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# Defense Industry Access to Capital Markets: Wall Street and the Pentagon, An Annotated Brief

Berteau, David; Levy, Roy; Ben-Ari, Guy; Moore, Cornelia

Monterey, California. Naval Postgraduate School

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WEDNESDAY SESSIONS  
VOLUME I

**Defense Industry Access to Capital Markets: Wall Street and the  
Pentagon, An Annotated Brief**

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Levy, Guy Ben-Ari, and Cornelia Moore, Center for Strategic &  
International Studies

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GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY  
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The research presented at the symposium was supported by the Acquisition Chair of the Graduate School of Business & Public Policy at the Naval Postgraduate School.

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## Preface & Acknowledgements

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During his internship with the Graduate School of Business & Public Policy in June 2010, U.S. Air Force Academy Cadet Chase Lane surveyed the activities of the Naval Postgraduate School's Acquisition Research Program in its first seven years. The sheer volume of research products—almost 600 published papers (e.g., technical reports, journal articles, theses)—indicates the extent to which the depth and breadth of acquisition research has increased during these years. Over 300 authors contributed to these works, which means that the pool of those who have had significant intellectual engagement with acquisition issues has increased substantially. The broad range of research topics includes acquisition reform, defense industry, fielding, contracting, interoperability, organizational behavior, risk management, cost estimating, and many others. Approaches range from conceptual and exploratory studies to develop propositions about various aspects of acquisition, to applied and statistical analyses to test specific hypotheses. Methodologies include case studies, modeling, surveys, and experiments. On the whole, such findings make us both grateful for the ARP's progress to date, and hopeful that this progress in research will lead to substantive improvements in the DoD's acquisition outcomes.

As pragmatists, we of course recognize that such change can only occur to the extent that the potential knowledge wrapped up in these products is put to use and tested to determine its value. We take seriously the pernicious effects of the so-called “theory–practice” gap, which would separate the acquisition scholar from the acquisition practitioner, and relegate the scholar's work to mere academic “shelfware.” Some design features of our program that we believe help avoid these effects include the following: connecting researchers with practitioners on specific projects; requiring researchers to brief sponsors on project findings as a condition of funding award; “pushing” potentially high-impact research reports (e.g., via overnight shipping) to selected practitioners and policy-makers; and most notably, sponsoring this symposium, which we craft intentionally as an opportunity for fruitful, lasting connections between scholars and practitioners.

A former Defense Acquisition Executive, responding to a comment that academic research was not generally useful in acquisition practice, opined, “That's not their [the academics'] problem—it's ours [the practitioners']. They can only perform research; it's up to us to use it.” While we certainly agree with this sentiment, we also recognize that any research, however theoretical, must point to some termination in action; academics have a responsibility to make their work intelligible to practitioners. Thus we continue to seek projects that both comport with solid standards of scholarship, and address relevant acquisition issues. These years of experience have shown us the difficulty in attempting to balance these two objectives, but we are convinced that the attempt is absolutely essential if any real improvement is to be realized.

We gratefully acknowledge the ongoing support and leadership of our sponsors, whose foresight and vision have assured the continuing success of the Acquisition Research Program:

- Office of the Under Secretary of Defense (Acquisition, Technology & Logistics)
- Program Executive Officer SHIPS
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- Office of Procurement and Assistance Management Headquarters, Department of Energy

We also thank the Naval Postgraduate School Foundation and acknowledge its generous contributions in support of this Symposium.

James B. Greene, Jr.  
Rear Admiral, U.S. Navy (Ret.)

Keith F. Snider, PhD  
Associate Professor



## Panel 11 – Economic Dimensions of the Information Technology Age

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<b>Wednesday, May 11, 2011</b>	
<b>3:30 p.m. – 5:00 p.m.</b>	<p><b>Chair: Douglas A. Brook</b>, Director, Center for Defense Management Research, NPS; former Assistant Secretary of the Navy (Financial Management &amp; Comptroller)</p> <p><b><i>Defense Industry Access to Capital Markets: Wall Street and the Pentagon, An Annotated Brief</i></b></p> <p style="padding-left: 40px;">David Berteau, Director of the Defense-Industrial Initiatives Group, Roy Levy, Guy Ben-Ari, and Cornelia Moore, Center for Strategic &amp; International Studies</p> <p><b><i>The Impact of Economic Austerity on U.S. and European Defense Industrial Bases</i></b></p> <p style="padding-left: 40px;">Nayantara Hensel, Chief Economist, Department of the Navy</p> <p><b><i>Creating and Sustaining Effective Partnership Between Government and Industry</i></b></p> <p style="padding-left: 40px;">Steve Mills and Scott Fouse, DAU, and Allen Green, SAIC, Inc.</p>

**Douglas A. Brook**—Professor of Public Policy and Director of the Center for Defense Management Research in the Graduate School of Business and Public Policy, Naval Postgraduate School. Professor Brook served as Dean of the NPS Business School from 2002 until 2005. Dr. Brook teaches Defense Budgeting and Financial Management Policy. His current research interests focus on budgets, financial reporting, and management reform in the federal government and the Department of Defense. Previously, Professor Brook has served as Assistant Secretary of the Army (Financial Management), Assistant Secretary of the Navy (Financial Management & Comptroller), Acting Under Secretary of Defense (Comptroller), and as Acting Director of the U.S. Office of Personnel Management.



## Defense Industry Access to Capital Markets: Wall Street and the Pentagon, An Annotated Brief

**David Berteau**—Senior Adviser and Director, CSIS Defense-Industrial Initiatives Group, covering defense management, programs, contracting, and acquisition. Mr. Berteau's group also assesses national security economics and the industrial base supporting defense. Mr. Berteau is an adjunct professor at Georgetown University, a member of the Defense Acquisition University Board of Visitors, a director of the Procurement Round Table, and a fellow of the National Academy of Public Administration. He also serves on the Secretary of the Army's Commission on Army Acquisition and Program Management in Expeditionary Operations. [DBerteau@csis.org]

**Roy Levy**—Consultant, Defense-Industrial Initiatives Group at CSIS. Mr. Levy focuses on financial aspects of the U.S. defense industrial base. Before joining CSIS, Mr. Levy was a policy analyst with a New York City–based economic research firm and a fellow at the Colin Powell Center for Policy Studies between 2007 and 2009. Prior to that, Mr. Levy worked at a New York–based hedge fund and served in the Israeli Defense Forces' Armor Corps. Mr. Levy holds a BA in Political Economy from the City University of New York and studied Mandarin at Beijing Language and Cultural University.

**Guy Ben-Ari**—Deputy Director, Defense-Industrial Initiatives Group at the Center for Strategic International Studies. Mr. Ben-Ari works on projects related to the U.S. technology and industrial bases supporting defense. His current research efforts involve defense R&D policies, defense economics, and managing complex defense acquisition programs. Mr. Ben-Ari holds a bachelor's degree in Political Science from Tel Aviv University, a master's degree in International Science and Technology Policy from the George Washington University, and is currently a PhD candidate (ABD) at the George Washington University.

**Cornelia Moore**—Research Intern, Defense-Industrial Initiatives Group (DIIG) at the Center for Strategic and International Studies. Ms. Moore previously interned at the U.S. Department of State in the Office of Political-Military Affairs, as well as at Merrill Lynch in Private Wealth Management. She recently graduated from the University of Southern California, receiving a BA in international relations and in Russian studies.

### Abstract

Private companies rely on cash raised from capital markets to finance their operations, including expenditures on long-term assets (such as facilities and equipment), independent research and development (IRAD), and retirement of old debt. Capital markets play a role in shaping the depth and breadth of the U.S. defense industry and the capabilities it has to offer, as well as in the cost of these capabilities to the Department of Defense.

This paper presents interim findings of research on defense companies' access to capital markets. The research is ongoing, and a final version, including policy recommendations, will be presented at the May 2012 Naval Postgraduate School Annual Acquisition Symposium.

### Introduction

In its FY2010 Quadrennial Defense Review (QDR), the Department of Defense (DoD) recognized the importance of the investment community to the well-being of the defense industry. Specifically, the QDR emphasized the importance of access to capital to the defense industry's health, stating that “the Department must ensure that we do not take this access to capital for granted and must work to form a more transparent view of our requirements and long-term investment plans” (DoD, 2010).



Industry executives voice similar concerns. In a newspaper interview, the chief financial officer of a large private firm with a significant defense business said that “the core issue [for defense companies] is the difficulty in matching the heavy demands of customers against the ambitious financial returns expected by investors” (Michaels, 2010).

Capital markets are composed of a wide variety of investors with an even wider array of investment objectives and strategies. This analysis focuses on two key elements of capital markets: the equity and bond markets. Equity investors invest money in a company in return for a claim on the company’s profits, proportionate to the number of shares they own as a percent of total shares. Bond investors lend money to a company for a specific period at a specific interest rate. Unlike shareholders, who have a claim on the company’s profits, lenders are entitled to receive the same payment every period until all the principal and interest are repaid. Lenders (debt) and owners (equity) have different claims on a company. Nevertheless, decisions about which companies to invest in, and for what level of return, are derived from the same set of accounting, financial, and risk fundamentals.

This research paper analyzes the attractiveness of the U.S. defense industry to capital markets based on financial metrics, including profitability, cashflows, and liquidity, as well as relative market valuation. The aim is to provide quantitative evidence on the financial health of the defense industry, both historically and compared to the broader commercial market.

## **Methodology**

This research paper is divided into three valuation categories: profitability, liquidity, and market relative valuation. While these categories are by no means exhaustive, they contain fundamental data regarding companies’ financials that are of interest to existing and potential investors. The study focuses on metrics that are capital structure neutral and thus relevant for both equity owners and debt holders. The data are taken from commercial databases and companies’ financial reports. The analysis also draws upon interviews with Wall Street analysts and buy-side investment professionals.

To examine and assess the financial performance of the defense sector, and to capture the diversity of companies within it, the Defense-Industrial Initiatives Group (DIIG) created the CSIS Defense Index. The CSIS Defense Index is composed of 32 public companies with annual revenue ranging from \$180 million to \$45 billion, representing not only hardware and equipment firms, but also the professional services sector. The CSIS Defense Index includes a number of legacy defense firms, as well as foreign companies with significant presence in the U.S. defense market. In choosing companies for the CSIS Defense Index, DIIG focused on publicly traded firms with a preponderance of revenue from military-use products and services. At times, the inclusion of a given company depended on the availability of financial data. See Appendix A for a list of companies.

The analysis of the CSIS Defense Index is twofold. First, the CSIS Defense Index is benchmarked against the components of the S&P 500 (excluding financial and defense firms) and the industrial components of the S&P 1500 (excluding defense firms). Second, the CSIS Defense Index is broken down into subcategories that are measured against their respective commercial counterparts.

Recognizing the diversity of companies in the CSIS Defense Index, the DIIG team divided the index into three sub-indices: CSIS Defense Professional Services (DPS) Sub-Index; CSIS Hardware & Equipment (H&E) Sub-Index; and the CSIS Diversified Sub-Index. The CSIS DPS Sub-Index is composed of companies whose majority of revenue derives from services. The CSIS H&E Sub-Index is composed of companies whose majority of





revenue derives from manufacturing. The CSIS Diversified Sub-Index is composed of companies with significant revenue from both defense professional services and manufacturing.

To evaluate the performance of the sub-indices of the CSIS Defense Index, the research team identified comparable commercial companies from the S&P 1500 Index. CSIS used Standard & Poor's Global Industry Classification Standards (GICS) to sort the S&P 1500 by sectors, industry groups, industries, and sub-industries. This breakdown allowed the research team to identify commercial companies with comparable business mix to those of the sub-indices of the CSIS Defense Index. Of the comparable companies identified, the research team excluded companies whose most recent three-year average revenue exceeded or fell below the range of the three-year average revenue of the CSIS sub-index they were to benchmark. The three benchmarks are as follows: Commercial & Professional Services; Commercial Hardware & Equipment; and Commercial Diversified.

The Commercial & Professional Services benchmark includes companies from GICS Industry Group 2020 *Commercial and Professional Services*, including diversified support services, environmental and facilities services, office services and supplies, security and alarm services, human resources and employment services, and research and consulting services. DIIG also chose to include information technology services companies from GICS Industry 451020 *IT Consulting & Other Services* in order to ensure a comprehensive comparison of its CSIS DPS Index counterpart.

The Commercial Hardware & Equipment benchmark is composed of companies whose majority of revenue derives from manufacturing. It includes companies from three GICS industries: *Technology Hardware and Equipment* (4520), specializing, among other things, in electronics manufacturing and communications equipment; *Construction & Farm Machinery* (201060), specializing in the design and manufacturing of premium light-, medium-, and heavy-duty trucks; and *Electrical Components & Equipment* (201040), specializing in electrical, electromechanical, and electronic products.

Finally, the research team employed a slightly different methodology in selecting a commercial benchmark for the CSIS Diversified Sub-Index. The unique nature of the companies in the CSIS Diversified Sub-Index, encompassing both products and services, did not allow for a parallel comparison to a GICS category. As a result, DIIG identified six companies with a comparable size profile (by revenue) to the six companies in the CSIS Diversified Sub-Index. Three of the companies are manufacturers and the other three are services companies. The result is a Commercial Diversified benchmark, whose total revenue is split nearly evenly among services and manufacturing, thus mimicking the profiles of companies within the CSIS Diversified Index. For a list of benchmark companies, see Appendix B.

It is important to note that the following analysis aggregates financial data for a large number of companies over a period of 20 years. This posed a challenge in standardizing the data across companies and across time. The research team had to apply substantial judgment regarding extreme data points, which may result from an extraordinary, one-time charge for any given company. Nevertheless, the trends seen in the following analysis are indicative of the performance of the defense industry over the period evaluated, and compared to the broader economy. It provides an analytical foundation for understanding the financial health of the defense industry and its attractiveness to capital markets.



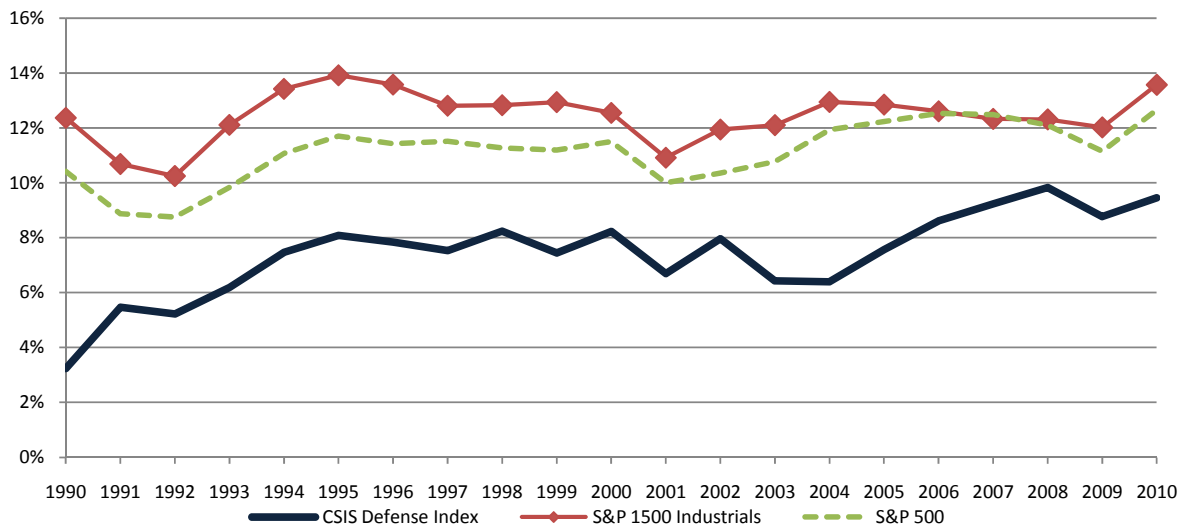
## Data Presentation & Analysis

### Profitability

Defense firms perform a distinctive function in providing the U.S. military with state-of-the-art equipment and services to carry out its missions. They are also, however, like other private-sector companies in that they exist to earn money for their owners, the shareholders. In fact, increasing returns to shareholders is among the most important priorities for the CEO of any company, including any defense company. Profitability metrics are equally important to equity owners and debt holders.

Operating profit margin is the ratio of operating income to revenue. It measures the leftover portion of a company's revenue after paying for variable costs of production such as raw materials, direct labor, and internal research and development, to name a few. The higher the margin, the lower the risk a company will default on its interest and income tax obligations. Generally, higher margin also means that more income is left for shareholders.

Figure 1 compares operating profit margin for the CSIS Defense, S&P 500, and S&P 1500 Industrial Indices between 1990 and 2010. While the CSIS Defense Index's operating margin is higher today than at any point in the past 20 years, it has consistently been lower than those of the commercial indices.

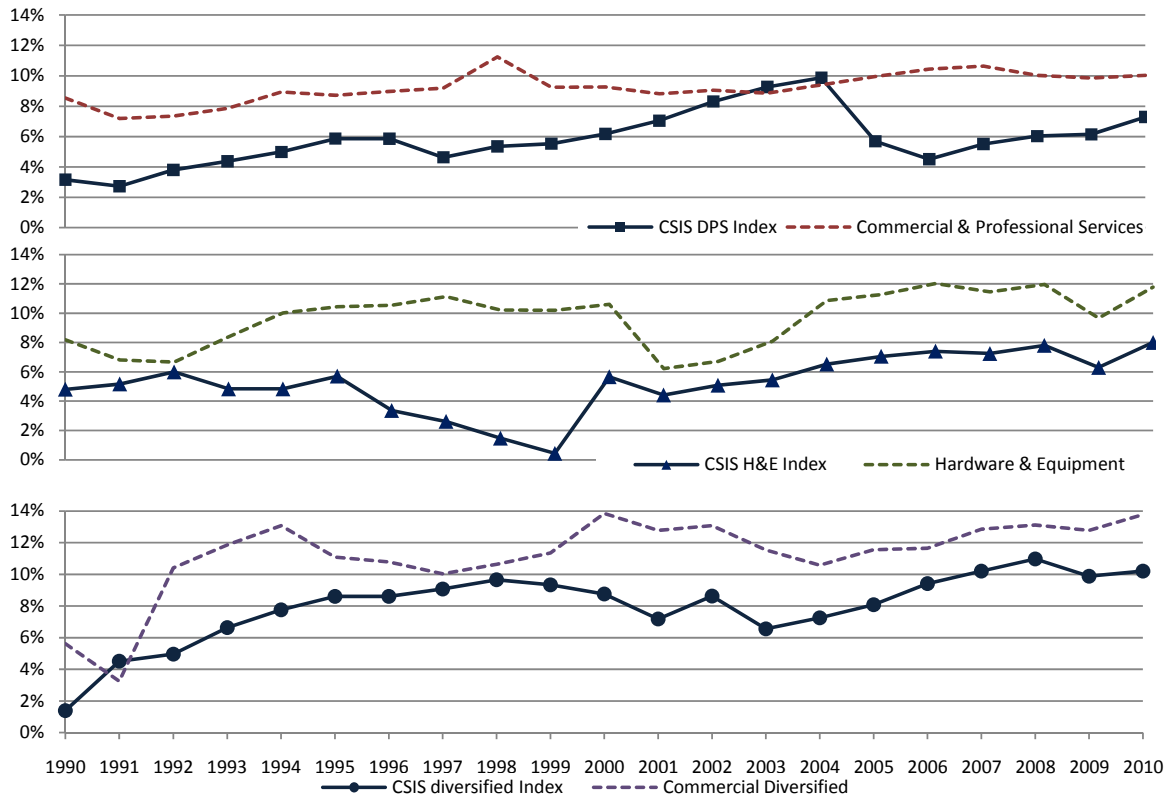


**Figure 1. Operating Margin Comparison, CSIS Defense Index and Commercial Benchmarks, 1990–2010**

*Note.* The source for this figure was Bloomberg, and the analysis was by CSIS Defense-Industrial Initiatives Group.

Figure 2 compares operating profit margin for each of the CSIS Defense sub-indices and their commercial benchmarks. Operating margins for all of the defense sub-indices have been lower than those of their commercial benchmarks. The drop in margin for the CSIS DPS Sub-Index in 2005 likely reflects increased competition as large defense primes entered the professional services market.





**Figure 2. Operating Margin Comparison, Defense Sub-Indices and Commercial Benchmarks, 1990–2010**

*Note.* The source for this figure was Bloomberg, and the analysis was by CSIS Defense-Industrial Initiatives Group.

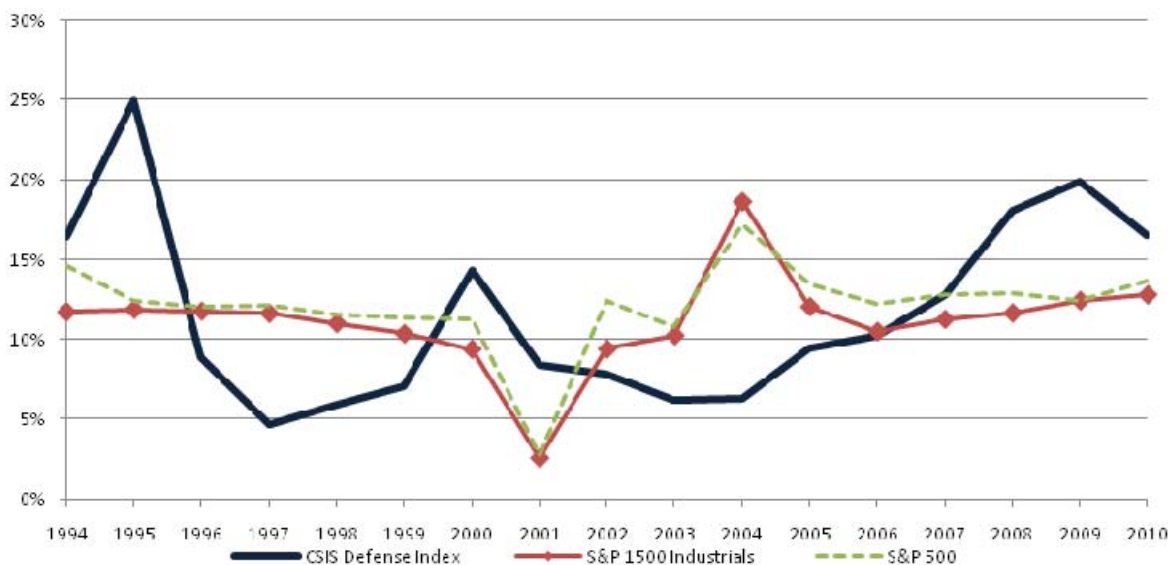
In their 2010 fourth-quarter earnings calls with investment analysts, most industry executives held optimistic views on margin growth for 2011. These views, however, do not fully account for a full-year Continuing Resolution, which has already begun to impact contracts, production ramp-ups, and backlogs.

The consensus among Aerospace & Defense equity research teams at the large investment banks is that operating profit margins for most defense contractors, and specifically for prime contractors, peaked in 2008. While it is unlikely that margins will fall back to their 1990s levels, they are likely to stabilize at the 8–9% range for the foreseeable future.

Cash flow return on investment (CFROI) is another important profitability metric. It is a measurement of the cash flow available after expenses have been paid and sufficient investment has been made to continue current operations. Figure 3 shows CFROI for the CSIS Defense, S&P 500, and S&P 1500 Industrial Indices between 1994 and 2010. By this measure of profitability, CSIS Defense Index companies have generated, on average, higher returns than the broader market for the period. The spike in CFROI between 2007



and 2010 is attributed to strong free cash flow generation (numerator), as well as shrinking capital base (denominator) due in part to debt retirement and share repurchase.<sup>1</sup>



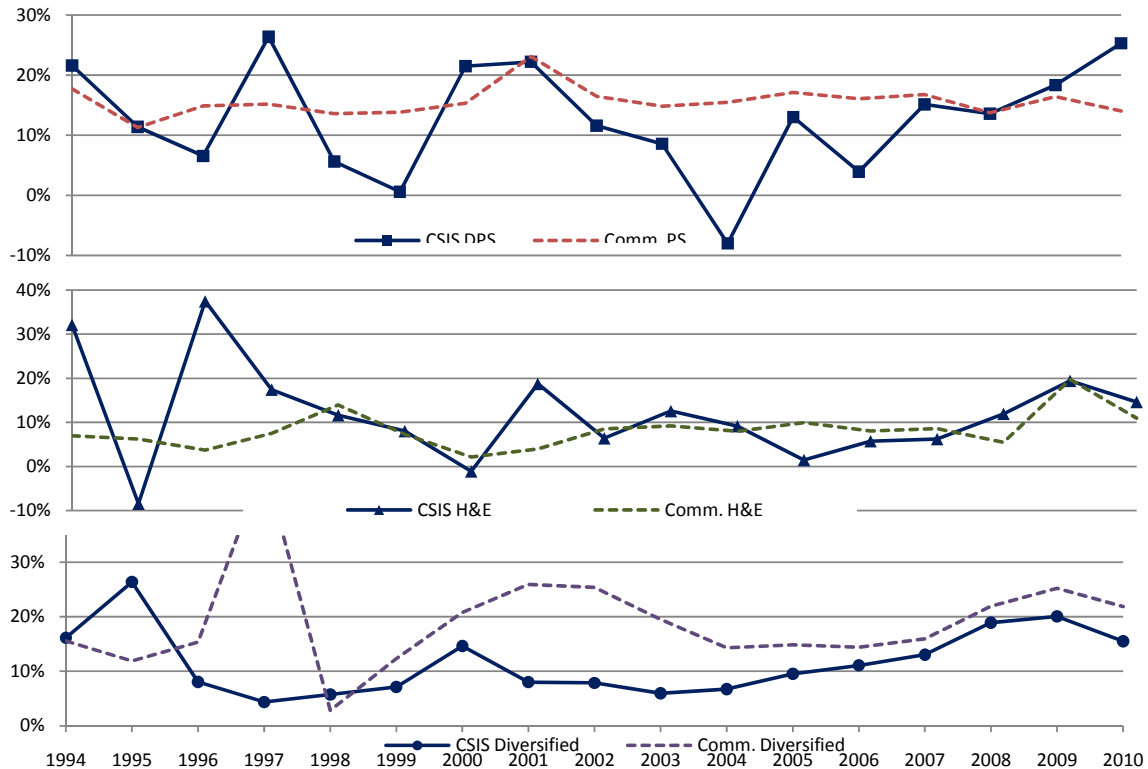
**Figure 3. CFROI Comparison, CSIS Defense Index and Commercial Benchmarks, 1990–2010**

*Note.* The source for this figure was Bloomberg, and the analysis was by CSIS Defense-Industrial Initiatives Group.

Figure 4 compares CFROI for the CSIS Defense sub-indices and the commercial benchmarks. This level of analysis shows a different picture than the previous figure. The CSIS H&E Sub-Index is the only sub-index whose CFROI levels are on par with its commercial benchmark. The CSIS DPS Sub-Index surpassed its commercial benchmark in 2008, at the peak of the current defense cycle. The CSIS Diversified Sub-Index, although trailing its commercial benchmark closely since 2004, has remained historically lower.

<sup>1</sup> To arrive at cash flow, we used EBIT plus depreciation and amortization minus capital expenditures minus the increase in net working capital, which in turn is the sum of accounts receivable and inventory, minus accounts payable. Investment is the sum of long- and short-term debt and shareholders' equity (including preferred stock).





**Figure 4. CFROI Comparison, Defense Sub-Indices and Commercial Benchmarks, 2001–2010**

*Note.* The source for this figure was Bloomberg, and the analysis was by CSIS Defense-Industrial Initiatives Group.

The dynamic between profit margin and CFROI is unique to the defense business model and is important to understand. Defense firms are subject to a form of cost-based profit regulations, broadly referred to as the DoD’s “profit policy.” Two aspects of the DoD’s profit policy are of particular interest: the weighted guidelines and contract finance.

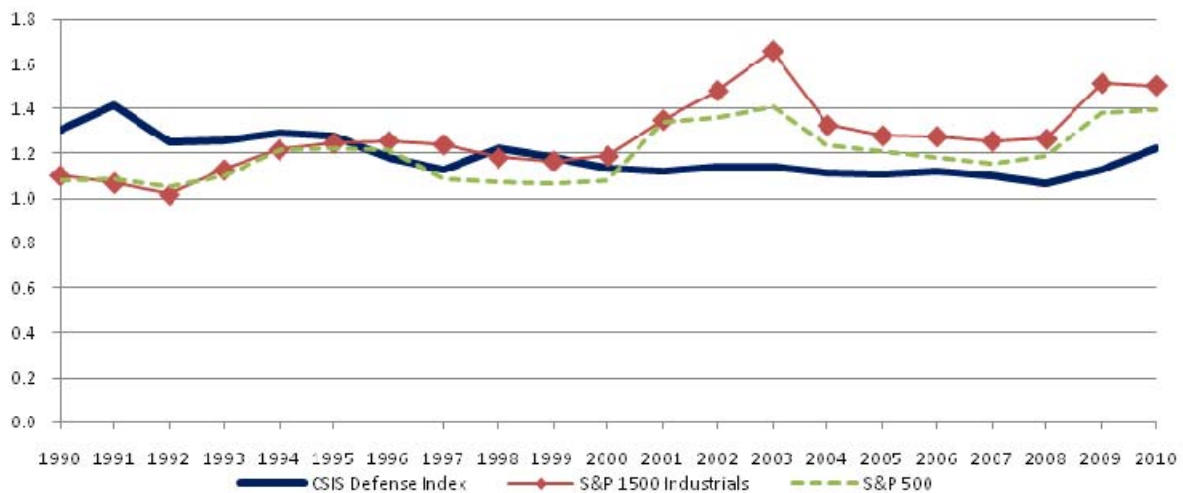
The DoD’s profit policy is governed by the Defense Federal Acquisition Regulation Supplement (DFARS) section 215.404. The rules, collectively known as the weighted guidelines, are composed of four pieces: performance risk, contract risk, facilities capital, and working capital. Each component (and subcomponent) has a “base” profit value, to which a contracting officer may add a percentage based on a preset range. The level of profit or fee a contract is awarded—as a percentage of cost—is based on the amount and type of risk assumed by the contractor. Generally, the lower the risk borne by the contractor, the lower the profit is as a percentage of total cost.

Contract finance is used to fund contractors’ working capital during the development and production of products unique to the military. Contract finance is necessary due to the long acquisition cycle and the high level of uncertainty associated with military technology. Contract finance—or progress payment—is periodic payments to the contractor for the portion of the work completed and includes a share of the profit, or fee. Consequently, contractors use less of their own working capital over the life of a program.

A study published by the Institute for Defense Analyses on the DoD's profit policy concludes that because defense firms use less of their own money to finance programs, they may receive lower margins and still have high returns (Arnold et al., 2009). In effect, margins and CFROI are the opposite side of the same coin. Investors have been willing to accept lower profit margins from defense firms, in comparison with other investment opportunities, in exchange for higher cash flows.

## Liquidity

Liquidity ratios are used by investors to determine companies' ability to meet their short-term financial obligations with their short-term assets. Debt holders usually seek higher liquidity multiples to ensure that a firm will not default on its obligations. Shareholders generally prefer lower liquidity multiples because they prefer more of their money to be at work, generating returns. The DIIG research team focuses on three liquidity ratios, representing a mix of cash flow statement and balance sheet metrics.



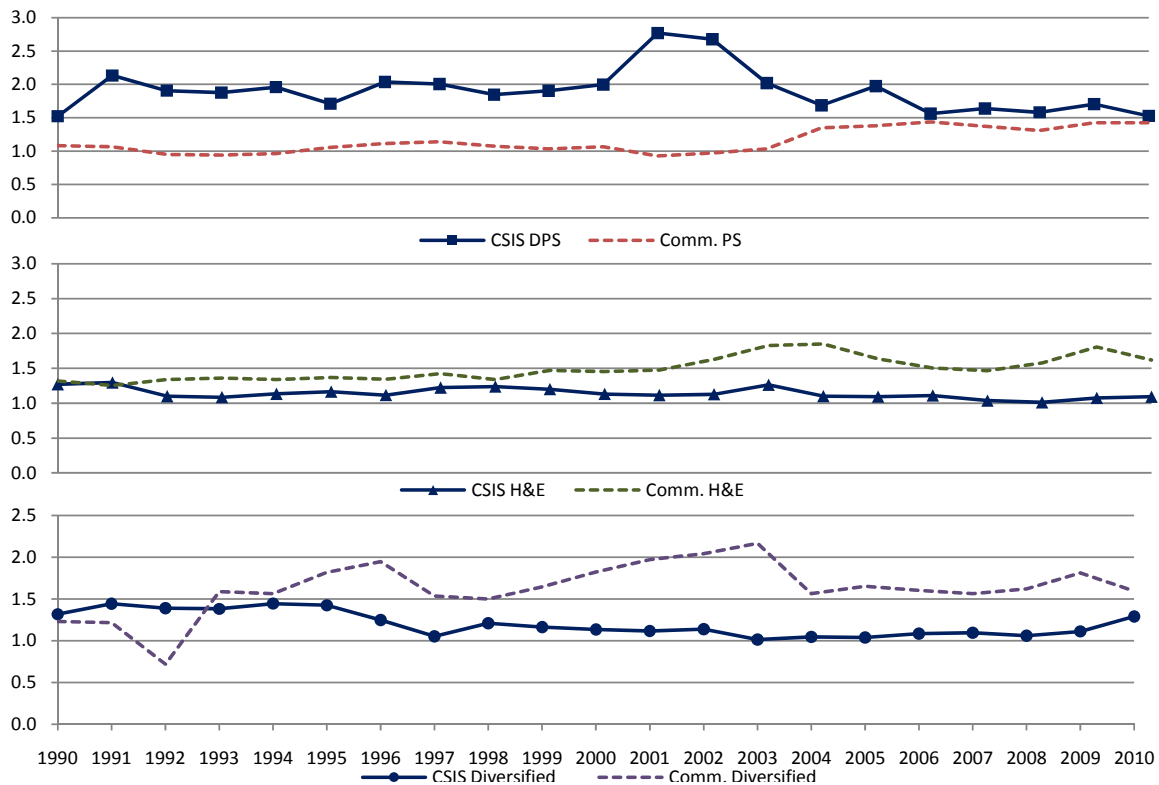
**Figure 5. Current Ratio Comparison, CSIS Defense Index and Commercial Benchmarks, 1990–2010**

*Note.* The source for this figure was Bloomberg, and the analysis was by CSIS Defense-Industrial Initiatives Group.

The current ratio is the ratio of a firm's current assets to its current liabilities. Current assets are the sum of cash and cash equivalents, marketable securities, accounts and notes receivable, and inventories. Current liabilities are the sum of accounts payable, short-term debt, and other short-term liabilities. A current ratio greater or equal to 1 implies that a company is able to meet its current obligations with its current assets.

The current ratio of the CSIS Defense Index has been relatively constant during the period and slightly below the commercial indices in the past decade.

Figure 6 depicts the current ratio multiples of the CSIS Defense Sub-Indices and their commercial benchmarks. Among the defense sub-indices, the CSIS DPS Sub-Index has had the highest current ratio, with short-term assets at about 1.5–2 times its current liabilities for the period. The DPS Sub-Index is also the only defense sub-index whose current ratio exceeds that of its commercial benchmark.

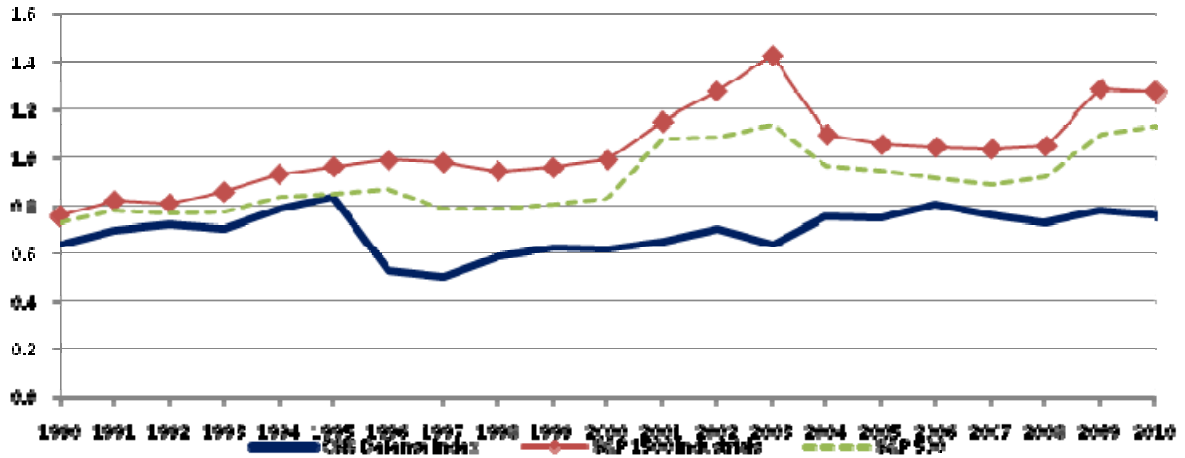


**Figure 6. Current Ratio Comparison, Defense Sub-Indices and Commercial Benchmarks, 1990–2010**

*Note.* The source for this figure was Bloomberg, and the analysis was by CSIS Defense-Industrial Initiatives Group.

The quick ratio is considered to be more conservative than the current ratio because it excludes inventories from a company’s current assets. The rationale behind this is that inventories are harder to convert into cash in a relatively short period of time to cover short-term financial obligations. This assumption holds true for defense companies, given the fact that they operate in a near monopsony market while their main customer, the Department of Defense, operates on a preset procurement schedule.

Figure 7 compares the quick ratio for the CSIS Defense, S&P 500, and S&P 1500 Industrial Indices between 1990 and 2010. Once inventories are excluded from the current assets, the liquidity of defense firms drops significantly. It appears that by this measure of liquidity, CSIS index companies cannot meet their short-term obligations with their short-term assets.

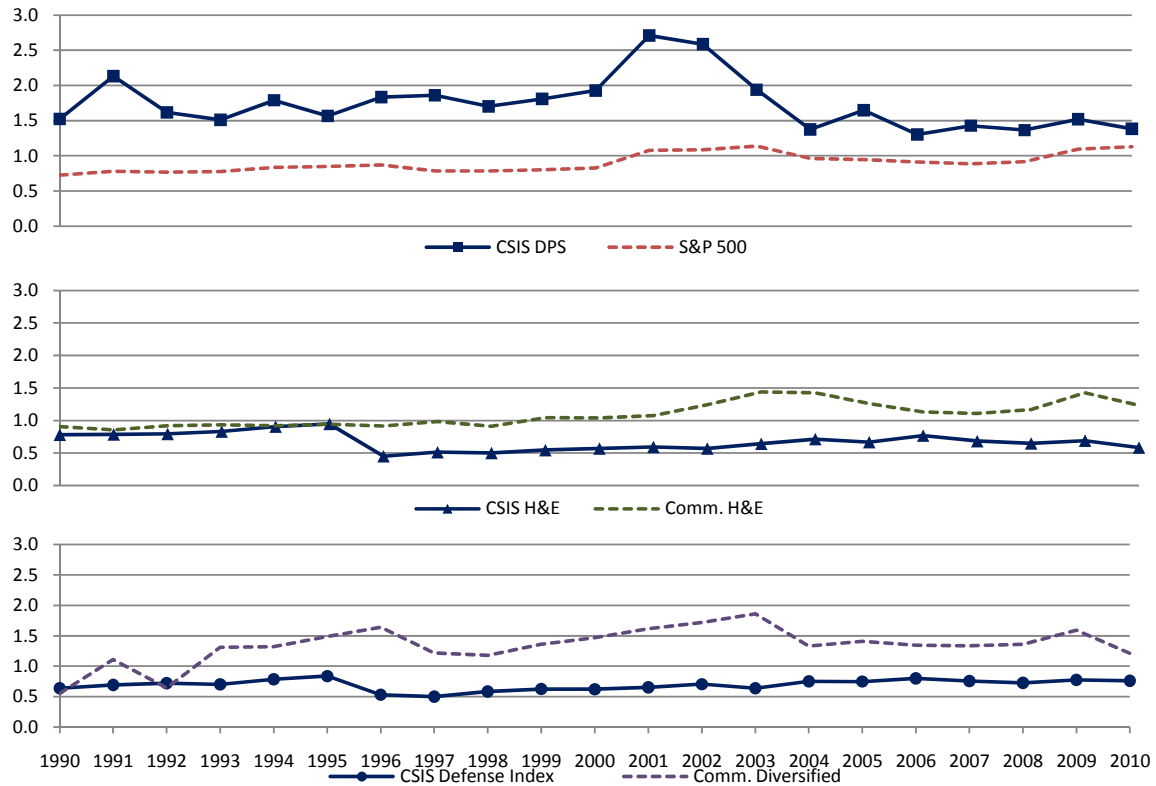


**Figure 7. Quick Ratio Comparison, CSIS Defense Index and Commercial Benchmarks, 1990–2010**

*Note.* The source for this figure was Bloomberg, and the analysis was by CSIS Defense-Industrial Initiatives Group.

Figure 8 depicts the quick ratio multiples of the CSIS Defense sub-indices and their commercial benchmarks. Again, the CSIS DPS Sub-Index companies are the only companies among the CSIS Defense Index whose multiples are higher than their respective commercial benchmarks.





**Figure 8. Quick Ratio Comparison, Defense Sub-Indices and Commercial Benchmarks, 1990–2010**

*Note.* The source for this figure was Bloomberg, and the analysis was by CSIS Defense-Industrial Initiatives Group.

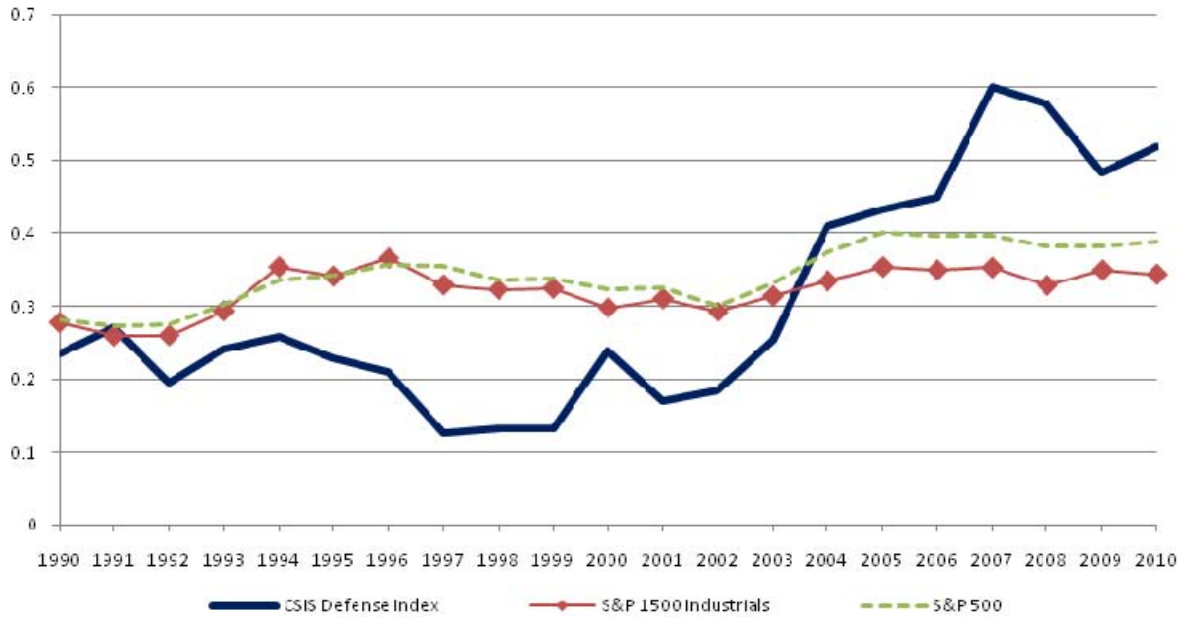
By this measure of liquidity, defense professional services companies are the most liquid among the defense sub-indices, as well as compared to their commercial benchmarks. It is important to note, however, that services firms rarely carry any inventories, which explains the similarities between the current and quick ratios for services companies.

While liquidity multiples for defense companies appear to be lower than those of their commercial benchmarks, defense firms do enjoy a special relationship with their customer, the DoD. As mentioned in the previous section, defense contractors receive advance payments on work done even before the work is completed.

The cash flow to debt multiple measures a company’s operating cash flow to its total debt and is used to determine a company’s ability to repay its debt, specifically with operating cash flow. The higher the cash flow to debt multiple, the more attractive a company is to investors.

Figure 9 compares the cash flow to debt ratio of the CSIS Defense, S&P 500, and S&P 1500 Industrial Indices between 1990 and 2010. The cash flow to debt multiples for the CSIS Defense Index was below that of the commercial indices throughout the 1990s and has climbed with defense budgets beginning in 2002. The strong cash flow to debt multiples in the 2000s are likely due to a mix of strong cash flows and lower debt levels, specifically a reduction in short-term debt toward the end of the period. As defense budgets begin to subside, expectations are that the ratio will decrease again.

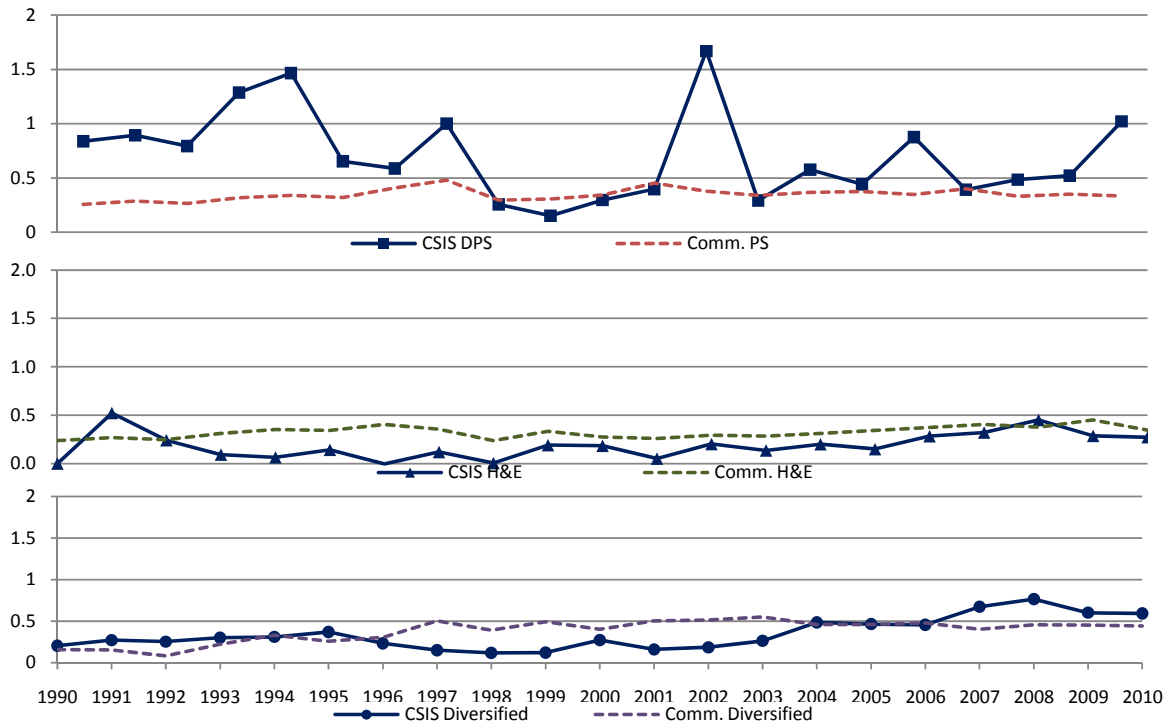




**Figure 9. Cash Flow to Debt Comparison, CSIS Defense Index and Commercial Benchmarks, 1990–2010**

*Note.* The source for this figure was Bloomberg, and the analysis was by CSIS Defense-Industrial Initiatives Group.

Figure 10 compares the operation cash flow to debt ratio for the CSIS Defense sub-indices and their commercial benchmarks. Both the CSIS DPS and Diversified Indices’ ratios are relatively on par with their commercial benchmarks. The CSIS H&E Sub-Index’s multiples are slightly lower than those of its commercial benchmark. As defense budgets begin to subside, expectations are that this ratio will again decrease for defense firms.



**Figure 10. Cash Flow to Debt Comparison, Defense Sub-Indices and Commercial Benchmarks, 1990–2010**

*Note.* The source for this figure was Bloomberg, and the analysis was by CSIS Defense-Industrial Initiatives Group.

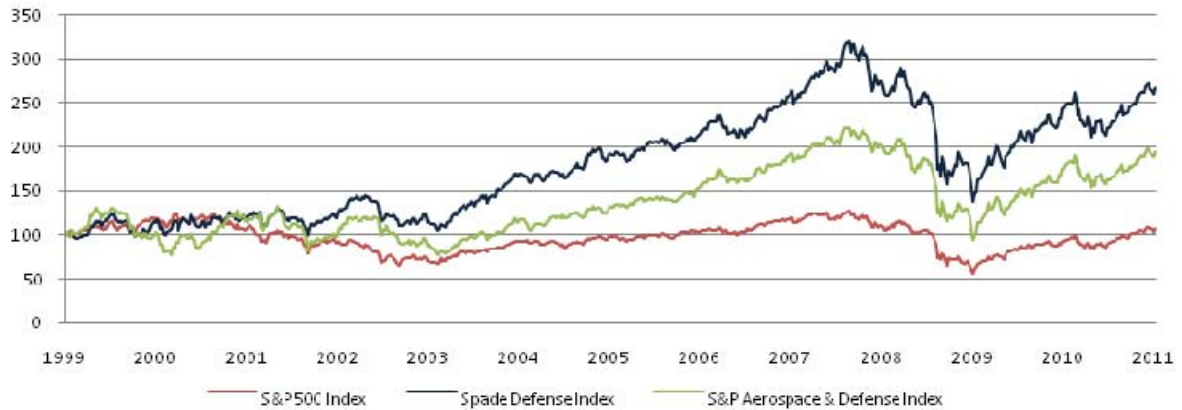
### Relative Market Valuation

The following analysis examines investors’ sentiment based on price and enterprise value multiples. The analysis indicates how markets are pricing a security, or an industry, both historically and relative to commercial benchmarks.

Figure 11 shows the percentage change in share price for the S&P 500, S&P 500 Aerospace & Defense, and the Spade Defense Indices.<sup>2</sup> From 2001 until the stock-market peak in 2007, the Aerospace & Defense indices outperformed the S&P 500 Index. This trend was particularly pronounced from March 2003 until late 2007, the period that saw the most intense fighting in Iraq. From 2007 to 2008, the indices have traded closely together, as investors began anticipating the end of U.S. involvement in Iraq and slower growth in the defense budget. The plunge in the Spade Defense Index in 2008 likely reflects broader investor flight from equity rather than a fundamental change in the financial health of the defense sector.

<sup>2</sup> The Spade Defense Index includes 58 companies operating in the space, homeland security, and defense markets.

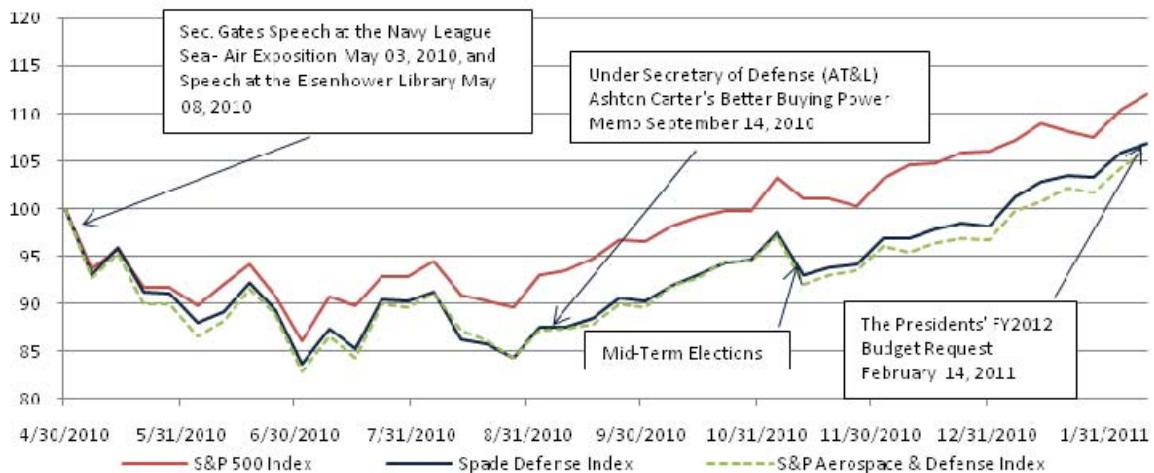




**Figure 11. Index Price Performance, 1999–2010 (1999 = 100)**

*Note.* The source for this figure was Bloomberg, and the analysis was by CSIS Defense-Industrial Initiatives Group.

Figure 12 shows the percentage price change from April 30, 2010, to January 31, 2011,<sup>3</sup> for the same indices depicted in Figure 9. From April 2010 to date, the S&P 500 outperformed the Aerospace & Defense indices, continuing the trends from 2008. The price rally in the Aerospace & Defense indices beginning in August 2010 coincides with a rally in the broader market. Note that Secretary Robert Gates and Under Secretary Ashton Carter’s Efficiency Initiatives have done little to alter share price performance of defense companies. One explanation is that by September 2010, markets already anticipated significant cuts in defense outlays, disregarding Secretary Gates’ promise for a 1% real growth in the base budgets over the FY2011–FY2015 FYDP.



**Figure 12. Index Price Performance, April 2010–March 2011 (April 30, 2010 = 100)**

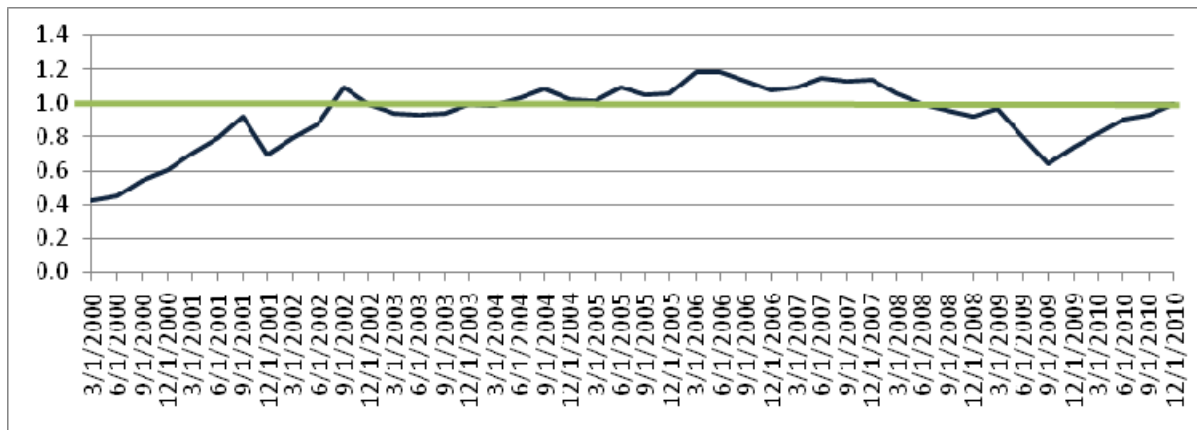
*Note.* The source for this figure was Bloomberg, and the analysis was by CSIS Defense-Industrial Initiatives Group.

<sup>3</sup> The May 2010 date was selected because of Secretary Robert Gates’ speeches at the Navy League and the Eisenhower Library, which mark the beginning of the DoD’s Efficiency Initiatives.

The price to earnings (P/E) ratio is another important indication of investor sentiment. The P/E multiple is the ratio of the current price of a stock and a company's earnings per share (EPS).<sup>4</sup> The DIIG research team used next year's EPS, based on analysts' estimates. The P/E multiple shows how much investors are willing to pay today for every dollar of profit next year and, more importantly, investor expectation of the company's growth prospect. In other words, P/E multiples already account for future expected growth and thus investor sentiment for the future prospect of the company or industry. If investors are optimistic about an industry, its P/E ratio will be above that of its benchmark and vice versa.

Figure 13 shows average forward P/E multiples for the CSIS Defense Index relative to the S&P 500 Index.

From the second half of 2004 through the second half of 2008, the period that saw the most intense fighting in Iraq, defense stocks have traded at a premium to the S&P 500. By 2008, investors became pessimistic regarding future growth prospects in the defense market, as most analysts began anticipating the end of the war in Iraq and slower-growing defense budgets. From 2009 through 2010, the CSIS Defense Index P/E increased, most likely the result of smaller than expected cuts in defense spending as well as increased confidence in the U.S. economic recovery.



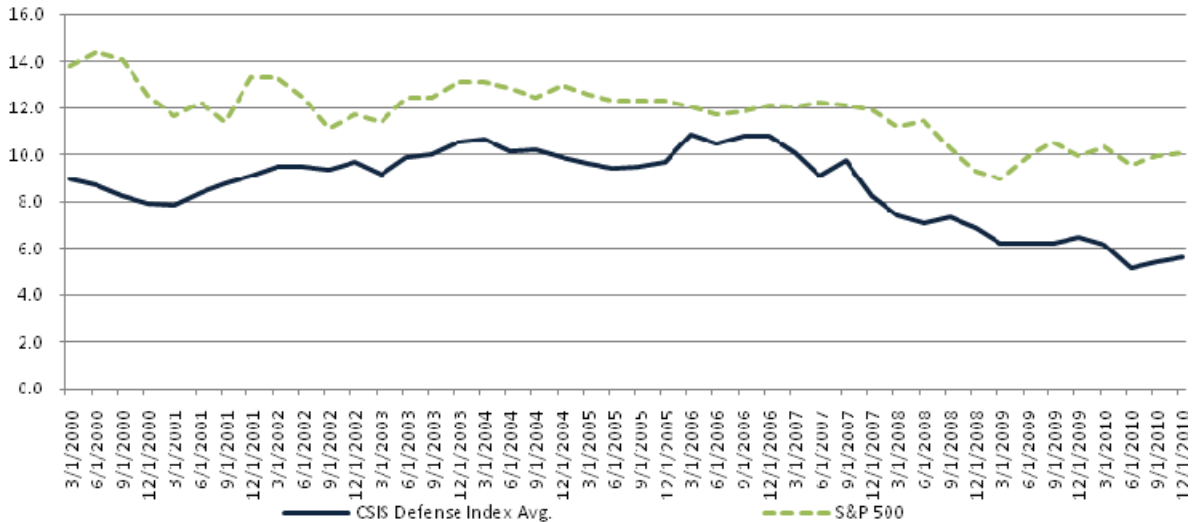
**Figure 13. Forward Relative Price Earning, CSIS Defense Index Average**

*Note.* The source for this figure was Bloomberg, and the analysis was by CSIS Defense-Industrial Initiatives Group.

The Enterprise Value (EV) to Earnings before Interest, Taxes, Depreciation, and Amortization (EBITDA) is another widely used multiple to determine how companies or industries are valued. Enterprise value is the sum of market capitalization, preferred equity, minority interest, short- and long-term debt minus cash and equivalent. Market capitalization is the product of current share price and number of shares outstanding. Unlike the P/E ratio, the EV/EBITDA is capital neutral, meaning that the multiple also accounts for the company's debt. As Figure 14 shows, defense firms are valued at a discount to the broader S&P 500 by this measure.

<sup>4</sup> Earnings per share from continuing operations before one-time, extraordinary items.





**Figure 14. EV to EBITDA Comparison, CSIS Defense and S&P 500 Indices, 2000–2010**

*Note.* The source for this figure was Bloomberg, and the analysis was by CSIS Defense-Industrial Initiatives Group.

## Summary & Conclusions

The analysis above focuses on three valuation categories: profitability, liquidity, and relative market valuation. Although by no means exhaustive, these metrics are most commonly used by financial analysts and are indicative of defense firms’ performance, both historically and compared to commercial peers. The trend analysis shows that CSIS Defense Index performance largely trailed its commercial benchmarks, with the CFROI as the only exception. The trends persisted when the components of the CSIS Defense Index were divided according to business specialization. The analysis of the CSIS Defense sub-indices also showed that the industry is not monolithic, as the performance of each of the sub-indices varied from one another.

The main concern for investors and the DoD is that as defense budgets begin to fall in real terms, as they usually do after a protracted growth period, defense financials, and consequently their market valuation, could further deteriorate. If this happens, defense firms could find capital markets less accessible or, alternatively, could see their cost of capital increase, since debt investors will demand higher interest payments to compensate for the increased risk.

The consensus among Wall Street analysts is that the relatively favorable “terms of trade” the industry enjoyed in the past decade are giving way to a more austere spending environment. Expectations are that defense operating margins have peaked in 2008 and will likely stabilize at the 8–9% range for the foreseeable future.

## Future Research

The final section of this research project, to be presented at the Naval Postgraduate School’s 12th Annual Acquisition Symposium, will look into the DoD’s profit policy as outlined in the Federal Acquisition Regulations (FAR) and the Defense Federal Acquisition Regulations Supplement (DFARS) to determine how the DoD’s policies and practices affect the metrics analyzed above and, hence, the market valuation of defense firms. The aim is to



identify specific policy issues within the DoD's profit and contract practices and their effect on defense companies' fundamentals underlining the common market valuations. For example, if the government decides to pay a contractor for costs incurred by the firm immediately after costs were incurred, the firm will have to use a relatively small portion of its own capital in the process of development or production. As a result, the company's ratio of free cash flow—the cash available to the firm after all expenses have been made and sufficient investment has been made to continue current operations—and the firm's total invested capital—long- and short-term debt plus shareholders' equity—will be higher. Conversely, if the government decides to pay for cost incurred (fees) only at predetermined milestones along the contract, the firm would have to use more of its capital in the process of development and production, resulting in a lower CFROI. Thus, an acquisition officer's decision regarding progress payments has a direct impact on the contractor's cash flow statement and, consequently, the relevant valuation multiples.

The research team will also assess the impact of contract type and budget allocation (both top-line and program levels) on the market's risk perception and its effect on the industry's valuation. For example, industry watchers have argued that multiyear contracts could positively affect a company's valuation by reducing the market's risk perception associated with single-year contracts (McAleese, 2001).

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## Appendix A. CSIS Defense Index

<b>CSIS Diversified Sub-Index</b>	<b>CSIS DPS Sub-Index</b>
Lockheed Martin	GEOEYE
Northrop Grumman	KBR
BAE Systems	VSE
General Dynamics	SAIC
Raytheon	CACI
L-3	ManTech
<b>CSIS H&amp;E Sub-Index</b>	<b>Legacy Companies</b>
Finmeccanica	Martin Marietta
Thales	Lockheed Corp
Alliant Techsystems	Grumman Corp
ELBIT Systems	McDonnell Douglas
GenCorp	Litton Industries
Aerovironment	DRS Technologies
Todd Shipyards	Logicon
Force Protection	Engineered Support Systems
Loral Space & Co	Integrated Defense Technologies
Flir Systems	Newport News



## Appendix B. Benchmarks

<b>Commercial &amp; Professional Services</b>		
<b>Commercial &amp; Professional Services</b>		
ABM	GEO	REPUBLIC SERV
ADMINISTAFF	HEALTHCARE SERV	ROBERT HALF
AVERY DENNISON	HEIDRICK & STRUGGLES	ROLLINS
BRINK'S	HERMAN MILLER	SCHOOL SPECIALTY
CDI	HNI	SFN
CINTAS	INTERFACE	STERICYCLE
CLEAN HARBORS	IRON MOUNTAIN	SYKES ENTR
COPART	KELLY SERVICES	TETRA TECH
CORP EXEC BOARD	KORN/FERRY	TOWERS WATSON
CORRECTIONS OF AMER	MANPOWER	TRUEBLUE
DOLAN	MINE SAFETY APP	UNIFIRST
DUN & BRADSTREET	MOBILE MINI	UNITED STATIONER
EQUIFAX	NAVIGANT	VIAD
FTI	ON ASSIGNMENT	WASTE CONN
G & K	PITNEY BOWES	WASTE MGMT
<b>IT Consulting</b>		
ACXIOM	GARTNER	SRA INTL
CIBER	MAXIMUS	TERADATA
FORRESTER	NCI	



<b>Commercial Hardware &amp; Equipment</b>		
<b>Electronics Manufacturing</b>		
BENCHMARK ELEC	METHODE	PULSE
CTS	MOLEX	RADISYS
JABIL CIRCUIT	PARK	TRIMBLE
MERCURY	PLEXUS	TTM
<b>Technology Hardware &amp; Equipment</b>		
ADTRAN	EMS	POLYCOM
ARRIS	F5	QUALCOMM
BEL FUSE	HARMONIC	RIVERBED
BLACK BOX	HARRIS	SYMMETRICOM
BLUE COAT	JDS UNIPHASE	TEKELEC
CIENA	JUNIPER	TELLABS
COMTECH	NETGEAR	VIASAT
DG FASTCH	OPLINK	
DIGI	PLANTRONICS	
<b>Electrical Components &amp; Equipment</b>		
ACUITY BRANDS	EMERSON	ROPER INDUSTRIES
AMETEK	HUBBELL	THOMAS & BETTS
BELDEN	REGAL-BELOIT	WOODWARD
BRADY	ROCKWELL	
<b>Construction &amp; Farm Machinery</b>		
AGCO	JOY	TORO
BUCYRUS	OSHKOSH	TRINITY
CUMMINS	PACCAR	WABTEC
DEERE	TEREX	

<b>Commercial Diversified</b>		
<b>Services</b>		
JABIL CIRCUIT	MANPOWER	ORACLE
<b>Hardware</b>		
HONEYWELL	ITT	TEXTRON

