog Coalition. Win Without War represents those who feel nuclear weapons are unethical, while the Blue Dog Coalition represents an unlikely left-wing supporter of funding the DoD. The MIC employs several strategies to manage moral concerns while carrying out its agenda, though existing criticism suggests management does not equate to mitigation. The defense industry promotes itself as a top-tier employer carrying out the patriotic mission of protecting America, and a longstanding, impenetrable relationship with the federal government protects private contractors from backlash.

Review of Research

Philosophical theories, political context, and the technological capacity of weapons are among relevant factors in forming a judgment on the defense budget. To better grasp the intangibles, several experts have studied theories of ethics related to war and defined new terms for the American war machine. Just War Theory is highly regarded as a military tradition, and Kantian nonideal theory helps to explain why wars happen and how to navigate them ethically. Forge (2009) applies the proportionality principle of Just War Theory to weapons innovation by considering the misuse of weapons that were once defensive in nature by future customers. He states, "If [a scientist's] country is under threat of aggression and he wishes to use his special expertise as a scientist to develop new weapons to resist that aggression, he cannot be assured that they will not be used at some later date in precisely the opposite way, to threaten aggression

against some innocent party” (Forge, 2009). Forge’s interpretation of Just War Theory does not condemn the production of weapons as unjust, since future use of weapons might have benefits which balance the costs. Kantian nonideal theory also allows for nuclear proliferation, and Doyle (2010) argues that Iran could morally stockpile nuclear weapons, despite the Nuclear Nonproliferation Treaty. Under nonideal theory, states can take “impermissible” acts to prevent worse injustices. Doyle writes, “Unfortunately, the fact of nonideal conditions makes it impossible to sometimes avoid putting humanity’s rights at risk in the pursuit of legitimate self-defense”.

Aside from theories, prior researchers have investigated the relationship between private defense companies and the US government, building off of Eisenhower’s military-industrial complex. Adams (1981) wrote of the “Iron Triangle” in a book which studied the 8 prime contractors at the time: Boeing, General Dynamics, Grumman, McDonnell Douglas, Northrop, Rockwell International, United Technologies, and Lockheed. He defined the Iron Triangle as a relationship between federal bureaucracy (DoD, NASA, etc.), Congress members, and “private interest” (firms, labs, trade associations, and more). The term evokes the notion of a powerful dynasty which “excludes outsiders and alternative perspectives” (Adams, 1981). The iron triangle limits the power of the public to invoke change. In the throes of World War II, Gallup (1942) wrote about the importance of public opinion during wartime. Using polls on the transition from land power to air power in the 1930s as an example, Gallup proposed that the American people are ahead of their political leaders on war-related issues. Eighty percent of the American public favored a larger Air Force in 1935, while military experts disagreed until long after Hitler’s regime conquered Europe (Gallup, 1942).

Just War Theory and Kantian nonideal theory do not directly address the development of nuclear weapons in America, but they serve as a framework for making complex ethical decisions. The defense industry advertises its mission as threat response, and assuming the United States uses weapons as a proportional threat response, production does not inherently violate Just War Theory. Doyle's interpretation of Kantian nonideal theory defends nuclear proliferation in Iran, and by extrapolation, the theory defends the actions of the US. However, Forge and Doyle's work does not absolve the MIC. Win Without War is one of many organizations that distrust the defense industry's mission, citing inefficient use of funds and disproportionate responses to external threats. Adams' Iron Triangle exists today, and a strong relationship with federal bureaucracy and Congress allows defense contractors and the industry at large to thrive in spite of distrust. When analyzed together, Forge, Doyle, Adams, and Gallup's works provide a toolkit for understanding how the DoD manages external pressure.

The Quiet Voices of Dissent

Even with substantial cuts, the defense budget would be glaring. The 2023 \$1.8 trillion dollar total represents 13.2% of the United States federal budget (USAspending, 2023). Much of the sum went to contracts and obligations, while the rest served the armed forces. More specifically, the department spent \$34 billion to sustain and modernize nuclear weapons, \$56 billion on air powered platforms and systems, \$40 billion on naval products, \$13 billion to modernize land forces, and \$130 billion for research and development in Fiscal Year 2023 (Lopez, Oct. 2022). Several organizations argue that the DoD uses its impossibly large endowment— money which could otherwise support the welfare of the American people— inefficiently. An underlying, partisan divide on spending stems from ideological differences on

the morality of war. America’s reputation as the global police force comes with a cost, and part of the DoD’s job is to convince the public that the cost is justified.

Pentagon critics and pacifist advocacy groups distrust federal leadership, further complicating efforts to defend the budget. Win Without War is one group who calls for peaceful foreign policy, and their publication, “Throwing Money at the War Machine: 5 cases of Pentagon Waste”, calls out the Pentagon for its inability to pass an audit while dragging defense contractors for the compensation their CEOs receive as a result of federal funding (Win Without War, 2021). Defense contractors tread a fine line between private company and federal entity, and the lucrative nature of defense work can appear antithetical to the mission of serving the public. Some engineers who work in the industry echo Win Without War’s concerns. A Reddit user by the name “Emotional_Eggplant51” posted the following poll to the r/AerospaceEngineering thread (fig.1):

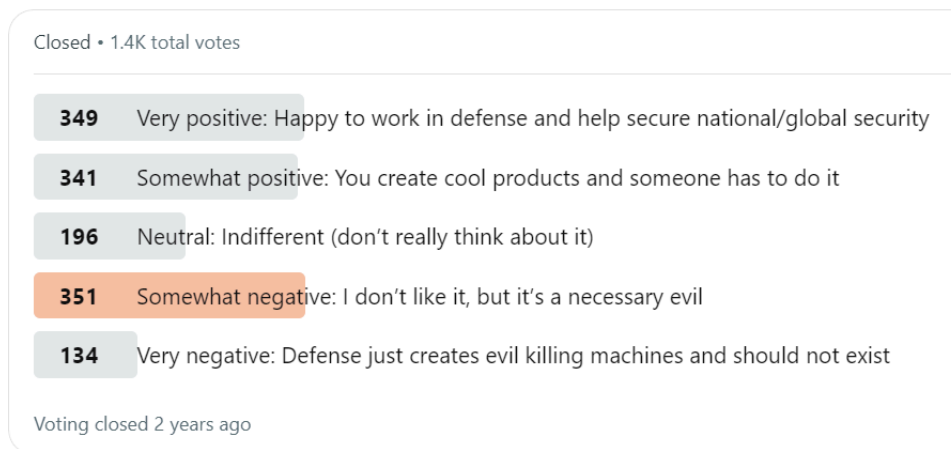


Figure 1. Reddit poll ([Emotional_Eggplant51], 2022)

In the comments, user “Invent” wrote, “Sold my soul for this, first years of my engineering life spent developing "weapons to fight terrorism" and "save American lives". Most missions apparently killed children and innocent families in their homes” ([Invent], 2022). Invent’s

statement is impossible to corroborate, but it represents the sentiments of a large faction of people who believe that defense is not truly *defense*. On a separate thread called r/AskEngineers, user “Dudestorm”, wrote “I wouldnt have a problem making defense items if I trusted the guy pulling the trigger. I don't trust some 18 year old kid with a hand cannon... following orders effectively coming down from some politician, all while "defense" is taking place in some other country” ([Dudestorm], 2013). The MIC can hardly console those who distrust politicians or oppose the use of weapons altogether, but the defense industry takes separate strides to market their work as patriotic and just.

Military Glory: Protecting the Homeland

Codes of ethics not only remind engineers of the consequences of their work, but serve as a public relations strategy for companies to demonstrate how they hold their employees accountable. The American Institute of Aeronautics and Astronautics (AIAA) functions as both a technical society and a governing body for professionals in the aerospace field. By joining AIAA, engineers pledge to “Hold paramount the safety, health, and welfare of the public in the performance of their duties”, according to the organization’s code of ethics (American, 2023). Defense is specifically relevant to the welfare of the American public, but the statement addresses the future use of all engineering products. The Department of Defense releases ethics directives on specific activities for all of its branches. In 2022, the DoD published the Civilian Harm Mitigation and Response Action Plan, which outlines an approach to mitigating, assessing, and responding to civilian harm caused by the military. In regards to the plan, Pentagon Press Secretary Air Force Brig. Gen. Pat Ryder stated, “...The protection of civilians is fundamentally consistent with the effective, efficient and decisive use of force in pursuit of U.S. national

interests...” (Lopez, Sept. 2022). The DoD also recognizes ethical concerns about autonomous weapons technology, updating DoD Directive 3000.09 in 2023 to ensure that all weapons with autonomous functions are employed responsibly, in accordance with the laws of war and applicable treaties (Garamone, 2023). Contractors, too, strive to echo the sentiments of the AIAA code of ethics in their own. Raytheon has a Human Rights Policy that addresses how defense products affect civilians in America and across the globe. It states, “...we monitor and evaluate our impact on human rights through due diligence and other measures and take actions designed to mitigate such impact” (Raytheon, 2022). Beyond pledging to act ethically, the defense industry constantly reminds the public why weapons are a necessary evil.

Defense contractors and the government promote weapons development as a patriotic duty and view a strong stockpile as a deterrent to war. The DoD’s “About Us” statement says it best– “With our military tracing its roots back to pre-Revolutionary times, the department has grown and evolved with our nation. Our mission is to provide the military forces needed to deter war and ensure our nation's security” (U.S. Department, n.d.). Many powerful American weapons lie dormant for decades, preventing conflict by merely existing. While some perceive stockpiling as an expensive waste, weapons must change with the times to meet the standard of adversaries. According to the 2022 National Defense Strategy, the DoD’s 4 top-level priorities include defending against China, deterring attacks against the US and allies, preparing to prevail in the case of conflict, and “Building a resilient joint force and defense ecosystem” (Lopez, Oct. 2022). Secretary of Defense Lloyd J. Austin III stated, “We're seamlessly integrating our deterrence efforts to make a basic truth crystal clear to any potential foe ... that the cost of aggression against the United States or our allies and partners far outweigh any conceivable gains” (Lopez, Oct. 2022). The DoD depends on contractors to meet its priorities, and

contractors market their work consistently with the DoD's vision. Raytheon's "About Us" statement, which is similar to the other primes, reads "At Raytheon, the foundation of everything we do is rooted in our values and a higher calling – to help our nation and allies defend freedoms and deter aggression" (RTX, n.d.). The patriotism approach does not silence all critics of the defense budget, but mutually assured destruction has strong credentials as a defense strategy. Political power and impact on the scientific community at large account for the rest of the military-industrial complex's growth in the face of controversy.

While some engineers carry moral guilt related to defense work, those who take pride in their role supporting the MIC often cite concerns about foreign aggression. Reddit user "rhombomere" suggests that conflict is inevitable. They stated, "if there was a conflict, I wanted to make sure that my country's troops won and... do my utmost to make the best items that I can, and make sure that as many of them come home as possible" ([rhombomere], 2013). The DoD speaks often about Russia and China, but engineers know that U.S. troops around the world depend on advanced weapons for their safety. On a separate Reddit thread, "Quantitas" wrote, "In a perfect society we wouldn't need [weapons]. Regrettably we don't live in a perfect society and if you don't deter threats to your cause, you'll lose" ([Quantitas], 2022). Both "rhombomere" and "Quantitas" understand that foreign policy strategies reflect the needs of the present. In a world plagued by conflict, the United States weapons arsenal is a vital survival tool.

More than Just Missiles

Prime defense contractors provide engineers with competitive salaries and opportunities to work on revolutionary technology across the aerospace field, enhancing their ability to garner support. The same companies that build missiles and intelligence instruments put satellites in

space and commercial airplanes in the sky. On a Reddit forum regarding how engineers rationalize the fact that their products might harm civilians one day, user “pomjuice” stated, “I know a lot of science, technology and innovation has come out of the MIC. GPS technology was made popular by the Navy. The Apollo program was based on the rocket program” ([pomjuice], 2013). American defense contractors also built several parts of the International Space Station, which is one of the greatest examples of global collaboration to benefit humanity. Engineers have every right to work on such projects at companies with a greater mission, especially in a competitive job market. On Reddit thread r/EngineeringStudents, “Giz_moe” said, “I work in defense and space. I work on projects that work towards putting more advanced satellites in space to better detect hostilities. Obviously this isn’t only defensive in nature, this better information can enable more aggressive targeting but overall I believe it’s necessary for US safety and security” (Giz-moe, 2022). Though supporting companies who develop weapons as an employee perpetuates their ability to cause harm, the patriotism argument in tandem with the fact that defense contractors stimulate innovation makes it easier to overlook shortcomings.

Non-defensive products contribute to industry’s budget, which justifies some of the funding that defense contractors receive. Lockheed Martin’s 2023 fourth quarter report summarizes their greatest innovations of the year, including OSIRIS-REx, contributions to Artemis I, and the Lucy Spacecraft, which discovered 2 asteroids on its first successful flight (Lockheed, 2024). NASA sponsors contracts in addition to the DoD for work related to its missions. Northrop Grumman was the mastermind behind the James Webb Space Telescope, which recently produced the deepest and sharpest infrared photograph of the distant universe in addition to now-famous images of the Southern Ring Nebula and the Pillars of Creation (Beyoghlow, n.d.). The company would not have the resources to make such contributions

without its thriving defense business. Boeing is perhaps better known for its commercial aviation work than its defense work, and they recently invested in research and development to support the civil aviation industry's goal of reaching net-zero carbon emissions. NASA selected Boeing for its Sustainable Flight Demonstrator Award due to work on a Transonic Truss-Braced Wing demonstrator airplane that would reduce fuel consumption by up to 30% compared to similar-sized aircraft (PRNewswire, 2023). Prime contractors feature non-defensive work alongside defense work on their websites to remind critics of their positive contributions to society.

As massive employers, the prime contractors' and the DoD's significant contributions to the US economy also help overshadow moral concerns about weapons development. The Government Accountability Office tracks jobs created by the DoD, and there are currently 2.1 million service members supporting the department alongside 770,000 civilian employees (U.S. Government, 2023). Millions more support the DoD's work from a distance. Contractors use their economic contributions, both in terms of jobs created and GDP, as a marketing strategy. Lockheed Martin produces an interactive map showing how many jobs the F-35 program generates in each state on a website with the headline "The Most Economically Significant Defense Program in History, Contributing Approximately \$72 Billion Annually". The F-35 creates 298,000 jobs in advanced manufacturing and sources parts from 1650 suppliers, 1000 of which are small businesses (Lockheed, n.d.). Northrop Grumman's "Who We Are" statement cites the size of the company: "Our 100,000 employees are Defining Possible every day using science, technology and engineering to create and deliver advanced systems, products and services" (Northrop, n.d.). The primes take pride in their people, and the size of the defense industry solidifies its power over the federal government.

Military-Industrial Complex: An Well-Oiled Machine

The defense industry's unwavering support from the government limits critics from inspiring real change. While investing in the MIC is a cornerstone of the Republican agenda, even left-leaning politicians support aggressive defense bills that promote industry growth. The Blue Dog Coalition, a fiscally conservative and moderate voting bloc of Democrats in the House of Representatives, championed the passage of the 2023 National Defense Authorization Act (NDAA), which increased the defense budget beyond President Biden's request (Blue Dog Coalition, 2022). House Republicans summarize the contents of the NDAA in a public document, highlighting that it "Reverses President Biden's reckless cuts to our national security, restoring cuts to procurement, missile defense, and military construction" (House, n.d.). The 2023 NDAA authorized \$858 billion for national defense programs. Citizens who disagree with the NDAA have few options beyond voting for policymakers who oppose militarization. However, between lobbying and campaign contributions, the prime contractors have the House Armed Services Committee in their pocket. A pillar of the iron triangle is, after all, its tendency to exclude outsiders.

The defense industry's significant investment into lobbying successfully counters efforts by advocacies to sway politicians' stances on the defense budget. In 2022, the industry spent \$128,698,496 for 848 lobbyists, and that sum rose by \$10 million in 2023 (Senate, 2024). No matter how much capital Win Without War and other advocacies raise in a year, they lack the direct line of communication with politicians that lobbyists provide. OpenSecrets, a nonprofit research group that publishes raw data on money in politics, refers to the defense lobbying presence as "formidable" in their overview of the industry, noting that main lobbying goals

include securing contracts and influencing the budget (Auble, 2023). Campaign contributions make up a smaller portion of political expenditures by contractors, but Lockheed Martin, Northrop Grumman, General Atomics, and L3Harris Technologies all donated over \$1 million to 2024 candidates (Federal Election, 2024). Regardless of the size of America's stockpile, defense contractors will always provide services that the military needs. It would take countless organizations to overpower the collective efforts of defense contractors to influence the government.

MIC critics point out waste and poor spending transparency as flaws related to the defense budget, but the DoD's almost-daily updates on the status of contracts are an effort to increase trust. Such updates shed light on the purpose of the budget while reminding Americans that Adams' Iron Triangle persists. In June 2023, the Missile Defense Agency gave Raytheon \$621,400,000 to maintain the equipment, facilities, and personnel required to transport, test, upgrade, and repair existing Exo-atmospheric Kill Vehicles (U.S. Department, 2023). On February 2, 2024, the Navy modified an existing contract with Lockheed Martin, providing \$150,560,000 to reconfigure 6 MH-60R aircraft for the government of Norway (U.S. Department, Feb. 2, 2024). On February 13, 2024, the Navy gave L3Harris Technologies \$7,897,444 to enhance communication networks (U.S. Department, Feb. 13, 2024). These 3 transactions are a random selection of examples of the massive flow of money between the DoD and private companies each day. The updates are a clear attempt to justify the budget, should critics choose to read the rather bland financial reportings.

Conclusion

Between harnessing patriotic values, spearheading innovations that push the boundaries of possible, and reinforcing a history of political and financial support from the federal government, the military-industrial complex is a fortress. The DoD and its contractors tug at America's heart strings with people-centric marketing, and space products distract civilians from the real money-makers. Though the DoD pursues weapons development as an advantage, numerous Americans feel that nuclear stockpiling has gone too far. Harsh criticism of government policies should raise questions about whether America's Democracy truly represents the collective input of the people. Defense is one of many industries with power over politicians, and while OpenSecrets works to unveil the effect of such power, advocacies lack sufficient support to propel change. The military-industrial complex manages criticism by growing in scale and influence. Only a massive, government-wide shift to the left or a global "end war" campaign could change America's defense strategy and limit future budget growth. One must only hope that engineers are following their codes of ethics, soldiers are following their civilian harm mitigation directives, and DoD leaders and politicians are making decisions with the safety and security of the American people and citizens of the world in mind. There is no right answer, yet as the world exists today, defense is not inherently wrong. As Artificial Intelligence brings philosophical debate to the forefront of technology development, society will be forced to decide whether "not inherently wrong" is a good enough reason to push innovations forward.

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