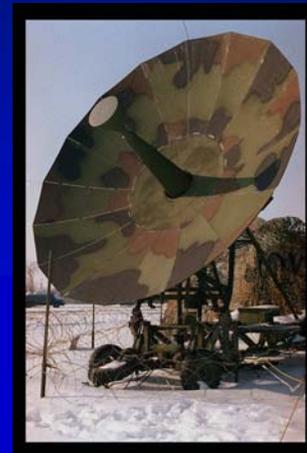


2019



Investing in the Defense, Homeland Security, and Space Market

Prepared by: Scott Sacknoff

SP♠DE[®] Defense Index

Index: 'DXS'
Exchange Traded Fund*: 'PPA'

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Inside the Numbers...

- **\$8.5 Trillion** – Amount Spent by the U.S. on defense in the last decade
- **4-5% of U.S. GDP** – Estimated amount spent on defense
- **\$1.74 Trillion** – Amount Spent Globally on Defense Activities **
- **\$717 Billion** – FY19 U.S. Defense Budget Authority
- **\$79.8 Billion** – Budget for ‘Classified Military and Intelligence Items’ *
- **\$451 Billion** – Growth in U.S. Defense Budget Between FY-97 and FY-17 (since the launch of the SPADE Defense Index)

* *Defense News 31Oct18* ** *SIPRI 2017*

Before we get started...

...Who We Are

The SPADE Defense Index was developed by sector executives familiar with index management in cooperation with leading Wall Street firms in order to benchmark the investment performance of companies operating in defense, homeland security, and space. It is the *only* index to focus on all aspects of the defense sector – from the manufacture of aircraft, naval vessels, tanks, and missiles, to current and future modernization efforts related to IT and network centric warfare, armor and armored vehicles, secure communications, UAVs, satellites, border security, and battlespace awareness.

- Ticker NYSE: DXS
- Weighting Modified Market Capitalization
- Constituents/Rules 51 (January 2019) / \$100M+ Market Cap, \$5+ share price, liquidity
- Historical Data Availability 30 December 1997 to present, Index went live on 6 July 2004
- Index Manager Consulting group with expertise in defense, space, security, investing
- Calculation & Distribution NYSE / ICE Data Services

- Investable Products: Invesco Aerospace & Defense ETF (NYSE: PPA)
- ETF IPO Date: 26 October 2005
- ETF Liquidity / Assets As of January 2019: 100,000+ avg shares/day, ~\$800 Million AUM

Why Defense? An Old Quote That Stays True

"How To Profit from a Stronger America" LOUIS RUKEYSER's Wall Street Week

How Long Will the Military-Spending Boom Last?

A good long while, it appears. Even after the current war on terrorism cools down (which itself could take years or decades), there are plenty of other conflicts to keep the weapons-makers busy. Right now, there are more than 30 insurgencies, uprisings, struggles, guerrilla movements and full-fledged wars being waged worldwide.

Sadly, the business of war is a growth business and has been so for a while.

... the money spigot flowing from the Pentagon to defense contractors won't be turned off anytime soon. After all, if you're going to be the world's policeman, you'd better have a powerful pistol.

One last thought: ***While it would be wonderful if the demand for weapons dried up tomorrow, thousands of years of human history argue against it... Wall Street is engaged in the realpolitik of investing, not wishful thinking. No one ever improved the world—or their financial lot in it—by ignoring the way the world really works.***

(1Mar04)

Defense Is...

Manufacturing

- **Aircraft**
- **Ships / Naval Vessels**
- **Armored Vehicles / Tanks**
- **Missiles & Rockets**
- **Space / Satellites**
- **Unmanned & Robotic Vehicles**

Services

- **Communications**
- **Command & Control**
- **Intelligence Gathering**
- **Reconnaissance/Surveillance**
- **Data Analysis**
- **Border Security**
- **Cybersecurity**

The SPADE Defense Index is the only defense index that reflects all activities that are systematically important to the DoD...not just manufacturing.

A Quick History Lesson ...

Like many other industries, the defense industry goes through cycles.

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

- Aggressors
- New Technologies

During the 20th century, there has been a major U.S. military action within every 20-year period.

U.S. Military Actions

- 1914 - 1918 WWI
- 1939 - 1945 WWII
- 1950 – 1953 Korean War
- 1945 – 1985/1991 Cold War
- 1959 – 1975 Vietnam War
- 1991 Gulf War
- 2001 – 2011/14 War on Terror
- Present The ISIS Threat

The Portfolio Managers' View

Investors discover the benefits of investing in companies involved with defense, homeland security, and space

- Growth - Solid Returns that have outperformed the S&P500 consistently since 2000
- A Hedge Against Portfolio Risk - Associated with world events such as war/terrorist action.
- A Hedge Against Economic Downturns - Sales & earnings of defense companies are not directly tied to changes in the economy. Escalation clauses in many contracts allow price increases due to inflation.
- Diversification – A portfolio that can provide exposure to industrial manufacturing, technology, services, and non-defense activities
- A Stable and Long-Term Customer and Business Base
Notably a key client whose mission is fundamentally more important than the cost to implement
- Dividends – Offered by many defense companies
- Significant Barriers to Entry– Security, contracting, relationships, etc.

How Defense Companies Grow

1. Rising Budgets for the Department of Defense
2. Supplemental Budgets to fund the Global War on Terror & ISIS
3. Outsourcing – Increased Hiring of Private Companies to Do Tasks Previously Performed by Military Personnel
4. Increasing International Sales as Foreign Governments Ramp-up Their Capabilities
5. Acquisitions – A steady supply of emerging small companies
6. An Investment Cycle Associated with the Military Transformation from One Leaner and More Mobile to Put People and Equipment Further Out of Harms Way
7. 'Internal' Diversification – Defense companies maintain a range of skills and technologies that in some cases are of use to non-military customers diversifying (to some degree) their revenue stream.

Representative Firms: Annual Global Defense Revenues >\$500M

Lockheed Martin	Textron	Vectrus
Boeing	Leidos	Oshkosh Defense
Raytheon	SAIC	Engility
General Dynamics	Booz Allen	Cubic
Northrop Grumman	CACI	Moog
L-3 Communications	Rockwell Collins	Curtiss-Wright
Huntington Ingalls	Aerojet Rocketdyne	ViaSat
United Technologies	CSRA	AAR Corp
Honeywell	ManTech	Ball Aerospace
Harris	Booz Allen	Elbit Systems

A Two-Decade Long Rally

Since Inception, PPA has more than doubled the return of the S&P500



A Two-Decade Long Rally

- **Since 2000**, the SPADE Defense Index has had only four down years
- The SPADE Defense Index has outperformed the S&P500 in 6 of the past 7 years.
- The SPADE Defense Index has outperformed the broader market in 15 of the past 19 years
- In two of the four years it underperformed, the index gained 21.71% and 9.62%.
- **Since 2000**, the SPADE Defense Index has gained a whopping 483.8%!

Period	SPADE (DXS)	S&P 500
2000	4.98%	[10.14%]
2001	0.94%	[13.04%]
2002	[2.87%]	[23.37%]
2003	37.27%	26.38%
2004	20.47%	8.99%
2005	5.30%	3.00%
2006	19.33%	13.62%
2007	22.17%	3.53%
2008	[38.03%]	[38.49%]
2009	21.71%	23.45%

Period	SPADE (DXS)	S&P 500
2010	9.62%	12.78%
2011	[2.75%]	0.00%
2012	16.30%	13.41%
2013	48.27%	29.60%
2014	11.77%	11.39%
2015	3.23%	[0.73%]
2016	17.95%	9.53%
2017	28.92%	17.95%
2018	[8.15%]	[6.24%]

Calculated by SPADE Indexes using publicly available end-of-year pricing data for both indexes

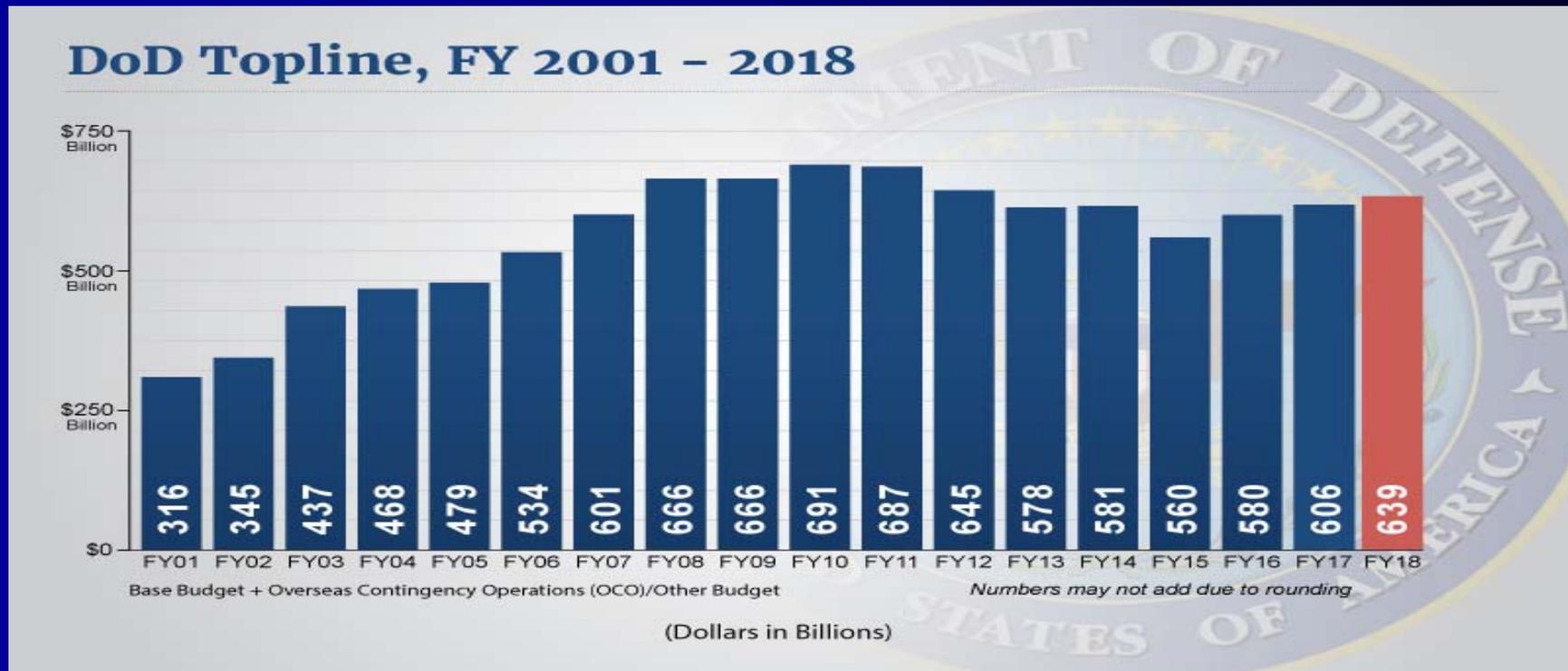
Driver #1 An Unstable Global Situation

Defense spending is in part insurance against global risk and change. Below are just some of the current global political situations monitored by U.S. defense authorities.

- **North Korea**
- **China Naval Incursions in the Pacific**
- **Tension Between China and Taiwan**
- **Turkey / President Erdogan**
- **Syrian Civil War**
- **Iran / Nuclear Tensions**
- **Instability in Iraq**
- **Nigeria / Boko Haram**
- **ISIS / ISIL Around the Globe**
- **Disintegration of the EU Model**
- **Yemini / Saudi Arabia Crisis**
- **Central American Drug / Gang Wars**
- **Hypersonic Missile Developments**
- *Unforeseen/Unpublicized Events*

Driver #2 The Department of Defense Budget

In FY2019, the DoD budget was \$716 Billion.



Although down from its 2010 peak, U.S. spending has been remained stable.

Driver #3 International Defense Sales

US Defense Suppliers are less reliant on the U.S. DoD budget than ever before. Global sales are more than compensating for changes in the U.S. defense budget

- The United States spends **35%** of the total spent worldwide on defense²
- Combined, in 2017 the world spent \$1.74 Trillion on defense²
- For FY18, the State Department OK'd foreign military sales worth \$55.6B, up 33%.¹
- \$192.3B in combined weapons sales in 2018, up 13%, with total direct commercial sales of \$136.6B, up 6.6%.¹
- Lockheed Martin expects foreign sales in 2017 of 30%, up from 17% in 2013. Raytheon generates nearly 1/3 of its sales from international clients.¹

Total Global Defense Spending²

- USA 36%
- China 13%
- Saudi Arabia 5.2%
- Russia 4.0%
- UK 3.3%
- India 3.1%
- France 3.0%

1 Defense News

2 SIPRI

Driver #4

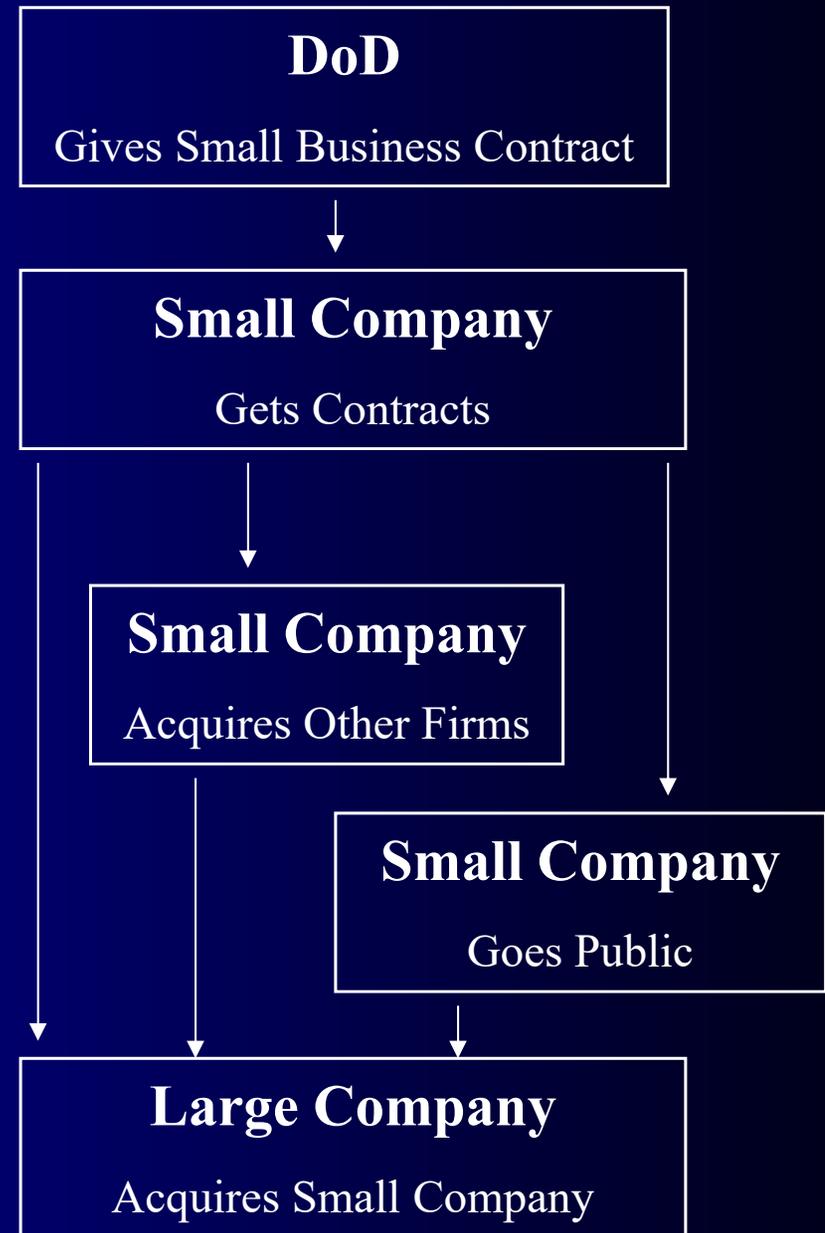
Acquisitions

On average, the defense sector sees several hundred deals annually

- *mostly small, <\$100 million*
- *mostly private*

The acquisitions provide...

- *exposure to long-term contracts*
- *key personnel (& clearances)*
- *access to classified programs and personnel*
- *technology & capabilities*



Driver #5

Technology

DoD's mission is to maintain capabilities that allow our military to have an advantage over an enemy or possible enemy. **The RDT&E budget is +/- \$70 billion annually – making it the largest investor in advanced technology in the world.**

Many new systems are developed over 10-15-20 year timeframes.

Areas of interest include:

- IT/Network Centric Warfare, Battlefield Visualization, Data Visualization
- Armor and Protection against IED/mines
- Robotic Vehicles & Drones, GPS, and other technologies that put the soldier and equipment further out of harm's way

- **1916 – 1918 WWI**
 - Aircraft, the tank, 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

Driver #6

Diversification

- *The larger defense firms tend to work on multiple contracts for different agencies and programs.*
- *Employ their skillset toward contracts from non-military agencies such as NASA, Dep't of Energy, HHS, etc.*
- *Maintain a number of commercial and non-defense related enterprises*
- *Commercial Aerospace: International carrier orders for aircraft is in a multi-year manufacturing cycle expected to run to the early 2020s.*

Using recent company investor presentations, 10K filings, and details on the Defense News Top 100:

- *47.1% of revenues are defined as from defense clients (global vs. US whenever possible) ¹*
- *Excluding non-defense revenues from Boeing, United Technologies, and Honeywell, raises this total to nearly 70% ¹*
- *Commercial aerospace revenues make up nearly a third of the total and reflect a dynamic acquisition market for aircraft. ¹*

¹ SPADE Indexes Research

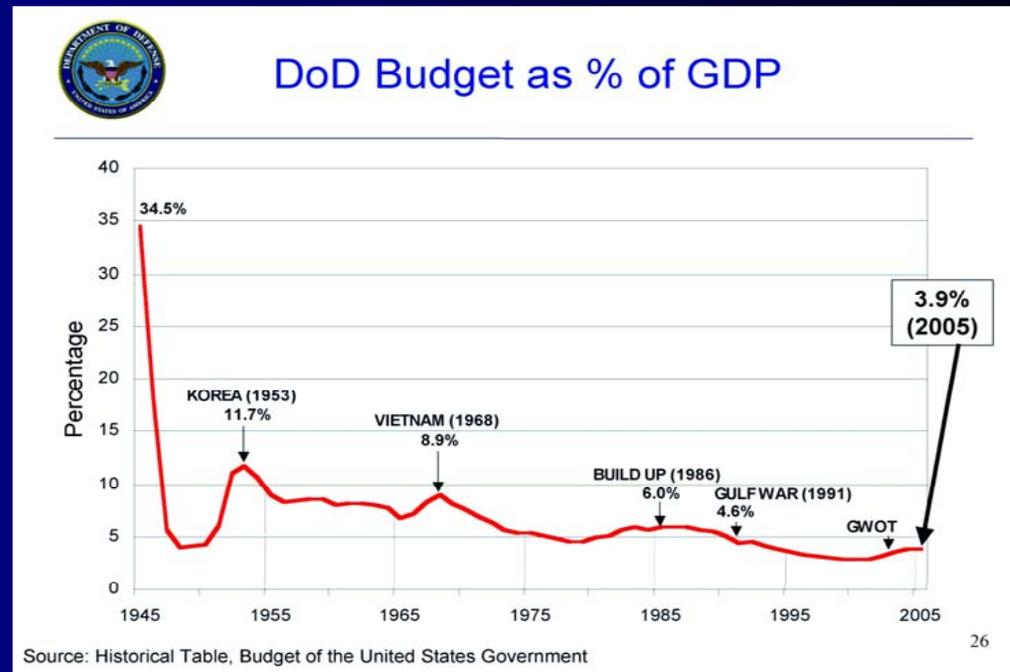
Misperceptions vs. Reality

The Belief

We're spending more today than ever on defense and security

The Reality

In WWII, the U.S. spent 34.5% of GDP on the war effort. We now spend 4-5%



Misperceptions vs. Reality

The Belief

**Sector investing
adds risk**

The Reality

- Not necessarily and not always. Aerospace and Defense may be the perfect “buy and hold” investment.
- Using historical index data from 1997 to the present and a rough backtest to the Reagan Administration in 1980—at any point in time an investor would recoup their principal within three years after reinvesting dividends. How many sectors can claim that over a 37 year timeframe?
- Most importantly...the world has not changed and remains unstable. A cyclical downturn in defense is not foreseen.

Misperceptions vs. Reality

The Belief

The Trump Administration ensures high levels of defense spending.

The Reality

- Possibly, but in the world of politics nothing is guaranteed. Still, Trump has made defense and border security a high proprietary and will likely not use it as a bargaining chip.
- We'd be remiss if we take this for granted. There are a number of members within Congress and factions of the Republican Party who would be against an increase in the budget for any reason.

Conclusions

Many money managers believe that defense sector investments should be a *core part* to a portfolio

1. The reasons behind the defense sector's growth (namely a response to a volatile world) will be with us for some time.
2. The amount the U.S. spends to protect its interests (~ 4-5% GDP) and offer economic and emotional stability to its citizens is reasonable
3. Investor interest in defense sector companies and equity funds is growing

For More Information ...



Visit www.spadeindex.com to learn about:

- Index Rules / Methodology
- Index Constituents and Details
- Links to historical data and performance

Index: DXS
Licensed ETF:
PPA

To download our complimentary newsletter,

The SPADE Investor, visit www.spadeindex.com/defense

Contact Information

SPADE® Defense Index
P.O. Box 5752
Bethesda, MD 20824-5752
Tel: (703) 524-2766

Scott Sacknoff, Index Manager