

**SPADE Defense Index Ends 3Q24 at a Historic High
Index Up Nearly 25% YTD
Assets Tracking This Benchmark Hit \$4.4 Billion**

- The Upcoming US Presidential Election: What It Means for Defense Investing
- Status of Conflicts: Russia/Ukraine and Israel/Iran & Proxies
- What Happens to Defense Securities When One or Both Conflicts Conclude?

COMMENTARY

The Upcoming US Presidential Election

Elections attract a lot of attention in the financial and mainstream media, however, some long held beliefs about political party and equity stock market performance do not match the historical data. When you look back at the stock market since the Great Depression, it reveals that circumstance—periods of inflation, conflicts and security, the timing of technological innovations, etc.—and how we address it, have more to do with the performance than which political party controls the White House and Congress.

The SPADE Defense Index—the benchmark for companies involved with defense and homeland security sectors—has gained during every presidential administration over the past 30 years. Although its performance in individual years has varied, it outperformed the broader market by 120% in each of the past two decades. In the 2020s, the Index is up more than 60%. These gains are a period of time that has featured both Democratic and Republican presidents as well as single party and split party control of Congress. As the historical data reveals, one cannot draw conclusions about future stock market performance based solely and simply on political party.

As a service to the investing community, SPADE Indexes has published a free-to-download report featuring the raw historical stock market performance data so that investors can evaluate how control of the White House and Congress affected the stock market returns of investors over the various administrations.

<https://spadeindex.com/Files/election.pdf>

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SPADE Defense Index Statistics

9/30/24 Close	13,477.20
12/31/23 Close	10,804.91
All-time Intraday High: 30 September 2024	13,480.46
All-time Closing High: 30 September 2024	13,477.20

Price Return	SPADE Defense	S&P 500
3Q24	12.04%	5.53%
YTD	24.73%	20.81%

SPADE Defense Index September 2024 Rebalance

In: RocketLab (NYSE: RKLK)
Out: None

Corporate Actions Affecting the Index During the Quarter

- Jacobs completed the spin/merger of its defense business with Amentum on 9/30. The index did a zero-price spin and converted the cash from Jacobs into additional shares of AMTM.
- Boeing is acquiring Spirit AeroSystems with an anticipated close in 2025.
- Honeywell plans to spin its advanced materials unit, valued at \$11 billion, into a publicly traded company in late 2025/2026.

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.

Dividend

Invesco's Aerospace and Defense ETF issued a dividend of \$0.1330 per share on 23 September 2024. Over the past 12 months, \$0.6526 per share was returned.

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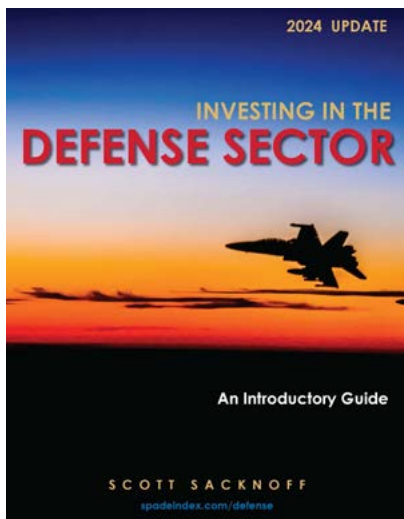
Status of Conflicts: Russia/Ukraine and Israel/Iran & Proxies

To anyone who thought the conflict between Russia and Ukraine as well as the conflict in the Middle East between Iran's proxies and Israel would be over quickly, you were wrong. You are not alone. A recent Center for Strategic & International Studies (CSIS) think tank report was issued to try and identify why professional defense analysts studying Russia got that conflict so wrong. (For those interested in doing a deep dive on this, the report "The Russia-Ukraine War: A Study in Analytic Failure" can be downloaded here: <https://www.csis.org/analysis/russia-ukraine-war-study-analytic-failure>.)

With the conflict between Israel and varying combatants passing year one and the Russia/Ukraine conflict likely to extend through the winter and hit year three, investors are likely wondering...how long with these conflicts last and what happens to securities when one or both of these conflicts conclude. Before we address that, let's review the status of what is happening right now.

Ukraine/Russia: Russia's incursion into Ukraine in early 2022 did not lead to the quick victory that Moscow originally anticipated it would be. By the summer of 2024, what once was a plan to reintegrate Ukraine into Moscow's sphere of influence has likely devolved into a plan to simply outlast Ukraine and come away with additional territory in the eastern part of Ukraine. This, at a minimum, would solidify the

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A New Update to this Classic Guide!

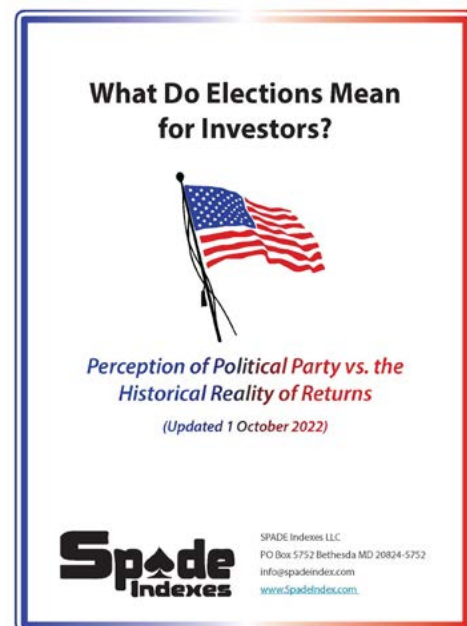
Free Download at

https://spadeindex.com/Files/Investing_Defense_Sector_Guide.pdf

A 58-page educational guide designed to provide investors with a basic understanding of the defense industry and its activities, what drives it, and the unique risks associated with investing in it. It is not meant to recommend or promote any individual company or fund. It is offered for free and can be shared by advisors, analysts, and investors without having to sign in or subscribe.

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>



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hold on land they annexed in Crimea back in 2014—an area Moscow sees as critical for its access to the Black Sea and the Mediterranean region.

However, rather than focus on defense, Ukraine surprised Russian military leaders by going on the offensive—using drones to attack military and energy facilities inside Russian territory and opening up a second front hundreds of miles inside Russia.

The once believed-to-be vaunted Russian military definitely is accumulating its share of embarrassing moments including reports in September that its tanks were getting stuck in traps it previously laid for Ukrainian vehicles. In early October, the *New York Times* reported that Russia's casualties had surpassed 600,000. To continue the flight, it has become necessary for Moscow to acquire weapons, equipment, and additional fighters from Iran, North Korea, and other nations to support its combat operations. Though denied by Moscow, several members of the North Korean military were reported killed in a recent battle.

Meanwhile, Ukrainian President Zelensky recently pitched a victory plan to NATO leaders stating that the current battlefield situation “creates opportunity” to take steps to end the war no later than 2025” and create a lasting stability if their winter activities and plans are successful.

Israel/Iran: Since our last newsletter, instead of Israel declaring victory in Gaza and fortifying their borders, they decided it made sense to “clean house” and remove the threat of Hezbollah who had been firing missiles into northern Israel causing a number of villages to evacuate. It also went after an arms dealer in Syria and a Houthi site in Yemen. Although Israel has removed several members of the leadership of Hezbollah, widely recognized as a terrorist organization, and destroyed thousands of missiles, launch sites, and control centers, sporadic attacks in the name of Hezbollah continue.

The big concern, internationally, is how Israel might retaliate against Iran for firing hundreds of ballistic missiles at Israel (which itself was a retaliation for Israel assassinating key members of Hezbollah and Iranian leadership.) What is the line between retaliation and an action that causes further escalation? Especially in light of the fact that Iran's massive attack failed miserably, with almost all rockets being intercepted before hitting any targets. It is our belief that they have several options: (1) Although the US has said it is against it, Israel could attack Iran's nuclear facilities and remove the threat of nuclear weapons for the time being; (2) They could attack an Iranian drone or rocket factory, reducing their ability to pro-

vide weapons to its proxies in their fights against Israel; (3) They could choose a symbolic attack, sending a single drone/aircraft to bomb an Iranian oil production facility highlighting that Israel is essentially playing nice and could destroy Iranian targets whenever it deems it is necessary whereas Iran could send hundreds of missiles and nothing happens; or (4) Do nothing and state that it finds a direct confrontation with Iran as inconsequential, embarrassing them, and will deal with their proxies as needed. Time will tell which, if any, of these options Israel chooses.

What Happens to Defense Securities When One or Both Conflicts Conclude?

So, what has this meant for investors and what happens to securities when one or both of these conflicts conclude?

First of all, considering the length that these military actions have been ongoing, it should be no surprise that defense stocks have benefited. Investors have had plenty of time to ride the wave. In 2022, the sector (benchmarked by the SPADE Defense Index) rose by 9.51%; 18.41% in 2023, and 26.85% YTD in 2024, at the time of this writing. With neither conflict seemingly close to conclusion, investment analysts consider it likely that asset values will continue to gain over the next several months, at a minimum.

So without specifying an “end-date,” what can investors expect?

Upon the announcement of a cease-fire or declaration of peace, it is likely that defense stocks will decline as those looking to book profits as the weak hands head for the exits. How far it may drop is hard to predict, but investors who feel they “missed” their window to sell will likely be rewarded when companies report sales and earnings in the coming quarters. Most of the systematically-important defense firms have been reporting record backlogs, sometimes reflecting several years of future revenues already on the books; and the government contracts to produce equipment and supplies will not dry up once the war ends. The need to replenish what has been expended is a real issue. Additionally, DoD will likely invest in updated systems based on in-the-field experiences, such as a heavier use of drones. Combined with it likely being several years before the fear associated with a destabilized world and the threats posed by nations such as Russia, China, Iran, North Korea, etc. dissipates, and spending on security is not anticipated to return to previous levels anytime soon.

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As we've discussed in prior commentaries, our research indicates that holding a portfolio of defense stocks that tracks the SPADE Defense Index has never lost principal over a rolling 30-month period after reinvesting dividends. This has held true since 1980 and includes the peace dividend of the 1990s, the aftermath of 9/11, and the US exiting Iraq and Afghanistan—a trend that has held for nearly four decades.

Wall Street Journal

The [defense] sector has done better during periods in which the Federal Reserve embarked on a cycle of interest rate cuts. - 11 October 2024

Backlog Update

As we approach the 3Q24 earnings reports, eyes will be on the backlog...does it continue to increase, hold steady, or are firms finally delivering and reporting more sales. Here's what the largest prime contractors reported in 2Q24 as their backlog:

- Boeing: \$437 billion
- RTX: \$206 billion
- Lockheed Martin: \$158 billion
- General Dynamics: \$91 billion
- Northrop Grumman: \$83 billion

By The Numbers

\$140.9 Billion - Amount the Pentagon has committed to Northrop Grumman for the LGM-35A Sentinel ICBM.

\$44 Billion - Canada confirmed it will pursue a new conventionally-powered, under-ice capable submarine to replace the aging Victoria-class submarines.

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

\$13 Billion - GE chosen to overhaul GENx-2B engines for the USAF Domsday aircraft. In April, Sierra Nevada secured a \$13B contract to build the Survivable Airborne Operations Center to succeed the Boeing E-4 Advanced Airborne Command Post Nightwatch planes.

\$9.6 Billion - HII Ingalls Shipbuilding to construct 4 amphibious warships -- 3 Flight II San Antonio-class warships and advanced procurement, design, and construction of the future LHA-10, Helmand Province—for the US Navy.

\$6.7 Billion - General Dynamics NASSCO for 8 US Navy John Lewis-class fleet oilers.

\$4.1 Billion - The US State Department approved the sale of KC-46A Pegasus tankers to Japan to bolster their refueling capabilities.

\$3.5 Billion - The US State Department approved the South Korea purchase of 36 Boeing Apache AH-64E helicopters.

\$3.2 Billion - Lockheed Martin from the US Air Force, a multi-year missile contract to produce the Joint Air-to-Surface Standoff Missile and Long Range Anti-Ship Missile.

\$3 Billion - Amount of the CHIPS and Sciences Act allocated to the Pentagon to secure a domestic microelectronics supply chain as part of the \$52 billion initiative.

\$2.56 Billion - Boeing from the US Air Force to develop two rapid prototype E-7A Wedgetail aircraft to replace aging E-3 Sentry AWACS fleet.

\$2 Billion - RTX to supply Standard Missile-3 Block IIA interceptors for the US and Japanese navies.

\$2 Billion - RTX from the US Army to begin production of Lower Tier Air and Missile Defense Sensor radar systems.

\$1.5 Billion - Defense startup Anduril raised new capital in a funding round that gave it a \$14 billion valuation.

\$1.46 Billion - Northrop Grumman from the US Navy to supply 9 E-2D Advanced Hawkeye aircraft with 4 designated for the Navy and 5 for Japan.

\$1.3 Billion - General Dynamics Electric Boat from the US Navy for long lead materials to build the first Block VI Virginia-class nuclear submarines.

\$1.3 Billion - The US Army awarded a joint venture of Lockheed Martin a contract to produce 4,000 Javelin anti-tank weapons, the largest single-year deal to date in the program's history to replenish what the US has sent to Ukraine.

More "By The Numbers" on page 5

By The Numbers (continued)

\$1.23 Billion - Poland to Raytheon Polska to produce M903 launchers for the Patriot air defense system.

\$1.1 Billion - RTX from a dozen allied nations—Bahrain, Canada, Japan, and Ukraine—for Lot 38 AMRAAM missiles.

\$1.05 Billion - Raytheon from US Air Force for F-22 Raptor sensor upgrades.

\$1 Billion - Emirates SkyCargo ordered 5 Boeing 777 Freighters to increase its cargo capacity.

\$990 Million - Aerovironment from the US Army for Switchblade drone loitering munition.

\$823 Million - Leidos DoDNet task order from DISA under a broader \$11.5 billion contract.

\$600 Million - The US State Department approved Slovakia's Foreign Military Sales purchase of 12 AH-1Z attack helicopters, 26 T-700 GE 401C engines, and related equipment and services from Textron Bell and GE.

\$592 Million - RTX from Romania for AIM-120C-8 AMRAAM missiles for its F-16 fleet or aircraft.

\$517.1 Million - RTX Pratt & Whitney from the US Navy in contract modifications to provide spares for the F-135.

\$506 Million - Booz Allen from the US Army to develop and integrate combat systems for vertical lift platforms.

\$491 Million - General Dynamics from the Space Development Agency for satellite ground systems.

\$458 Million - HII Mission Technologies to update cybersecurity for DoD communications and IT networks.

\$325 Million - RTX from the US Air Force to increase production of the GBU-53/B StormBreaker missile

\$322.7 Million - General Dynamics from the US Army for early model M10 Booker light battle tanks.

\$625.1 Million - Textron from the Navy for materials and to build nine next gen landing Ship-to-Shore Connector craft.

Technology, M&A, New Programs

- GE announced the successful demonstration of a new hypersonic, dual-mode ramjet which tripled the airflow of its previous hypersonic engines.
- Airbus 20-year demand forecast for jetliners, predicted that the global fleet will more than double due to airline modernization of long-haul fleets and Asia's growing air travel market with industry-wide deliveries of 42,430 new airplanes, up 4% over the previous survey.
- ViaSat unveiled a Secure Wireless Hub, a 2.2 lb, wearable secure communications system developed in collaboration with the US Special Operations Command.
- Northrop Grumman unveiled a Cannon-Based Air Defense System which uses Bushmaster Chain Guns to counter threats like drone swarms and cruise missiles.
- General Dynamics Information Technology acquired Iron EagleX, a company specializing in AI and cybersecurity for US Special Forces.

- Honeywell announced it plans to spin off its advanced materials unit into a publicly traded company valued at \$11 billion by Barclays in 2025/2026.
- The Missile Defense Agency has chosen Northrop Grumman to design an interceptor capable of defeating hypersonic weapons in the glide phase of flight.
- The US Space Force told Congress it plans to spend \$1 billion over the next five years on Resilient GPS satellites that ensure military and civilian users have access to reliable positioning, navigation, and timing signals. The four companies chosen to compete are L3Harris and private firms Astranis, Axient, and Sierra Space.
- A report on EU competitiveness written by former Italian prime minister and European Central Bank chief Mario Draghi stated that European Union countries are buying too much of their defense equipment from abroad, which currently amounts to almost two-thirds from the United States.

3Q24 Leaders

1	RocketLab	102.71%
2	Palantir	46.86%
3	Curtiss Wright	41.22%
4	LOAR Holdings	39.66%
5	Mercury Systems	37.09%
6	AXON International	35.81%
7	Howmet	29.14%
8	Parsons	26.73%
9	Lockheed Martin	25.15%
10	Parker Hannifan	24.91%

3Q24 Laggards

1	Boeing	[16.47%]
2	Triumph Group	[16.35%]
3	C3.ai	[16.33%]
4	AAR Corporation	[10.10%]
5	Oshkosh Truck	[7.38%]
6	Jacobs Engineering	[6.31%]
7	TTM Technologies	[6.07%]
8	ViaSat	[6.05%]
9	Amphenol	[3.28%]
10	Honeywell	[3.20%]

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

Exchange / Ticker	NYSE / PPA
Assets (9/30/2024)	\$4.3 B
Closing Price (9/30/2024)	\$114.97
Dividend Yield*	0.99%
3Q2024 Volume**	12.7 Million
Turnover*	18%
Morningstar Rating*	**** (4-Star)
* Morningstar ** Yahoo Finance - 9/30/2024	

Capture Ratio	3-Yr	5-Yr	10-Yr
Upside	95	87	104
Downside	53	81	76

2024 YTD Results

1	Palantir	116.66%	28	OSI Systems	17.65%
2	Howmet	85.24%	29	KBR	17.54%
3	RocketLab	75.95%	30	General Dynamics	16.38%
4	Curtiss Wright	71.77%	31	Cadre Holdings	15.70%
5	LOAR Holdings	65.76%	32	TTM Technologies	15.43%
6	Parsons	65.33%	33	Kratos Defense	14.83%
7	Aerovironment	59.08%	34	L3 Harris	12.94%
8	CACI International	55.80%	35	Northrop Grumman	12.80%
9	AXON International	54.69%	36	SAIC	12.03%
10	Leidos	50.59%	37	Textron	10.15%
11	General Electric	47.76%	38	AAR Corporation	4.74%
12	ATI	47.15%	39	Spirit Aerosystems	2.30%
13	Heico	46.18%	40	Huntington Ingalls	1.83%
14	Raytheon Tech.	44.00%	41	Mercury Systems	1.18%
15	BWX Tech.	41.67%	42	Jacobs Engineering	0.85%
16	Transdigm	41.08%	43	Keysight Tech.	[0.10%]
17	Leonardo DRS	40.82%	44	Honeywell	[1.43%]
18	Moog	39.54%	45	Teledyne Tech.	[1.93%]
19	Eaton	37.63%	46	Elbit Systems	[6.17%]
20	Parker Hannifan	37.14%	47	CAE	[13.15%]
21	Amphenol	31.48%	48	C3.ai	[15.60%]
22	Lockheed Martin	28.97%	49	Hexcel	[16.16%]
23	Booz Allen	27.25%	50	Triumph Group	[22.26%]
24	Ducommun	26.45%	51	Iridium	[26.02%]
25	Woodward	25.99%	52	Boeing	[41.67%]
26	Barnes Corp.	23.84%	53	Viasat	[57.28%]
27	V2X	20.28%			

Portfolio Price/Earnings	23.88	Beta (3-yr)	0.80
Portfolio Price / Book	4.49	Alpha (3-yr)	10.01
Portfolio Price / Sales	2.09	R-squared (3-yr)	50.57
Portfolio Price / Cash Flow	20.43	STD Deviation	18.44
Long-Term Earnings	14.69	Sales Growth	5.11
Historical Earnings	3.81	Cash Flow Growth	12.44
		Book Value Growth	7.39

Total Return (Avg Annual %)		Price Return by Decade (ex div)			Index Performance (ex div)			
1-Year	47.86%		2000-2009	2010-2019		SPADE Defense Index	S&P 500	Alpha (bps)
3-Year	17.11%	SPADE Defense	310.26%	189.73%	YTD	24.73%	20.81%	392
5-Year	12.81%	S&P 500	97.07%	[24.11%]	2023	17.70%	24.23%	[653]
10-Year	15.22%	Alpha (bps)	12,053	12,118	2022	8.56%	[19.44%]	2800
15-Year	15.41%	Alpha (%)	120.53%	121.18%	2021	6.61%	26.89%	[2028]
Since Inception	12.54%	SPADE Defense 2020-Present			2020	[0.73%]	16.26%	[1699]
Morningstar, 10/7/2024		68.67%			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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