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Adapting to the Future: Invesco Examines the Evolution and Modernization of Defense Companies

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As with all investments, your capital is at risk

Adapting to the Future: Invesco Examines the Evolution & Modernization of Defense Companies

October 2023

Brandon Knott
ETF Thematic & Specialty Strategist

Navigating the Defense industry

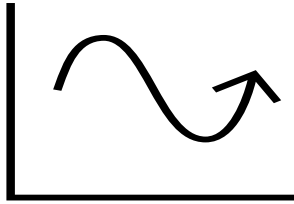
Manufacturing

- Aircraft, Helicopters
- Ships/naval vessels
- Armored vehicles/tanks
- Missiles/missile defense
- Space systems/satellites/rockets
- Drones/remotely piloted vehicles

Services

- Secure communications
- Command and control
- Intelligence gathering
- Reconnaissance/surveillance
- Data and imagery analysis
- Border security
- Cyber security

How does the Defense industry behave?



In addition to the investment or replacement cycle associated with capital goods, the rise and fall of the defense sector also must respond to outside factors:

- Aggressors
- New technologies
- Types of warfare/threats

US Military Actions

- 1914 – 1918: WWI
- 1939 – 1945: WWII
- 1950 – 1953: Korean War
- 1947 – 1991: Cold War
- 1959 – 1975: Vietnam
- 1991: Gulf War
- 2001 – 2021: War on Terror
- Present: Russia-Ukraine War/Various hotspots

How is the Defense industry unique?

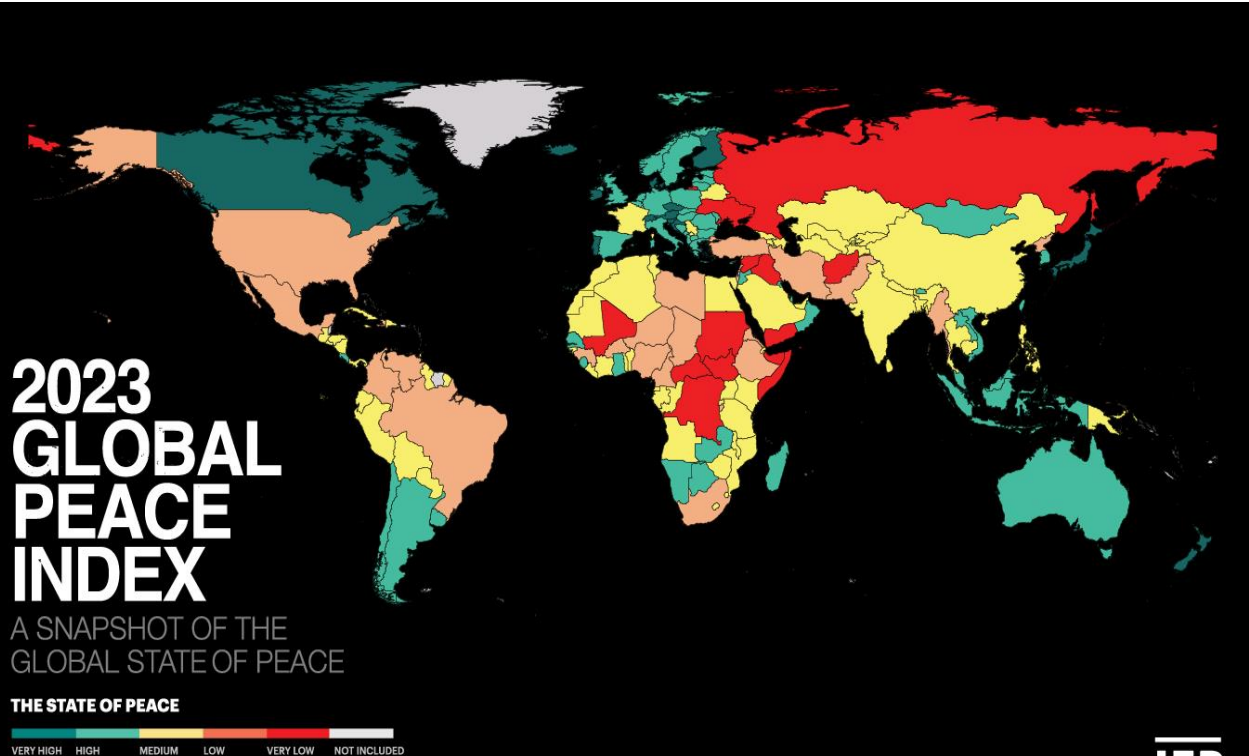
Many companies in the defense industry are exposed to the US Department of Defense (DoD) budget :

- **Multi-year contracts:** The DoD grants, large, multi-year contracts
- **Reliability:** Unlike the commercial space, the DoD's ability to pay may be less reliant on the macro economic backdrop
- **Countercyclicality:** the defense sector may respond differently to geopolitical and/or macro economic events due to the potential reduced economic sensitivity of DoD contracts
- **Inflation mitigation:** many DoD contracts include escalation clauses that allow firms to pass along these costs
- **Diversified revenue:** many are able to diversify not only across commercial and government, but sometimes even across agencies (Homeland Security, DoD, etc)



Diversification does not guarantee a profit or eliminate the risk of loss.

Current and evolving threats to the US



79 countries

Witnessed increased levels of conflict including Ukraine, Ethiopia, Myanmar, Israel and South Africa.¹

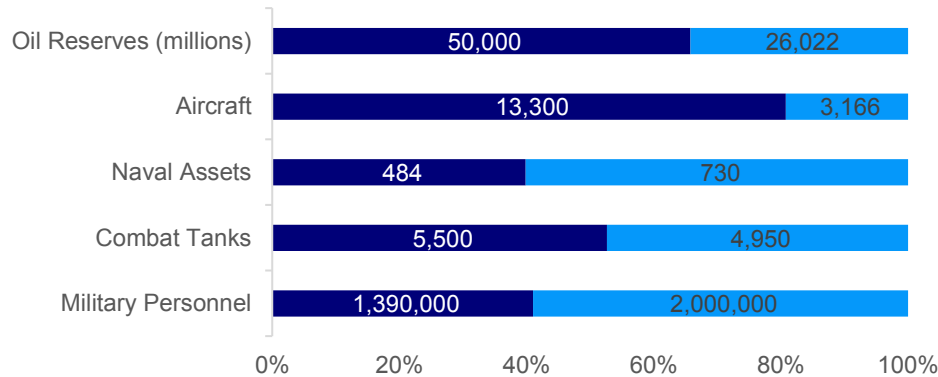
Source: ¹Institute for Economics & Peace (IEP); Global Peace Index 2023; as of June 28, 2023

Illustration: Institute for Economics & Peace. Global Peace Index 2023: Measuring Peace in a Complex World, Sydney, June 2023.

Current and evolving threats to the US

China

US vs China Military Power¹



	Military Personnel	Combat Tanks	Naval Assets	Aircraft	Oil Reserves (millions)
■ US	1,390,000	5,500	484	13,300	50,000
■ China	2,000,000	4,950	730	3,166	26,022

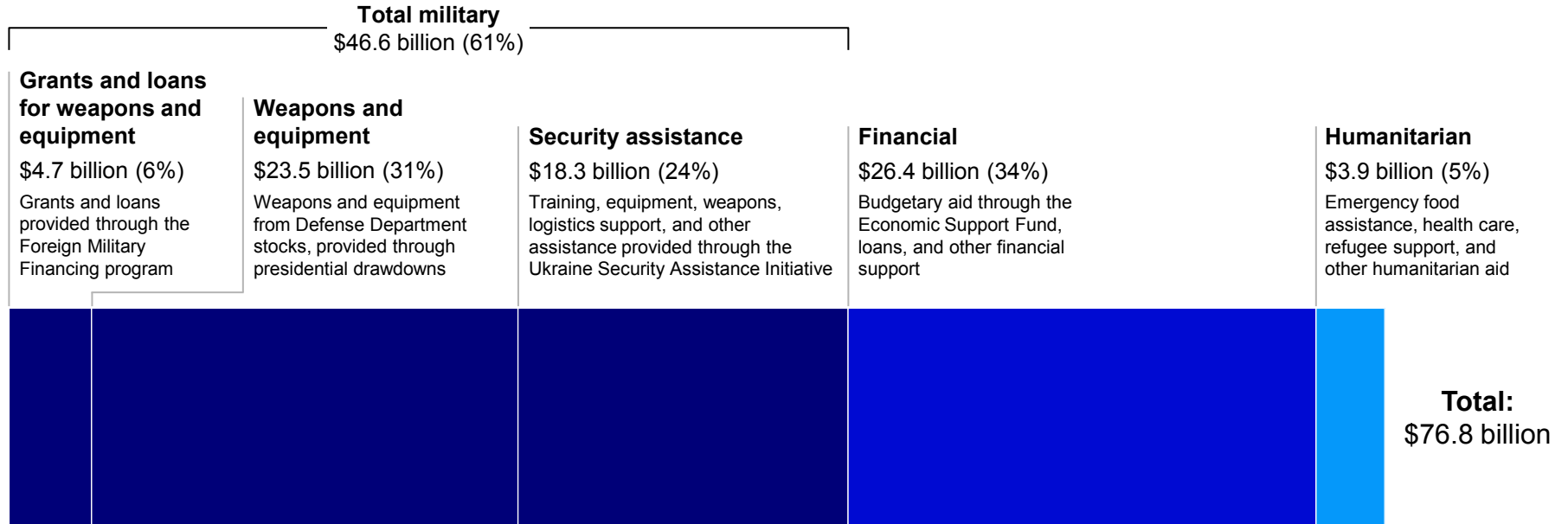
- According to Pew Research Center, 50% of Americans believe China poses the greatest threat to the U.S.²
- While China has greater numbers in several categories this does not take into account other less quantifiable factors such as training, quality and/or how advanced a particular unit may be.
- China continues to invest heavily in its defensive capabilities to close gaps wherever they may lie.
- A Chinese blockade of Taiwan would cause a drop in global economic output of \$2.7 trillion³

¹Source: Global Fire Power, July 12, 2023

²Pew Research: Survey of U.S. adults conducted May 30 – June 4, 2023

³Institute of Economics & Peace (IEP): 17th edition of the Global Peace Index, as of June 28, 2023

Current and evolving threats to the US Ukraine



Source: Antezza et al., Ukraine Support Tracker, Kiel Institute for World Economy; January 24, 2022 to July 31, 2023

Note: Aid has primarily been provided through appropriations bills. This chart only covers aid to Ukraine and so does not include all U.S. spending related to the war.



Source: U.S. Department of State: US Security Cooperation with Ukraine Fact Sheet; as of September 8, 2023

What drives growth in the defense industry?

Source:

¹ DoD Budget Briefing FY 2024, included funding for DoD and nuclear military activities at agencies such as Dept of Energy

² SIPRI press release, calendar year 2022 data

³ DoD Budget FY2023

Inside the numbers...

\$7.0 Trillion

Amount spent by the US on defense in the last decade¹

\$2.24 Trillion

Amount spent globally on defense in 2022²

~4% of US GDP

Amount spent globally on defense activities³

Defense Industry Growth Drivers

Driver 1: An unstable global situation

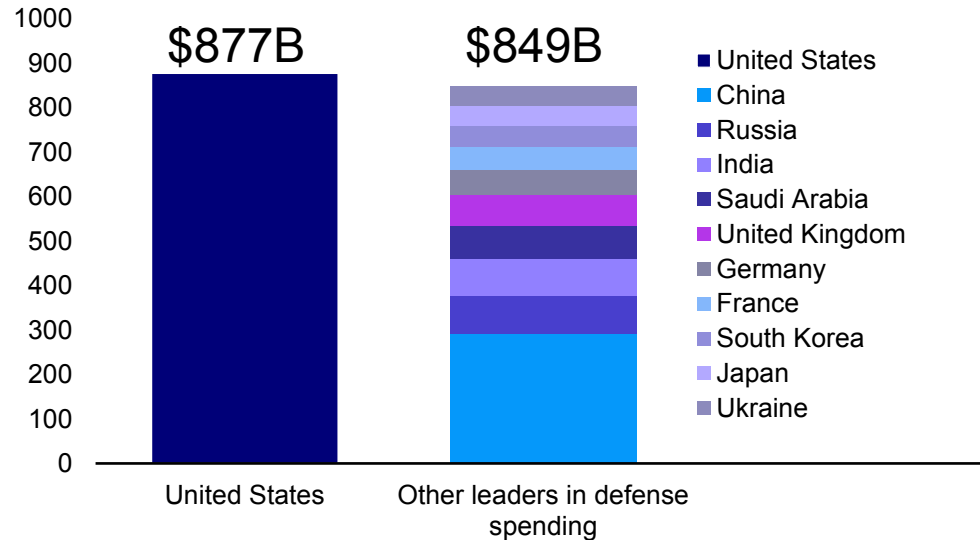
Defense spending may help mitigate global risk and change. Below are some of the current global political situations monitored by U.S. defense authorities:

- Russia's Invasion of Ukraine
- China naval incursions in the Pacific
- Tension between China & Taiwan
- North Korea
- Iran / Nuclear tension
- Hypersonic missile developments
- Turkey / President Erdogan
- Ongoing tension in the Middle East
- Afghanistan
- Syrian civil war
- Instability in Iraq
- Republic of Niger civil war
- North Africa / Libya
- Yemen-Saudi Arabia
- Disintegration of the EU model
- Central American drug / gang wars

Defense Industry Growth Drivers

Driver 2: The Department of Defense (DoD) Budget

US vs. subsequent top 10 defense spenders in 2022¹



Source: ¹Statista: countries with the highest military spending worldwide in 2022; as of August 29, 2023

- The U.S. defense budget was \$27.9 billion greater than the next 10 largest countries budgets combined. ¹
- The U.S. defense budget is ~3 times that of China, the second largest defense budget. ¹
- A sizable and increasing defense budget has generally received bipartisan support due to the importance of maintaining existing equipment and personnel, while also keeping pace with inflation.

Defense Industry Growth Drivers

Driver 3: International Defense Sales

US Defense contractors are less reliant on the Pentagon's budget than ever before. Increased sales to the global community represent a significant part of revenues.

- The US budget is nearly 40% of the total spent worldwide on defense.¹
- Combined, in 2022 the world spent \$2.24 trillion on defense.¹
- Global arms sales by the 100 largest companies (ex-China) was \$592 billion in 2021.¹
- US foreign military sales rose 49% to \$51.9 billion, direct commercial sales rose a similar amount to \$153.7 billion.²
- Lockheed Martin, Boeing, Northrop Grumman, Raytheon, and General Dynamics revenues represent 38% of the global top 50 defense suppliers.¹

Source: ¹Stockholm International Peace Research Institute (SIPRI) – April 24, 2023

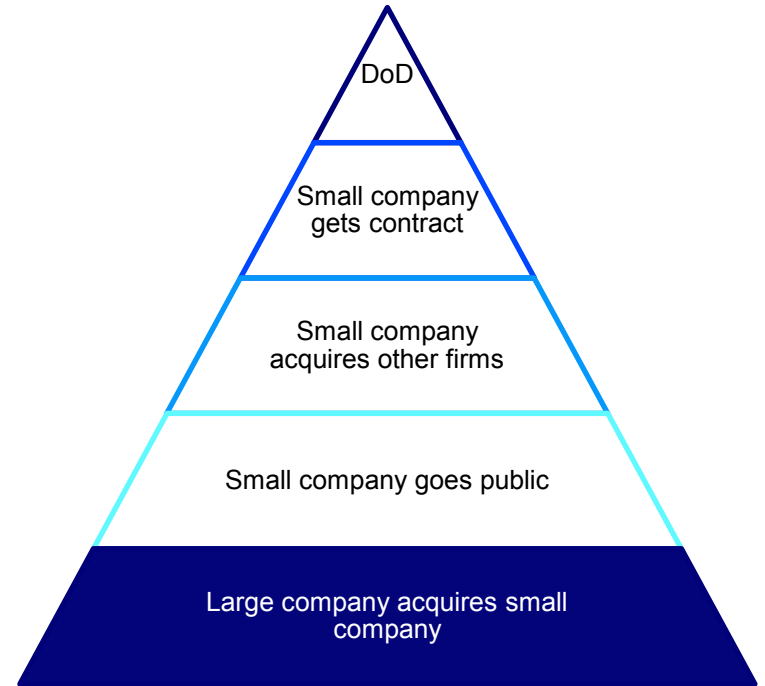
²U.S. Foreign Military Sales Bounce Back; National Defense – April 13, 2023

This is not to be construed as an offer to buy or sell any company mentioned and should not be relied upon as the sole fact in an investment-making decision.

Defense Industry Growth Drivers

Driver 4: Acquisitions

- On average, the defense industry sees several hundred deals annually
 - Mostly small, <\$100 million
 - Mostly private
- The acquisitions provide...
 - Exposure to long-term contracts
 - Key personnel
 - Access to classified programs and personnel
 - Technology & capabilities



Source: The Spade Indexes; as of August 31, 2023

Defense Industry Growth Drivers

Driver 5: Technology

- DoD's primary role is to maintain and enhance capabilities that allow our military to have an advantage over an enemy or possible enemy.
- Technology evolves quickly, changing the landscape and need for enhancing or replacing obsolete technologies.

DoD's changing interest over time:

- 1916 – 1918 WWI: Aircraft, tanks, machine guns
- 1939 – 1945 WWII: Introduction of the jet, missiles
- 1946 – 1960+: Nuclear weapons age
- 1957 – today: satellite systems
- 1980s: stealth technology
- 2000s: network centric warfare
- 2010s: drones, autonomous vehicles & big data
- 2020s: hypersonic missiles and AI

Defense Industry Growth Drivers

Driver 6: Diversification

Diversification can take many shapes, but most employ/attempt to employ some diversification strategy.

- Diversify across agencies: the larger defense firms tend to work on multiple contracts for different agencies and programs.
- Employ skillsets and equipment toward contracts with non-military agencies such as NASA, Department of Energy, HHS, etc.
- Maintain a number of commercial and non-defense related enterprises

Diversification does not guarantee a profit or eliminate the risk of loss.



Key technologies that have the DoD's attention



\$10.27B

In 2022 the top ten defense companies in the US spent \$10.27 billion on Research & Development (R&D).¹

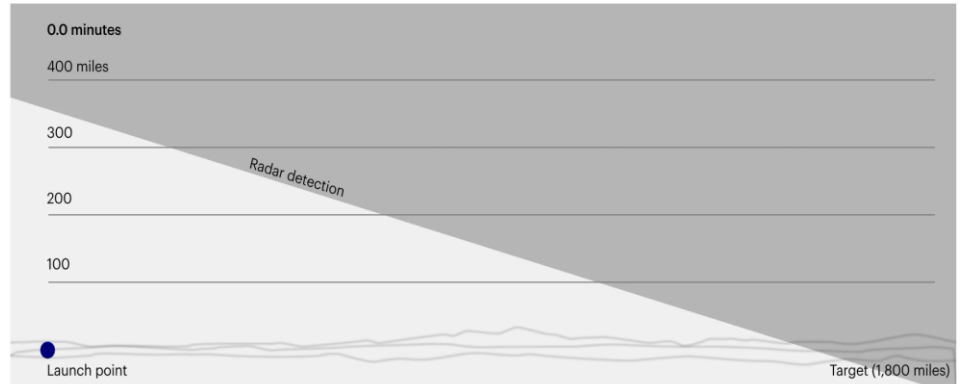
Key Defense Technologies

Hypersonic Missiles

Hypersonic Missiles

- Can travel 20x the speed of sound or ~15,000 mph
- Able to evade most missile defense systems and can be launched from great distances
- Carry conventional explosives or nuclear warheads
- Defense department has allocated \$5 billion to build out these capabilities
- Fly at low altitudes and can maneuver in flight

Hypersonic vs. Ballistic vs. Non-hypersonic cruise missiles; approximate speed and trajectory



Key Defense Technologies

Artificial Intelligence (AI)

Artificial Intelligence (AI)

- Has been a part of the military's strategy for decades
- Amount of data needed to process has increased significantly over the years
- Detection: AI supported systems to collect and analyze surveillance data. Smart sensors to track and detect objects or personnel.
- Planning: use data and machine-learning algorithms to better anticipate resourcing requirements and associate costs for missions and training exercise.
- Field operations: real time information and quick assessments to improve mission outcomes, protecting people, assets and information
- Support functions: expedite procurements processes and manage vendor contracts. Provide intelligent budgeting solutions.



Key Defense Technologies

Uncrewed aircraft systems (UAS)

Uncrewed Aircraft Systems (UAS)

- Also commonly referred to as drones
- 20 mentions in the DoD's National Defense Strategy
 - Considered a top threat to the US Military and Homeland Security, but also an important technology for the country's defense
 - Similar to hypersonics, UAS create challenges for traditional air and missile defense systems
 - Inexpensive, flexible and allowing for plausibly deniable way to carry out tactical level attacks
- US Military usage
 - Intelligence gathering
 - Target acquisition
 - Force protection
 - Search and rescue
- Civilian drones are being retrofitted for low-cost military use



Thank you

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