

SPADE Defense Index Remains Near Historic Highs

- Military Expenditures Around the Globe Increasing Across All Regions
- Massive A&D Backlogs Grow
- Conversion of Backlog to the Bottom Line
- Continuation of Buybacks Bolster Stocks
- Is a New “Axis” to Counter NATO Allies Developing
- The NATO Summit in Washington DC
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- What’s On Our Wall of Worry

SPADE Defense Index Statistics

6/28/24 Close 12,029.02
12/31/23 Close 10,804.91

All-time Intraday High:
21 May 2024 12,396.96

All-time Closing High:
21 May 2024 12,380.72

Price Return	SPADE Defense	S&P 500
2Q2024	1.04%	3.92%
YTD	11.33%	14.48%

COMMENTARY

Military Expenditures Around the Globe Increasing Across All Regions

Sometimes the data speaks for itself. Here are facts from the latest Stockholm International Peace Research Institute (SIPRI) report for 2023:

- World military expenditures rose for the 9th consecutive year.
- Spending hit an all-time high of \$2.443 Trillion!
- For the first time since 2009, spending rose in all five geographical regions.
- Russia’s spending increased by 24% to an estimated \$109 billion, up 57% since 2014—16% of its total government spending and 5.9% of its GDP.
- Ukraine spending surged 51% to \$64.8 billion, 58% of government spending. It also received about \$35 billion in military aid during the year, including \$25.4 billion from the US.
- In 2023, most European NATO members increased their military expenditures; its combined share of NATO was the highest in a decade.
- 11 of 31 NATO members spent at least 2% of GDP and a target of directing 20% or more of military spending to equipment was met by 28 NATO members, up from 7 in 2014.

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SPADE Defense Index June 2024 Rebalance

In: C3.ai (NYSE: AI), LOAR Holdings (NYSE: LOAR)

Out: None

Corporate Actions Affecting the Index During the Quarter

- Kaman was acquired by private equity during the quarter.
- Jacobs is planning to spin its defense business later in 2024.
- Boeing has put in a bid for Spirit AeroSystems, anticipated close in 2025.

Dividend

Invesco’s Aerospace & Defense ETF issued a dividend of \$0.13929 per share on 24 June 2024. Over the past 12 months, \$0.62453 per share was returned.

Licensed Products

Exchange Traded Fund (ETF)

The SPADE Defense Index has been licensed to Invesco and serves as the underlying index for the Invesco Aerospace & Defense ETF (NYSE Arca: PPA).

A Morningstar 4-Star Fund

★★★★

Options Trading

Options on the Invesco Aerospace and Defense ETF (ticker: PPA) are available.

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- China allocated \$296 billion in 2023, up 6%, the 29th consecutive year-on-year rise.
- In response to China, Japan and Taiwan each increased their military expenditures by 11%.
- Middle East spending rose by 9% to \$200 billion, the highest annual growth rate in the past decade.
- Israel's spending, the second largest after Saudi Arabia, grew 24% to \$27.5 billion, driven by its response in Gaza to the attacks on its southern border by Hamas in October 2023.
- Poland's military spending rose 75% to \$31.6 billion in 2023—in response to protect its future Russia aggression.

Massive A&D Backlogs Grow

The major defense prime contracts are scheduled to report 2Q24 earnings later this month—LMT: 7/23, GD: 7/24, RTX: 7/25, NOC: 7/25, BA: 7/31. It'll be interesting to see how backlog at these firms has changed from the historic high levels posted in 1Q24. As a reminder, for the first quarter of 2024, RTX posted \$202 billion in backlog and Lockheed Martin, \$159 billion. Even Boeing, despite its recent issues with its commercial aircraft and cost overruns on some military programs, maintains a backlog of \$529 billion—nearly seven times the revenue it posted in 2023.

Conversion of Backlog to the Bottom Line

Ramping up the production volume of an older system is more profitable than the margins for developing new technologies and systems. Defense firms should see a direct translation from reducing backlog to increased bottom-line profits.

“The math is simple,” according to Mike Stone, a reporter at Reuters. “For example, to meet demand for missile defenses, production of Patriot interceptors for the U.S. Army—a projectile fired at an incoming missile with the aim of knocking it down—will rise from 550 to 650 rockets per year. At around \$4 million each, that's a potential \$400 million annual sales boost on one weapons system alone.”

Continuation of Buybacks Bolster Stocks

Several large defense firms—General Dynamics, Lockheed Martin, L3 Harris, Northrop Grumman, and Raytheon—bought back \$2.6 billion worth of shares in 1Q2024; with Lockheed and Northrop each spending \$1 billion. This despite a recent warning from US Navy top officials stating that defense firms should prioritize supply chain and workforce issues over shareholder returns.

Around the Globe

From an investment perspective, a conclusion or resolution to the current hostilities taking place in Ukraine and Israel would likely lead to some investor pullback as a short-term reaction, defense firms should likely continue to see strong support over the coming years.

Is a New “Axis” to Counter NATO Allies Developing?

- The Shanghai Cooperation Organization, led by China and Russia, has been discussing deeper coordination on military, economic, and political matters.
- India's Prime Minister Narendra Modi and Russian president Vladimir Putin recently met and Modi referred to Putin as “my dear friend.” Deepening ties between the two nations are being reported.
- China recently held a joint military “anti-terrorist” training operation with Belarus, a close ally of Russia and Putin.
- NATO called China a “decisive enabler” of Russia's war in Ukraine; unusual in that it explicitly identified Beijing as a threat to its interests. China subsequently warned the US and its allies not to “provoke confrontation.”

Middle East

A cessation of hostilities between Israel and Hamas in the coming months is likely; however, spending on security in the region should remain elevated for some time.

- The election of a more moderate president in Iran provides some hope for a de-escalation, however that has to be proven first.
- Houthi Attacks—In recent weeks, Iranian-supported Houthi militants have been sending exploding drone boats with explosives into the Red Sea to attack merchant ships.
- Meanwhile, the threat posed by Hezbollah—an Iranian-backed militant and political organization operating out of Lebanon and considered a terrorist group by the U.S. and the U.K.—is one of the most heavily armed nonstate groups in the world, with an estimated capability that is 10x that of the militant group Hamas. An all-out war between Hezbollah and Israel would be devastating to both sides and to Lebanon. And while current actions are carefully calculated to avoid a major escalation, with near daily exchanges of fire along the border, it only takes a single stray rocket causing mass casualties to see things get out of control. This would provide the fuel for another leg higher for defense stocks.

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The NATO Summit in Washington DC and Europe

- 75th anniversary of the defense pact.
- NATO guaranteed a path for Ukraine's future into NATO.
- Biden/NATO allies pledge more air defense systems for Ukraine and a boost to weapons output to counter the Russian threat.
- Netherlands is sending F-16 fighter jets to Ukraine.
- Multiple conversations took place regarding how NATO could temper actions taken by a second Trump Administration. In February Trump stated that he would not provide military protection to any member state that had not met its financial obligations and would even encourage adversaries to "do whatever the hell they want to that nation."

PPA Attribution

The truth is it is hard for any index to beat the S&P 500 when the six firms (NVDA, AAPL, GOOG, MSFT, META, AMZN) that represent nearly 1/3 of the index (32.13% as I type) surge higher. YTD Apple is up 19.74%, Nvidia is up 160.97%, Alphabet is up 32.53%, Microsoft is up 20.61%, META is up 40.94%, and Amazon is up 28.00%. Still the S&P 500 is up only 17.82% and the SPADE Defense Index is up 13.31%. With a market pullback or the possibility that inflows to the large tech firms run out of gas likely before the end of the year, we believe that defense stocks should close that gap.

What's On Our Wall of Worry

In any large industry, especially ones involved with development advanced technology systems, there are always issues to watch. Here are a few that are on our radar, although we have not yet seen them meaningfully impact the overall business.

- Sporadic supply chain disruptions and issues related to hiring additional staff continue to impact firms' ability to increase production capacity for the weapons systems and equipment required to supply Ukraine's war effort, support Israel and restock national assets.
- According to the Government Accountability Office (GAO), Lockheed F-35 stealth fighter won't be able to fly its most advanced missions until 2025 because of unstable software impacting the TR-3 upgrade to the plane's systems. These delays and supplier challenges could impact the number of jets delivered later this year. Bloomberg reported that the Pentagon is withholding \$7M per plane, totaling \$147 million through January, and the firm has forfeited a \$60M bonus.

- Boeing has lost \$32 billion since 2019. As they address quality issues, they have reduced how many planes it delivers to customers—a level below where it turns a profit. Debt levels have grown from \$13B at the end of 2018 to \$48B today. In a recent report, Moody's stated Boeing has \$4.3B of debt coming due in 2025 and \$8 billion due in 2026 meaning the firm will likely have to issue new debt to fund those shortfalls. Benefitting Boeing is the fact that, even if customers decided to shift to Airbus, there is a multi-year long wait.
- European Union officials have called for a new defense industrial strategy focusing on locally made armaments instead of relying on US sales.

Curious about the historical relationship between stock market returns and who controls the White House and Congress?

SPADE Indexes has released an update to its report with the raw data: <https://spadeindex.com/Files/election.pdf>

20 Years Ago...

In 2004, after reading an article about a new investment product called "an ETF" (the entire market at the time was just \$200B vs \$8T today), I phoned the author to ask a question about something that just didn't make sense to me. For some reason, the call rang in the American Stock Exchange conference room. Instead of talking with the journalist, the call was forwarded to Bob Tull, at the time the director for new ETF business. After chatting for more than half an hour about ETFs and my background, SPADE Indexes was founded with the purpose of creating a defense index for a small ETF provider called Powershares (eventually acquired by Invesco), led by Bruce Bond.

Now, 20 years later, the SPADE Defense Index is the de facto index benchmark for investing in defense sector and a huge success...with \$3.3 billion in assets tracking it. Of course, it hasn't hurt that over that time the index gained 736% and outperformed the US stock market in 13 of 20 years—five times by more than 10%!

So, to everyone who has been involved with SPADE over the years and to all of the investors that have trusted our methodology, thank you!

To Bruce Bond (the founder of Powershares) and his team at the time, thank you for having faith in an entrepreneurial indexer and launching the first ETF designed to track the sector.

2Q24 Leaders

1	TTM Technologies	24.15%
2	AAR Corp.	21.43%
3	AeroVironment	18.84%
4	LOAR Holdings	18.69%
5	Heico	17.07%
6	Amphenol	16.82%
7	Leonardo DRS	15.48%
8	CACI International	13.54%
9	Howmet	13.44%
10	Ducommun	13.18%

2Q24 Laggards

1	Viasat	[29.75%]
2	Elbit Systems	[15.98%]
3	Huntington Ingalls	[15.49%]
4	Hexcel	[14.28%]
5	Oshkosh Truck	[13.24%]
6	Keysight Tech.	[12.55%]
7	Textron	[10.50%]
8	CAE	[9.98%]
9	SAIC	[9.85%]
10	Teledyne Tech.	[9.63%]

ETF Statistics (NYSE Arca: PPA)
Invesco Aerospace & Defense

Exchange / Ticker	NYSE / PPA
Assets (6/30/2024)	\$3.3 B
Closing Price (6/30/2024)	\$102.72
Dividend Yield*	1.11%
2Q2024 Volume**	8,898,100
Turnover*	19
Morningstar Rating*	**** (4-Star)
* Morningstar ** Yahoo Finance - 6/30/2024	

Capture Ratio	3-Yr	5-Yr	10-Yr
Upside	82	83	103
Downside	53	77	77

2024 YTD Results

1	Palantir	47.52%	28	Parker Hannifan	9.79%
2	Aerovironment	44.53%	29	Jacobs Engineering	7.63%
3	Howmet	43.44%	30	Textron	6.76%
4	Amphenol	35.94%	31	L3 Harris	6.63%
5	Leidos	34.77%	32	OSI Systems	6.56%
6	CACI	32.81%	33	Spirit Aerosystems	3.43%
7	Parsons	30.46%	34	V2X	3.27%
8	Eaton	30.20%	35	Lockheed Martin	3.06%
9	Woodward	28.10%	36	Cadre Holdings	2.32%
10	Leonardo DRS	27.30%	37	Honeywell	1.83%
11	Barnes Corporation	26.91%	38	C3.ai	0.87%
12	Transdigm	26.30%	39	Oshkosh Truck	[0.19%]
13	Heico	25.01%	40	Kratos Defense	[1.38%]
14	General Electric	24.56%	41	Huntington Ingalls	[5.13%]
15	BWX Technologies	23.81%	42	SAIC	[5.45%]
16	TTM Technologies	22.90%	43	Northrop Grumman	[6.88%]
17	ATI	21.95%	44	Triumph Group	[7.06%]
18	Curtiss Wright	21.63%	45	Teledyne Tech.	[13.07%]
19	Booz Allen	20.32%	46	CAE	[13.94%]
20	Raytheon Tech.	19.31%	47	Keysight Tech.	[14.04%]
21	LOAR Holdings	18.69%	48	Hexcel	[15.32%]
22	AAR Corp	16.51%	49	Elbit Systems	[17.17%]
23	KBR	15.76%	50	Mercury Systems	[26.20%]
24	Moog	15.55%	51	Boeing	[30.17%]
25	AXON International	13.90%	52	Iridium	[35.33%]
26	General Dynamics	11.73%	53	Viasat	[54.53%]
27	Ducommun	11.53%			

Portfolio Price/Earnings	23.52	Beta (3-yr)	0.78
Portfolio Price / Book	3.92	Alpha (3-yr)	6.79
Portfolio Price / Sales	1.92	R-squared (3-yr)	50.15
Portfolio Price / Cash Flow	16.99	STD Deviation	18.35
Long-Term Earnings	13.88%	Sales Growth	5.15%
Historical Earnings	2.91%	Cash Flow Growth	.89%
		Book Value Growth	7.72%

By The Numbers

\$140.9 Billion - The Pentagon confirmed its commitment to continue development of Northrop Grumman's LGM-35A Sentinel ICBM but told the USAF to revise the program's structure due to rising costs.

\$21 Billion - The Senate Appropriations Committee agreed to a spending increase of 3.4% for defense, higher than the 1% agreed to by President Biden and Kevin McCarthy last year.

\$10.6 Billion - GlobalData forecast for the artillery systems market for 2024. The market consists of self-propelled artillery systems, multiple rocket launch systems, towed artillery system, naval gun, and close-in weapons systems.

\$7.5 Billion - Boeing from the USAF for kits that can convert unguided bombs into precision-guided munitions, through 2030.

\$2 Billion - Honeywell is acquiring CAES Systems to expand its defense technology offerings.

\$2 Billion - The US is providing Poland a Foreign Military Financing loan to purchase US-made weapons including early warning radar systems.

\$2 Billion - The US State Department approved a deal for AIM-120C-8 AMRAAM missiles to Denmark (84 at \$215.5M) and Norway (300 at \$1.94B) to replace the 120B stock.

\$2 Billion - RTX from the US Navy for SPY-6 radar systems

contract mods.

\$2 Billion - El Al Airlines to Boeing for 30-737 Max aircraft.

\$1.1 Billion - General Dynamics Bath Iron Works received a five-year contract from the NAVY for planning yard support services for the Arleigh Burke class destroyers.

\$1.1 Billion - General Electric received from the US Army a contract for T700 aircraft engines to power the UH-60 Black Hawk and Apache helicopters.

\$998 Million - L3Harris received a US Navy contract to produce Multifunction Information Distributed System Joint Tactical Radio Systems terminals.

\$738 Million - Leidos from the USAF for IT and telecom services.

\$700 Million - RTX from NATO to boost production of Stinger missiles.

\$677 Million - RTX from the US Navy to produce AN/SPY-6(V) radars, the third option under a \$3.2B contract.

\$506.7 Million - RTX from NASA for instruments and related services for the Landsat Next weather satellite.

\$476.5 Million - Leidos from NASA, a 5 year contract for analytical and physical processing services for the International Space Station, Artemis, and other programs.

\$438.6 Million - General Electric from the Defense Logistics Agency to support F-110 engine module supplies.

News

- NATO guaranteed a path for Ukraine's future into NATO.
- Boeing to resume Dreamliner deliveries to China.
- Northrop Grumman unveiled the design of XRQ-73, a DARPA uncrewed air system.
- GE demonstrated a new hypersonic, dual-mode ramjet.
- Booz Allen invested in Quindar, a commercial space company with a platform to automate satellite operations. The firm also acquired PAR Government Systems to expand its defense business related to imagery and communications.
- Boeing commercial aircraft deliveries rose in June, to its highest monthly totals since January.
- Collins Aerospace (RTX) detailed investments to build out its additive manufacturing capabilities for aerospace hardware at a recent event.
- Boeing is acquiring Spirit Aerosystems at a \$4.7 billion valuation. In addition to bringing commercial aviation structural components in-house to more closely monitor quality control issues, the deal includes activities related to the military's B-21 bomber, V-280 Valor rotorcraft, and CH-53K helicopter. A mid-2025 close is anticipated.
- The Kratos Erinyes Hypersonic Test Bed successfully completed its first launch and flight.

Total Return (Avg Annual %)	
1-Year	22.44%
3-Year	11.78%
5-Year	10.56%
10-Year	13.40%
15-Year	15.51%
Since Inception	11.98%
Morningstar, through 6/30/2024	

Price Return by Decade (ex div)		
	2000-2009	2010-2019
SPADE Defense	310.26%	189.73%
S&P 500	97.07%	[24.11%]
Alpha (bps)	12,053	12,118
Alpha (%)	120.53%	121.18%

Index Performance (ex div)			
	SPADE Defense Index	S&P 500	Alpha (bps)
YTD	11.33%	14.48%	[315]
2023	17.70%	24.23%	[653]
2022	8.56%	[19.44%]	2800
2021	6.61%	26.89%	[2028]
2020	[0.73%]	16.26%	[1699]
2019	38.49%	28.88%	961
2018	[8.15%]	[6.24%]	191
2017	28.92%	19.43%	949
2016	17.95%	9.53%	842
2015	3.23%	[0.73%]	396
2014	11.77%	11.39%	38
2013	48.27%	29.60%	1867
2012	16.30%	13.41%	289
2011	[2.75%]	[0.00%]	[275]
2010	9.62%	12.78%	[316]
2009	21.71%	23.45%	[174]
2008	[38.03%]	[38.49%]	46
2007	22.17%	3.52%	1964
2006	19.33%	13.62%	571
2005	5.30%	3.00%	230
2004	20.47%	8.99%	1148
2003	37.27%	26.38%	1089
2002	[2.87%]	[23.37%]	2050
2001	0.94%	[13.04%]	1488
2000	4.98%	[10.14%]	1512
1999	15.31%	19.53%	[422]
1998	6.63%	26.67%	[2004]

About the SPADE Defense Index®

The SPADE Defense Index (NYSE: DXS) provides an investment benchmark for the value that the market ascribes to companies involved with defense and its homeland security, and space components. The Index is designed to reflect the broad diversity of activities that is representative of companies involved with the sector—naval vessels, military aircraft, armored vehicles, helicopters, drones and remotely piloted vehicles, missiles and missile defense, command and control, secure communications, battlespace awareness, intelligence and reconnaissance, and space systems, as well as national/homeland security activities including border security, biometric screening systems, and military AI and cybersecurity efforts. SPADE Indexes, founded in 2004, specializes in designing and managing equity benchmarks for ETF and other products.

Rules

The SPADE Defense Index was designed to be RIC (registered investment company) compliant for the purpose of enabling financial products. Companies are required to meet an eligibility criteria that includes market valuation (>\$250M), listing on a major US exchange, and have sufficient liquidity. Importantly, each firm must be considered systematically important to the defense of the United States and their defense business is systematically important to the revenues and health of the firm. We follow an enhanced modified market cap methodology that employs our TrueCap™ strategy, enabling the index to more accurately handle firms with diversified operations. Full details can be found at: www.spadeindex.com/defense

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