

## 2008 Global Aerospace & Defense Industry Performance Wrap-up

A study of the 2008 financial performance  
of 67 global A&D companies with  
revenues exceeding \$1 billion



# Abstract

After several increasingly successful years of financial performance, in 2008 the 67 companies or divisions included in Deloitte's study of the Global Aerospace & Defense (A&D) Industry surpassed their combined revenue, operating earnings and operating margin performance of 2007. Their revenue increased by 7.9% to \$595 billion. Their operating earnings jumped 9.5% to \$54.2 billion while their operating margins increased by 1.5% (13 bps) to 9.11%. Financial performance varied depending on subsector and the region specific factors that impacted key metrics. Since their revenues represent approximately 95% of the revenues for the companies in the overall A&D industry, we believe the results of our study are indicative of the A&D industry as a whole and we will use the term "industry" throughout this report in representing our findings.

Industry highlights are as follows:

- EADS edged out Boeing as the largest A&D industry company in terms of revenue
- European companies grew significantly faster at 9.56%, than U.S. firms at 6.30%, led by EADS's \$5.96 billion revenue growth in 2008.
- Operating margins of 10.17% for the U.S. companies were higher than the operating margins of 7.55% for the European companies, a reflection of the long term difficulty in cutting labor costs and rationalizing facilities for the industry in countries where there is higher government intervention and job protection schemes.
- Two specific factors impacted the industry, preventing an even higher level of performance: the strike at Boeing Commercial Airplanes and the non-cash goodwill impairment charge at year end for Northrop Grumman related to adverse conditions in the equity markets.
- Tier 1 and defense electronics suppliers significantly surpassed OEMs with higher revenue growth and operating margin performance.
- Service companies had higher revenue growth, compared with the industry, but lagged in profitability, reflecting the competitive market in which they operate.

Since approximately 2003, the resurgence of commercial aircraft and business jet sales, the global war on terror, continued productivity improvements in cost structure, substitution of technology for labor in product development and manufacturing, and transformation of the supply chain from vertical integration to the super-supplier model, have all contributed to the success of the industry. These factors, plus the retirement of debt and share buybacks that many of these companies executed in this business cycle, indicates that they are well braced for the current economic downturn.

However, the industry is experiencing a significant challenge with aircraft order deferrals, the global credit crisis, potential cutbacks in large weapons programs, and a likely transformation in the defense acquisition process.

We believe the success in 2009 of the A&D Industry will largely depend on: a) successful continuance of current large scale programs under contract, and backlog protection mitigation actions, b) successful business development efforts globally, in particular the Middle East and India, c) effective management of cost and schedule targets while achieving mission assurance for the customer, d) how they execute strategic leverage in the acquisition space, and, e) the nimbleness with which they can identify and capture technology directions, and funding for emerging defense and security priorities.

# A record setting year for the industry

Deloitte conducted this study of the 2008 financial performance of the industry by assessing the key metrics of performance related to revenue growth, operating earnings and margin, asset effectiveness, cash generation and sales bookings. Industry averages were calculated and compared to prior year performance as well as various segments and groupings within the industry. The study found that 2008 was a record setting year, outpacing 2007 in industry profits and revenue.

| A&D companies or divisions included in this study in sales revenue order |                                  |                           |                                |
|--|----------------------------------|---------------------------|--------------------------------|
| 1. EADS  | 18. SAIC                         | 35. SAAB Aerospace        | 52. Parker Hannifin*           |
| 2. Boeing  | 19. Goodrich                     | 36. DRS                   | 53. Vought Aircraft Industries |
| 3. Lockheed Martin   | 20. Embraer                      | 37. Babcock International | 54. GKN*                       |
| 4. Northrop Grumman  | 21. ITT Defense*                 | 38. IHI*                  | 55. Allegheny Technologies*    |
| 5. BAE Systems   | 22. Dassault Aviation            | 39. Zodiac Group          | 56. SRA International          |
| 6. General Dynamics  | 23. Harris                       | 40. QinetiQ               | 57. Esterline                  |
| 7. Raytheon  | 24. Rockwell Collins             | 41. Elbit Systems         | 58. AAR                        |
| 8. United Technologies*  | 25. Mitsubishi Heavy Industries* | 42. Rheinmetall*          | 59. Barnes Group               |
| 9. Finmeccanica  | 26. Alliant TechSystems          | 43. Cobham                | 60. Serco*                     |
| 10. GE Aviation*   | 27. Kawasaki Heavy Industries*   | 44. CACI                  | 61. Hexcel                     |
| 11. Thales   | 28. MTU Aero Engine              | 45. VT Group              | 62. CAE                        |
| 12. Rolls Royce  | 29. CSC*                         | 46. BE Aerospace          | 63. Orbital Sciences           |
| 13. L3 Communications  | 30. Spirit Aerosystems           | 47. Meggitt               | 64. Titanium Metals            |
| 14. Safran   | 31. Precision Castparts*         | 48. BBA Aviation          | 65. Triumph Group              |
| 15. Textron  | 32. Singapore Technologies       | 49. Teledyne Tech         | 66. Moog*                      |
| 16. Honeywell Aerospace*   | 33. Hawker Beechcraft            | 50. Oshkosh Truck*        | 67. Smiths Group*              |
| 17. Bombardier*  | 34. URS*                         | 51. Mantech               |                                |

\* Partial company results, based on business unit A&D activity. See methodology section

**Summary financial metrics:** Sales revenue for the global industry likely reached a record level in 2008 and increased 7.9% from \$552 billion to \$595 billion. EADS, the multi-country European aerospace company formed in 2000 from legacy aerospace and defense companies, edged out Boeing as the world's largest A&D firm. The global industry's operating earnings increased 9.5% and reached a record \$54.2 billion, despite the negative impact of the Boeing labor strike, and the goodwill impairment at Northrop Grumman. Operating margin, a measure of income statement efficiency, improved from 8.97% to 9.11%, for a 13bps increase year over year, continuing a longer term trend of improving manufacturing and supply chain efficiency.

The global industry's return on invested capital (ROIC) decreased from 12.85% to 11.79% and their free cash flow (FCF) also decreased, from \$44.9 billion to \$36.9 billion, for a 17.7% decrease, principally due to the deteriorating condition of the overall market in the last quarter of 2008. Their book to bill (BTB) ratio, a key in determining future sales revenue health, decreased from 1.50x to 1.33x, for a 10.9% decrease, due to the same deteriorating conditions. Finally, after several years of gains that outpaced the standard equity indices, the combined share prices for the U.S. companies fell further than the S&P 500 benchmark, while the combined share prices for the European companies lagged the Dow Jones (DJ) Stoxx index despite a strong performance in the first half of the year.

The following table summarizes the key performance metrics for the industry. Each performance metric is described in more detail below.

| Metrics                               | 2008   | 2007   | Change<br>(2008 vs. 2007) |
|---------------------------------------|--------|--------|---------------------------|
| Revenue (\$B)                         | 595.30 | 551.83 | 7.88%                     |
| Operating earnings (\$B)              | 54.21  | 49.52  | 9.46%                     |
| Operating margin %                    | 9.11   | 8.97   | 1.47% (13 bps)            |
| ROIC %                                | 11.79  | 12.85  | -8.26% (-106 bps)         |
| Free cash flow (FCF) (\$B)            | 36.94  | 44.86  | -17.67%                   |
| Book-to-Bill (BTB%)                   | 1.33   | 1.50   | -10.88%                   |
| DJ A&D Index vs. S&P 500 (bps)        | -530   | 1640   | -2170                     |
| European A&D Index vs. DJ Stoxx (bps) | -170   | -4130  | 3960                      |

The following sections contain various analyses we conducted to compare and contrast the 2008 financial performance of the industry, based on type of company, geography and on a combined basis as follows:

- **2008 combined industry performance details**
- **Commercial and business aircraft**
- **Defense**
- **U.S. versus European companies**
- **OEM versus supplier**
- **Services focused companies**

## 2008 Combined industry performance details:

Our global A&D industry performance study was based on the 67 companies that recorded sales revenue of greater than \$1 billion in 2008. If companies had less than 60% of revenues derived from A&D activities, only that A&D portion of revenue was counted in our study. State owned enterprises as well as privately owned companies lacking adequate financial performance information were excluded from this study. Performance metrics assessed included sales revenue, operating earnings, operating margin, return on invested capital, free cash flow, the book to bill ratio and the changes in the equity markets.

The global A&D marketplace is highly concentrated, with the revenue for the top 10 companies in our study comprising 58.4% of the industry sales revenue. Thus the performance of these top 10 companies disproportionately impacts the performance of the industry as a whole. The discussion of each of these performance metrics is described below.

**Sales revenue:** Sales revenue for the global industry reached a record level in 2008 and increased \$43.5 billion, or 7.9% from \$551.8 billion to \$595.3 billion. Several companies experienced \$2+ billion revenue increases including EADS, Finmeccanica, Northrop Grumman, General Dynamics, United Technologies, GE Aviation, and ITT. Sales revenue growth at EADS, Finmeccanica, and GE Aviation, together, contributed 30% of the sales revenue growth in 2008 for the industry.

EADS, the multi-country European aerospace company with an initial public offering and formation in 2000, edged out Boeing as the world's largest A&D company in sales revenue. EADS recorded sales revenue of \$62.3 billion in 2008, up 10.6% over 2007. EADS' strong 2008 revenue performance is attributable to higher deliveries of commercial aircraft, helicopters, higher sales of commercial satellites, and revenue growth in its defense programs.

In addition, Finmeccanica's sales revenue grew by 12.0% to \$21.7 billion, primarily driven by higher volumes of its ATR regional aircraft, sales of aero-structures, and growth in manufacturing of satellites and delivery of satellite services. The DRS acquisition in October 2008 contributed approximately \$800 million to sales revenue in 2008. This acquisition will likely contribute to double digit sales revenue growth in 2009.

Boeing's sales revenue declined by 8.3% in 2008 to \$60.9 billion. The decline in Boeing revenue was primarily due to lower revenues at Boeing Commercial Airplanes (BCA), resulting from fewer deliveries following a work stoppage. The International Association of Machinists and Aerospace Workers (IAM) went on labor strike following the expiration of their collective bargaining agreement in 2008. Boeing delivered 104 fewer than expected airplanes due to this IAM labor strike. Overall, Boeing experienced a sales revenue decline of \$5.5 billion in 2008. Had this decline not occurred, the industry would have experienced 8.9% sales revenue growth, a 12% increase over the 7.9% industry growth cited earlier.

Other companies impacted the higher average industry increases in sales revenue. Lockheed Martin recorded revenue of \$42.7 billion in 2008, a rise of only 2.1%, versus the industry growth rate of 7.9%, largely due to fewer combat aircraft deliveries and decreased revenues from government and commercial satellite activities. Another company that significantly impacted the industry revenue growth rate is Dassault Aviation, where revenue fell by 8.6% in 2008 to \$5.4 billion, primarily due to a decline of 68.5% in its defense export sales. Also, revenue at its Falcon Jet division declined by 1.5% in 2008, due to order cancellations and postponements, and the negative impact of the used aircraft market, amidst a deteriorating economic environment.

**Operating earnings and margins:** Some of the most important indicators of financial performance are operating earnings and operating margin. Operating earnings for the industry increased 9.5% and broke through \$50 billion, likely for the first time ever, at \$54.2 billion in 2008. This occurred despite the negative impact of the Boeing labor strike, and the goodwill impairment at Northrop Grumman described earlier. Operating margin, a measure of income statement efficiency, for the industry improved from 8.97% to 9.11%, for a 13 bps increase, continuing a longer term trend of improving manufacturing and supply chain efficiency. Operating earnings and margin varied greatly depending on geography and type of business. Analysis was conducted to evaluate the performance amongst these groupings, which is included later in this study.

Lockheed Martin, EADS, Boeing, General Dynamics and GE Aviation each topped \$3 billion in operating earnings, with Lockheed Martin leading the way with \$5.1 billion in 2008. Together, these top earners contributed \$20.4 billion, or 37% of the earnings in 2008 of the industry.

As mentioned, Lockheed Martin's operating earnings stood at \$5.1 billion, for a 13.3% increase, principally due to higher earnings in all its business segments, except Aeronautics. In addition, Lockheed Martin's operating profit was favorably affected by lower corporate costs, higher equity earnings in affiliates, and the recognition of the deferred gain from the 2006 sale of its interest in Lockheed Khrunichev Energia International, Inc. (LKEI).

EADS's operating earnings improved from a loss of \$48 million in 2007 to \$4.0 billion in 2008, due to improved cost performance in most of its businesses and the Power8 productivity programs implemented as a group-wide initiative. The \$48 million loss in 2007 was primarily driven by EADS's provision of approximately \$1.7 billion owing to delays and cost overruns in its A400M and A350 XWB programs. Given the size and impact of EADS on industry profits in 2008 especially compared to 2007, this was a large contributor to the successful financial performance of the industry.

General Dynamics' operating earnings rose by 17.3% to \$3.7 billion in 2008. Growth in operating earnings exceeded the sales growth in all of the company's business segments owing to its strong program execution and focus on operating performance. As a result, General Dynamics recorded its highest operating margin since 2000.

Operating earnings at Boeing decreased by 32.2%, where BCA's operating earnings decreased by \$2.4 billion compared with the same period in 2007, primarily due to fewer new airplane deliveries resulting from the IAM strike, increased program infrastructure costs related to the strike, program delays in the 787 and 747-8 programs, and a charge taken on the 747-8 program. The \$2.4 billion decline in operating earnings at BCA were offset by approximately \$500 million of non-BCA activities, resulting in a decline of \$1.9 billion in operating earnings.

Northrop Grumman's operating earnings decreased by 104%. The company incurred a non-cash, after-tax charge of \$3.1 billion for impairment of goodwill at the Shipbuilding and Space Technology business units, caused by the effects of adverse equity market conditions.

BE Aerospace generated an operating loss of \$36.2 million in 2008 versus operating earnings of \$247.0 million in 2007. This resulted primarily from goodwill and intangible asset impairment charges of \$310.2 million recorded in its Consumables management segment in 2008.

The top 3 operating margin performers in the industry are worthy of note. Precision Castparts had the highest operating margin, at 21.3%, up from 17.2% in 2007. Rockwell Collins had the next highest operating margin at

20%, up from 19.1% in 2007. Ranking third was GE Aviation, with operating margins of 19.1%, down slightly from 19.2% in 2007. These companies are focused on engines and avionics, an increasingly important part of the aerospace value chain which can impact the direct operating costs of commercial and military aircraft.

**Return on invested capital:** In 2008, the industry ROIC decreased from 12.85% to 11.79%, a decrease of 8.3% (106 bps). Given the size of Boeing as a high weighting in the industry average, its performance impacts the ROIC average. In 2008, Boeing had a significantly positive impact on the industry average ROIC, as the company recorded an ROIC% of 49.6%, the highest among the companies under analysis. Excluding Boeing, the industry average ROIC would have been 7.5%, much lower than the industry ROIC of 11.8%.

Aside from Boeing, the combined performance of EADS, Lockheed Martin, and General Dynamics significantly contributed to the industry's average ROIC growth. In the absence of these companies, the industry would have recorded an ROIC of 14.0% in 2007 and 9.5% in 2008, a decline of 32.3% (452 bps), as compared to the industry decline of 8.3% (106 bps).

EADS recorded a 19.1% ROIC in 2008 versus a negative ROIC% of 4.6% in 2007. This significant improvement can be attributed primarily to a net income of \$2.3 billion, against a net loss of \$0.6 billion in 2007, mostly due to a provision of approximately \$1.7 billion relating to delays and cost overruns in its A400M and A350 XWB programs.

Lockheed Martin recorded a relatively high ROIC of 21.7% in 2008, as its net earnings increased by 6.1% and average debt decreased by 1.6%. In addition, General Dynamics also registered a relatively high ROIC of 18.5% in 2008, as the company's earnings from continuing operations went up by 19.1% to \$2.5 billion and it also repurchased 20 million outstanding shares worth \$1.5 billion in 2008.

Conversely, Northrop Grumman, Rolls Royce, and Finmeccanica negatively impacted the industry performance. The industry's ROIC performance in absence of these three companies would have been 13.3% in 2007 and 16.8% in 2008, a rise of 26.5% (353 bps) as compared to the industry average's decline of 8.3% (106 bps).

Northrop Grumman's negative ROIC of 12.6 % was primarily due to a net loss of \$1.3 billion in 2008 owing to the same impacts to operating earnings: a non-cash, after-tax charge of \$3.1 billion for impairment of goodwill at Shipbuilding and Space Technology business units mentioned above. In addition, the company incurred a pre-tax charge of \$326 million in 1Q08 because of delays in LHD-8 and other ship programs. In the absence of these charges, the company's 2008 operating margin would have been 9.7% (as opposed to -0.3%), compared to its 2007 operating margin of 9.5%.

Rolls Royce also recorded a negative ROIC of 94.9%, as the company incurred a net loss of \$2.3 billion, due to a significant increase in its net financing costs. Another company that negatively impacted the industry ROIC is Finmeccanica which experienced an ROIC of 4.7%, much lower than the industry average of 11.8%. Finmeccanica's ROIC was lower owing to a sluggish growth in its net earnings, as well as a significant increase of 87.9% in its total borrowings (current and long-term) in 2008.

As mentioned above, Boeing turned in the highest ROIC performance in 2008, at an historic high of 49.6%, up from 37.4% in 2007. Rockwell Collins had the next highest ROIC score at 31.4%, down slightly from 33% in 2007. Third highest ROIC performance in 2008 was Allegheny Technologies with 24.7%, down from 31.8% in 2007.

Generally speaking, these companies have been able to make their past acquisitions pay for themselves and more. In the case of Boeing, up until 2008, it was one of the only OEMs to impair goodwill and write-off portions of their prior acquisitions left on the books, resulting in higher ROIC scores, contributing to their already high ROIC performance. In the case of the other top 2 performers, their high ROIC performances also reflects the discipline in acquisitions, resulting in less relative amounts of goodwill being placed on their balance sheets upon closing, i.e., acquisition value being closer to book value.

Also of note, services companies do not dominate the top half of ROIC performers in the industry, as would be expected, due to the relative non-reliance on hard assets to be in that business. In fact SAIC and Mantech were the only firms to place in the top third of ROIC performers in 2008. As mentioned earlier, services businesses increasingly operate in a competitive pricing environment, particularly in government IT services, especially for pure play services firms. Also, services businesses have been increasingly acquisitive, resulting in more goodwill being placed on balance sheets, which makes it more difficult to bring a high return on that investment, especially in the immediate period after the acquisition closing.

**Free cash flow:** In 2008, industry free cash flow (FCF) decreased from \$44.9 billion to \$36.9 billion, a 17.7% decrease, principally due to the deteriorating condition of the overall A&D Industry market in the last quarter of 2008.

The three companies with the highest FCF levels accounted for 34.1% of industry FCF: United Technologies (\$4.9 billion), EADS (\$4.2 billion), and Lockheed Martin (\$3.5 billion). Overall, the top 10 companies in FCF accounted for 74.8% of industry FCF.

Raytheon, Rolls Royce, and Bombardier boosted the industry's average FCF substantially. In the absence of these companies, the industry would have recorded FCF of \$42.6 billion in 2007 and \$32.0 billion in 2008, a decrease of 24.8%.

Raytheon's FCF grew by 93.3% to \$1.7 billion, due to factors such as higher deferred income taxes and current assets. It is noteworthy that the company's 2007 FCF was lowered by \$885 million resulting from the sale of Raytheon Aircraft and Flight Options during 2007; this further widens the gap between the FCF performance in 2007 and 2008.

Rolls Royce generated a strong FCF of \$1.3 billion because of higher cash flow from operating activities and higher net financing income and payables. Bombardier registered a substantial increase in its FCF from \$610 million in 2007 to nearly \$2.0 billion in 2008. The company made long-term debt repayments of \$1.1 billion and discretionary pension fund contributions totaling \$384 million in 2008.

However, companies such as Boeing, BAE Systems, and Textron impacted the industry FCF performance negatively. The industry's FCF excluding these three companies would have been \$32.8 billion in 2007 and \$36.7 billion in 2008, a growth of 11.9%.

Boeing's FCF was approximately negative \$2 billion, compared to nearly \$8 billion positive FCF in 2007. Boeing's operating activities resulted in a \$401 million cash outflow in 2008, in contrast to cash surpluses of \$9.6 billion and \$7.5 billion in 2007 and 2006, respectively. The decline in 2008 was primarily attributable to higher working capital requirements. The increase in inventories was driven by continued spending on production materials, airplane engines, and supplier advances during the IAM strike, lower commercial airplane deliveries and the continued ramp-up of the 787 program.

Two other companies negatively impacted the industry average FCF. BAE Systems' FCF declined by 31.4% to \$2.1 billion in 2008. The company's interest and preference dividends increased by around 50%, reflecting the cost of acquisitions such as MTC, Tenix Defence and Detica acquired in 2008. BAE's capital expenditure also doubled in 2008, because of its new residential and office facilities in Saudi Arabia. In addition, Textron's FCF fell by 69.9% to \$200 million in 2008, owing to various factors such as lower net income, increase in inventories, and increased capital expenditure related to its Cessna and Bell business segments.

**Book to bill ratio:** The industry's BTB ratio is a key indicator in determining future sales revenue health. In 2008, the industry performance decreased from 1.50x to 1.33x, for a 10.9% decrease. The industry has experienced significant back to back years of sales booking, 50% in 2007 and 33% in 2008, adding healthy backlog entering the current uncertain economic period. Three companies that boosted the industry BTB ratio markedly were Northrop Grumman, Lockheed Martin, and General Dynamics. Excluding these three companies, the industry would have had a BTB ratio of 1.59x in 2007 and 1.31x in 2008, a fall of 17.6%.

Northrop Grumman's BTB ratio rose from 1.08x in 2007 to 1.42x in 2008, up by 31.5% primarily due to higher backlogs in its Aerospace and Shipbuilding divisions. Some of the significant new awards 2008 include \$5.6 billion for the Virginia-class Block III submarine programs, \$5.1 billion for the Gerald R. Ford (CVN 78) aircraft carrier, \$1.4 billion for the DDG 1000 Zumwalt class destroyer, \$1.2 billion for the BAMS Unmanned Aircraft System program, and various classified programs.

Lockheed Martin's BTB ratio also increased from 1.02x in 2007 to 1.10x in 2008, an increase of 8.0%. All of Lockheed Martin's businesses, especially IS&GS (Information Systems & Global Services), recorded higher backlogs. Finally, General Dynamics' BTB ratio increased from 1.12x in 2007 to 1.93x in 2008, a growth of 73.1%. This rise in General Dynamic's BTB ratio is largely due to its Aerospace and Marine segments where backlogs approximately doubled. The Aerospace segments received orders for Gulfstream aircraft as well as future aircraft maintenance and support services. Some contracts in the Marine segment's backlog include \$14.5 billion for the Virginia-class submarine program and \$1.6 billion for the Navy's T-AKE combat-logistics ship program.

On the other hand, companies such as United Technologies, Dassault Aviation, Kawasaki Industries, and Hawker Beechcraft impacted the industry performance negatively. The industry's BTB ratio excluding these companies

would have been 1.50x in 2007 and 1.36x in 2008, a decrease of 9.6%--less of a decline than the 10.9% drop in industry BTB ratio.

United Technologies' BTB ratio fell from 1.22x in 2007 to 1.04x in 2008, a decrease of 14.8%. This decline can be attributed to lower additions to backlogs in its Pratt & Whitney business units in 2008, among other factors. The company's backlog growth slowed to 4% in 2008 compared to a significant growth of 30% in 2007. Dassault Aviation sales bookings and orders decreased 7% as compared to 2007, particularly due to lower Falcon aircraft orders; 115 new Falcons were ordered in 2008, compared to 212 in 2007.

Kawasaki Heavy Industries' BTB ratio decreased from 1.02 in 2007 to 0.98 in 2008, a decrease of 3.7%. The company recorded a sluggish backlog growth of 4.6% in 2008 against a robust backlog growth of 11.8% in 2007, due to lower orders in some of its segments such as Rolling Stock & Construction Machinery, Aerospace, and Plant & Infrastructure Engineering. Also, Hawker Beechcraft's BTB ratio fell from 2.77x in 2007 to 0.26x in 2008, a decrease of 90.6%, because of a \$2.6 billion fall in backlog stemming from a significant decrease in sales orders in 2008. As the economic environment deteriorated, new order activity for Hawker Beechcraft declined and order cancellations increased.

**Equity markets:** Finally, after several years of gains that outpaced the standard equity indices, the combined share prices of the US companies in the study fell further than these indices, while the share prices of the European companies in the study lagged the DJ Stoxx index despite a strong performance in the first half of the year.

After several years of double digit share price appreciation, in 2008 the DJ A&D index underperformed the S&P 500 index by 530 basis points, the first time in almost a decade. However, from YE2004 through YE2007, the DJ A&D index appreciated 79.4%, while the broader S&P 500 index appreciated only 21%. However, by YE2008, 3 years of gains in the DJ A&D index had all been given back for a 1.1% 4 year gain, while the S&P 500 depreciated 25.3% over the same 4 year period, demonstrating the resiliency of the A&D business.

However, in the first half of 2008, the S&P 500 declined by 12.5% while the DJ A&D index declined by 23.1%. In the second half of 2008, the S&P500 declined by 29.5% while the DJ A&D index declined by 26.7%. The DJ A&D index's underperformance relative to the S&P in 2008 took place largely in the first half of the year.

Boeing stock declined by 51.2% in 2008, clearly a major contributor to the DJ A&D index's underperformance. The following chart illustrates share price performance of the industry composite index relative to the broader S&P 500 index over the last few years.

| Share price performance | 2008   | 2007  | 2006  | 2005  | 04 to 08 | 04 to 07 | 1H 2008 | 2H 2008 |
|-------------------------|--------|-------|-------|-------|----------|----------|---------|---------|
| DJ A&D Index            | -43.6% | 19.6% | 24.4% | 20.6% | 1.1%     | 79.4%    | -23.1%  | -26.7%  |
| S&P 500 Index           | -38.3% | 3.2%  | 13.7% | 3.0%  | -25.3%   | 21.0%    | -12.5%  | -29.5%  |
| Basis point difference  | -530   | 1640  | 1070  | 1760  | 2640     | 5840     | -1060   | 280     |

Despite outperforming the larger DJ Stoxx index in 2005 and 2006, the European A&D index posted relatively weak performance in 2007 and 2008, dragged down by EADS' loss of about half its market value over that period. Between 2004 and 2008, the European A&D index underperformed the larger index by 4870 basis points. Still, the European A&D index lagged the DJ Stoxx index by only 170 basis points in 2008, thanks to a strong performance in the first half of the year.

| Share price performance | 2008   | 2007   | 2006  | 2005  | 04 to 08 | 04 to 07 | 1H 2008 | 2H 2008 |
|-------------------------|--------|--------|-------|-------|----------|----------|---------|---------|
| European A&D Index      | -44.9% | -38.2% | 21.8% | 50.9% | -37.5%   | 13.5%    | 16.3%   | -52.6%  |
| DJ Stoxx index          | -43.2% | 3.1%   | 4.3%  | 50.8% | -7.9%    | 62.2%    | -25.2%  | -24.1%  |
| Basis point difference  | -170   | -4130  | 1750  | 10    | -2960    | -4870    | 4150    | -2850   |

## Commercial and business aircraft:

Over the last five years, the commercial aircraft sub sector has enjoyed relative success in building backlog due to the resurgence in commercial airline market growth, the introduction of innovative new fuel efficient aircraft, and financial growth in key markets in the Middle East and Asia Pacific. The success was shared not only by the large commercial jet producers, but by the regional and business jet manufacturers, as well, generally resulting in record backlogs.

However, record oil prices in mid 2008, followed by the global recession, have impacted revenue passenger mile (RPM) growth for the industry, a key determinant of aircraft orders. This impact plus the resulting credit crisis has put this sub-sector of the industry under pressure of order cancellations or deferrals, due to challenges to finance aircraft or cash flow difficulties in airline operations. The business jet sub segment of the industry was hit especially hard as orders were cancelled due to inability to finance sales and because of the negative press about the use of private jets for business executives.

## Defense:

Additionally, the defense sub sector has experienced significant growth, especially in the U.S. In the eight years of the Bush administration, defense outlays have grown from \$305 billion in FY2001 to \$612.5 billion through mid year, plus another \$75.5 billion proposed for the remainder, in the 2009 fiscal budget, inclusive of the Global War of Terror (GWOT) supplemental budgets. Transition from internal R&D spend to full scale production on fixed price contracts has contributed to industry earnings at a greater rate than in the past. Generally, these companies have also used superior cash flow generation from the last four years to pay down debt, increase dividend payments, and buy back shares, contributing to greater financial performance.

The global defense spend is approximately 50% U.S., and European defense firms have increasingly generated revenues derived from the U.S., particularly for BAE Systems, Finmeccanica and Rolls Royce, who have presence as U.S. Department of Defense (DoD) contractors.

Additionally, the defense sub sector has improved revenue growth from non U.S. DoD sources, with increasing sales of defense systems internationally, particularly to the Middle East. Finally, many defense firms have made gap filling acquisitions and built internal capabilities in the last several years in IT systems integration, aftermarket parts and services, as well as managed services.

## U.S. versus European companies:

Industry sales revenue is predominantly U.S., with 60%, or \$358.6 billion of 2008 sales being generated by companies in the U.S. geography. European sales revenue was 34% of the industry revenue at \$201.5 billion. Japanese, Singaporean, Israeli, Canadian and Brazilian firms represented the remainder of the industry.

Total sales revenue for U.S. companies grew 6.3% in 2008, while the European companies grew faster, at 9.6%. Key factors impacting these results lies with the performance of the largest companies, given their relative size. Boeing's revenue declined by 8.3%, following the work stoppage which negatively impacted the industry performance as Boeing alone contributes 17% to the revenue for U.S. companies. Lockheed Martin, another leading revenue contributor, also recorded a small increase of 2.1 % in 2008 revenue. However, EADS and Finmeccanica, two companies that are significant contributors to the European results, registered a growth of 10.6% and 12% respectively in their 2008 revenue.

Regarding operating earnings, for the U.S. companies, performance fell by 4.5% and operating margin fell by 115 bps. However, the operating earnings for the European companies increased by an astounding 59.8% and their operating margin was also higher by 237 bps. Boeing and Northrop Grumman had a negative impact on the operating earnings and operating margin percentage for the U.S. companies, as described above. On the other hand, the European companies benefited from a rebound from poor financial performance in 2007.

The strong 2008 performance of EADS and BAE Systems accounted for the majority of the strong performance indicated for the European companies. EADS's operating earnings improved from a loss of \$48 million in 2007 to \$4.0 billion in 2008, thanks to improved cost performance in most of its businesses and productivity measures. In addition, BAE Systems' operating earnings also increased by 46% to \$3.0 billion, primarily because of earnings

from its ex-Armor Holdings business and the exchange translation related to U.S. dollar-denominated businesses. Regarding operating margin, U.S. companies averaged 10.2%, while European companies experienced 7.6%

Regarding ROIC, the U.S. companies experienced higher ROIC% of 17.32% in 2008, compared to the European companies at 2.99% in 2008, due to higher profitability and other factors. Boeing recorded an ROIC of 49.6%, and had a significant positive impact on the average ROIC for the U.S. companies. Rolls Royce and Finmeccanica are companies that pulled down the average ROIC% for the European companies. Rolls Royce recorded a negative ROIC of -94.9%, as the company incurred a net loss of \$2.3 billion, due to a significant increase in its net financing costs. Finmeccanica generated an ROIC of 4.7%, owing to a sluggish growth in its net earnings and a significant increase of 87.9% in its total borrowings (current and long-term) in 2008.

European companies in particular have had difficulty in rationalizing their property, plant and equipment by closing facilities and integrating acquisitions in an ROIC accretive manner. European labor unions and governments have insisted in many cases that jobs are to be protected. In some cases, due to national interests, duplicate final assembly facilities are operated in the interests of spreading aerospace jobs around, in exchange for national purchases of the affected products in offset agreements. These characteristics put downward pressures on the ROIC performance of the European companies, due to the relative inefficient utilization of assets, compared to U.S. companies.

Regarding cash flow, for the U.S. companies, FCF fell by 26.60%. For the European companies, FCF also declined by 9.68%, indicating better performance than the U.S. companies. FCF for the U.S. companies was impacted by Boeing and Textron significantly, as described above. The major negative influencer to the FCF performance for the European companies was BAE Systems.

Regarding sales bookings, the BTB for the U.S. companies ratio fell by 8.29%, while the European companies recorded a steeper decline of 16.82%. U.S. companies that pulled down the performance were United Technologies and Hawker Beechcraft. United Technologies' BTB ratio fell from 1.22x in 2007 to 1.04x in 2008, a decrease of 14.8%. This decline can be attributed to lower additions to backlogs in its Pratt & Whitney business units in 2008, among other factors. Hawker Beechcraft's BTB ratio fell from 2.77x in 2007 to 0.26x in 2008, a decrease of 90.6%, because of a \$2.6 billion fall in backlog stemming from a severe falloff in sales orders. One significant downward pull to the BTB for the European companies was Dassault Aviation. The company recorded consolidated orders 7% down as compared to 2007, particularly due to lower Falcon aircraft orders

## OEM versus suppliers:

The total revenue of OEMs increased by a moderate 5.51%, against the industry growth of 7.88%. For reasons cited previously, Boeing and Lockheed Martin pulled down the industry's OEM sales revenue performance in 2008. Suppliers outpaced OEMs in revenue growth in 2008. Revenue growth for suppliers were as follows: Tier 1: 9.1%, Tier 2: 13.9%, Defense electronics: 10.5%, Aero-structures: 6.3% and Services: 21%.

Regarding operating earnings, OEMs increased by a moderate 4.54%, against the industry growth of 9.46%. Their operating margin fell by 7 bps; however the industry's operating margin rose by 13 bps. Northrop Grumman recorded the steepest fall in its operating earnings among all OEM players as indicated above. OEMs with operating margins of 7.72%, were outperformed by suppliers as follows: Tier 1: 12.25%, Tier 2: 13.60%, Defense electronics: 11.26%, and Services: 7.26%. Aero- structures with operating margins of 6.24% did less well against OEMs in 2008.

Regarding ROIC, OEMs averaged an increase of 389 bps in 2008, outpacing the industry's ROIC which decreased by 106 bps. A big driver for OEM ROIC was the asset effectiveness of EADS and Boeing that recorded high ROIC values of 19.1% and 49.6% respectively. Of the top 8 ROIC performers, half were OEMs, with sales revenue averaging \$49 billion. Generally these companies have made scale economies work for them, concentrating on efficient and fuller utilization of assets, as well as the points raised above. However this observation should be viewed with caution, as another interesting note is that of the bottom 11 performers, 5 are OEMs as well, reflecting a bimodal distribution of ROIC performance in 2008. Upon closer reflection, there are specific and different reasons for poor ROIC performance at the company level, having to do with impairment charges, program performance challenges, or unique circumstances that affect ROIC performance.

Regarding cash flow, OEMs total FCF in 2008 was \$17.5 billion, which was 33.83% lower than in 2007, as compared to the industry's FCF which decreased by 17.67%. Lower FCF for OEMs could be largely attributed to Boeing, BAE Systems, and Textron. Boeing's FCF was approximately negative \$2 billion, compared to nearly \$8

billion positive FCF in 2007, resulting from higher working capital requirements. BAE Systems' FCF also declined by 31.4% to \$2.1 billion in 2008. In addition, Textron's FCF fell by 69.9% to \$200 million in 2008. Suppliers FCF did not suffer as badly as follows: Tier 1, increase of 4.73%, Tier 2, an increase of 24.45%, Defense electronics, an increase of 35.3%, and Aero-structures, an increase of 98.88%. Services businesses did not fare as well, with negative 24.45% FCF growth.

Regarding sales bookings, OEMs average BTB fell by 9.13%, slightly better than the industry's decline of 10.88%. Two OEMs that boosted the industry BTB ratio markedly are Northrop Grumman and Lockheed Martin. Suppliers had mixed performance compared to OEMs in the BTB ratio.

## Services focused companies:

Traditional views of A&D companies are that they design and manufacture hardware and military weapons that can be seen. Increasingly, A&D industry technology contains more "software" that cannot be seen. Services focused companies are becoming increasingly a part of the A&D value chain as software and other services are purchased by commercial and military customers.

As evidence of this trend, in 2008 the total revenue of Services firms grew by a high rate of 20.79%, compared to the industry growth rate of 7.88%. Companies that substantially added to the growth uptrend in 2008 are SAIC, URS, and Babcock International.

However, when assessing the profitability of Services, it appears that the operating margins in 2008 at 7.26% are lower than the industry average as well as other non-OEM suppliers, except Aero-structures. Also of note, companies with operating margins in the bottom half of the industry, 35% of these companies were in the services business – indeed only 2 services business ranked in the top half of the industry in operating margin performance. This reflects the increasingly competitive pricing environment, especially in the government IT contracting business. Many OEMs have diversified into the government IT services business, and have used this to their advantage due to scale economies as well as strategic adjacency with their other businesses. Pure play services firms did not fare as well in operating margin performance due to the difficulty to differentiate and command premium pricing.

The following chart compares and contrasts the growth rates for each of the key performance metrics used in this study.

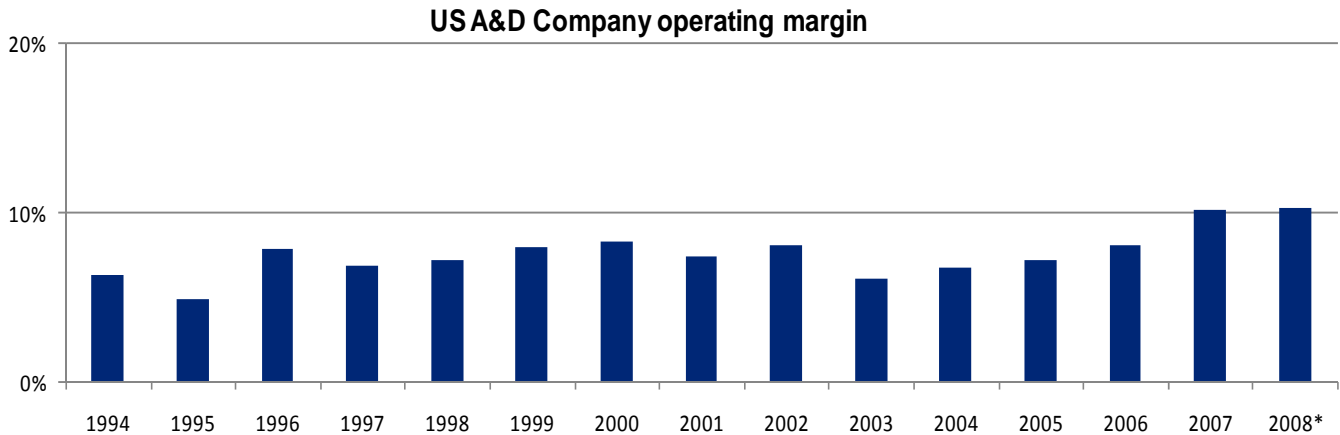
| Industry performance 2008 growth                                     |                |                           |                         |                      |            |            |
|--|----------------|---------------------------|-------------------------|----------------------|------------|------------|
|  | Revenue growth | Operating earnings growth | Operating margin growth | ROIC% growth         | FCF growth | BTB growth |
| Industry   | 7.88%          | 9.46%                     | 1.47%<br>(13 bps)       | -8.26%<br>(-106 bps) | -17.67%    | -10.88%    |
| U.S.   | 6.30%          | -4.54%                    | -116 bps                | -56 bps              | -26.60%    | -8.29%     |
| Europe 1<br>(differential conversion rate)                           | 9.56%          | 59.84%                    | 238 bps                 | -189 bps             | -9.68%     | -16.82%    |
| Europe 2 (constant conversion rate)                                  | 11.38%         | 67.93%                    | 257 bps                 | -150 bps             | -6.76%     | -18.18%    |
| OEM  | 5.51%          | 4.54%                     | -7 bps                  | 389 bps              | -33.83%    | -9.13%     |
| Tier 1   | 9.06%          | 20.97%                    | 121 bps                 | -1320 bps            | 4.73%      | -18.71%    |
| Tier 2   | 13.85%         | -7.98%                    | -323 bps                | -500 bps             | 24.45%     | -3.25%     |
| Defense electronics  | 10.53%         | 12.30%                    | 18 bps                  | 88 bps               | 35.30%     | 0.60%      |
| Aero-structures  | 6.25%          | -4.83%                    | -73 bps                 | -122 bps             | 98.88%     | -14.77%    |
| Services   | 20.79%         | 12.75%                    | -52 bps                 | -221 bps             | -24.45%    | -6.63%     |
| * Growth represents the difference between 2007 and 2008 performance |                |                           |                         |                      |            |            |

The following chart further illustrates the absolute level of financial performance for the industry, with types of businesses and geography identified.

| <b>Industry performance 2008</b> |                         |                                       |                      |        |                     |           |
|----------------------------------|-------------------------|---------------------------------------|----------------------|--------|---------------------|-----------|
|                                  | Revenue<br>(\$ million) | Operating<br>earnings<br>(\$ million) | Operating<br>margin% | ROIC%  | FCF<br>(\$ million) | BTB ratio |
| Industry                         | \$595,296               | \$54,208                              | 9.11%                | 11.79% | \$36,936            | 1.33      |
| U.S.                             | \$358,571               | \$36,468                              | 10.17%               | 17.32% | \$23,402            | 1.24      |
| Europe                           | \$201,532               | \$15,224                              | 7.55%                | 2.99%  | \$11,096            | 1.51      |
| OEM                              | \$337,296               | \$26,035                              | 7.72%                | 18.28% | \$17,497            | 1.57      |
| Tier 1                           | \$134,518               | \$16,480                              | 12.25%               | -1.04% | \$11,417            | 1.06      |
| Tier 2                           | \$15,377                | \$2,091                               | 13.60%               | 11.85% | \$2,545             | 0.90      |
| Defense electronics              | \$48,574                | \$5,469                               | 11.26%               | 9.97%  | \$3,536             | 1.11      |
| Aero-structures                  | \$18,345                | \$1,144                               | 6.24%                | -1.26% | \$(25)              | 0.89      |
| Services                         | \$41,185                | \$2,989                               | 7.26%                | 8.46%  | \$2,188             | 0.89      |

# Summary observations on 2008 performance of the industry

Clearly, 2008 was a record setting year for financial performance by the global A&D industry, even though it was impacted by the work stoppages and the global credit crisis later in the year. Although not directly comparable, the broader A&D Industry profitability as calculated in past AIA studies of the entire U.S. A&D Industry, as shown in the following chart, illustrates that 2007 had the highest operating earnings during that time period.



Source: AIA study

\*Not comparable to this Deloitte global industry study.

After several increasingly successful years of financial performance, the global industry surpassed the revenue, operating earnings and operating margin performance of the industry in 2007. Their revenue increased by 7.9% to \$595 billion. Industry operating earnings jumped 9.5% to \$54.2 billion while operating margins increased by 1.5% (13 bps) to 9.11%. Their financial performance varied depending on subsector and region specific factors that impacted key metrics. This study highlights key findings in 2008 for the industry as follows:

- EADS edged out Boeing as the largest A&D company in terms of revenue
- Two specific factors impacted the industry, preventing an even higher level of performance: the strike at Boeing Commercial Airplanes and the non-cash goodwill impairment charge at year end for Northrop Grumman related to adverse conditions in the equity markets.
- European companies grew significantly faster at 9.56%, than U.S. companies at 6.3%, led by EADS's \$ 5.96 billion revenue growth in 2008.
- Operating margins for U.S. companies of 10.17% was higher than operating margins of 7.55% for European companies, a reflection of the long term difficulty in cutting labor costs and rationalizing facilities in countries where there is higher government intervention and job protection schemes
- Tier 1 and defense electronics suppliers significantly surpassed OEMs with higher revenue growth and operating margin performance
- Service companies had higher revenue growth, compared with the industry, but lagged in profitability, reflecting the competitive market in which it operates

The resurgence of commercial aircraft and business jet sales, the global war on terror, continued productivity improvements in cost structure, substitution of technology for labor in product development and manufacturing, and transformation of the supply chain from vertical integration to the super-supplier model, have all contributed to the success enjoyed by the industry over the last several years. These factors, plus the retirement of debt and share buybacks that many companies executed in this business cycle, have resulted in an A&D Industry that is well braced for the current economic downturn.

However, the industry is experiencing a significant challenge with aircraft order deferrals, the global credit crisis, potential cutbacks in large weapons programs, and a likely transformation in the defense acquisition process.

The A&D Industry's success in 2009 will largely depend on: a) successful continuance of current large scale programs under contract, and backlog protection mitigation actions, b) successful business development efforts globally, in particular the Middle East and India, c) effective management of cost and schedule targets while achieving mission assurance for the customer, d) how they execute strategic leverage in the acquisition space, and, e) the nimbleness with which they can identify and capture technology directions, and funding for emerging defense and security priorities.

# Study methodology

This analysis is based on the key financial performance metrics for 67 global A&D public companies which generated revenue greater than \$1 billion in 2008. By using the data from respective companies' 10-Ks or Annual reports into the calculation framework, we analyzed the industry's performance in 2008 and highlighted specific companies that had positive or negative impact on the industry's performance. We also analyzed categorical performance on the basis of business types and geographical identification.

Certain companies, with revenues ranging from \$153 million to \$3.75 billion, were excluded either because they failed to exceed the \$1 billion threshold, were private or State-owned, or were companies for which adequately reliable and sufficient data were not available. The cumulative 2008 revenue of those excluded companies was \$29.9 billion.

All data in this study are presented in \$US currency. Approximately 40% of the companies under analysis in this study are headquartered in countries other than the United States. For such companies, we applied a dual foreign currency conversion method to calculate industry aggregate figures in US\$. On the one hand, we applied the appropriate fiscal year-end conversion rate to a non-US company's "static" data such as shareholder equity, debt, backlogs etc... On the other hand, for "flow" data such as revenue, income, etc..., we applied a conversion rate that represented the average of each non-US company's respective starting fiscal year and ending fiscal year conversion rates. Where we explicitly state the growth rate of or absolute change in a non-US company's "flow" data such as revenue, we state such growth rate or absolute change in real terms, based on home currency data values, so as to minimize the impact of currency conversions.

## 1. Industry revenue:

- To calculate industry revenue for an individual company, it was necessary to determine the percentage of revenue associated with A&D activities. In calculating such percentage, we first checked to see whether the company explicitly stated an A&D revenue figure. In such a case, we used that explicitly stated percentage directly. If such percentage was not explicitly stated, we analyzed the company's various business segments and considered those which were related to A&D in estimating its industry revenue percentage.
- Once we assigned industry revenue percentages to all companies, we put them into two categories: those companies that derived **less than 60%** of their respective revenue from A&D and those companies that derived **equal to or more than 60%** of their respective revenue from A&D. If a company derived **less than 60%** of its revenue from A&D, we took only the revenue generated by the A&D part. However, if the company derived **equal to or more than 60%** of its revenue from A&D, we used total revenue for the company.
- In determining industry revenue, we calculated a summation of the industry revenue of all constituent 67 companies.

## 2. Operating earnings/margin:

- In calculating industry operating earnings, we took a two pronged approach (same as above), which states that if a company derived **less than 60%** of its revenue from A&D, we took only the operating earnings clearly associated with the A&D part. However, if the company derived **equal to or more than 60%** of its revenue from A&D, we took the total operating earnings for the company.
- In the cases of United Technologies, Precision Cast Parts, URS, Serco, Allegheny Technologies, MOOG, and CSC (all these companies derive less than 60% of their respective revenues from A&D), it was not possible to clearly assign operating earnings to the A&D part. In these cases, we derived the companies' respective A&D operating earnings by multiplying the companies' respective A&D revenue by the companies' respective total operating margin percentages.
- Operating earnings for the industry is a summation of operating earnings of all constituent companies.
- The companies' respective industry operating margins were calculated by dividing their respective A&D operating earnings by their respective A&D revenues.
- Operating margin for the industry was calculated as: total industry operating earnings as a percentage of total industry revenue.

### 3. Return on invested capital (ROIC)

- ROIC was considered for the entire company, as companies report it at the company level and not at the segmental level.
- We took the ROIC value as stated, if reported by the company. Lockheed Martin, General Dynamics, Raytheon, GE, and Babcock International published their ROIC values and the same were incorporated into the study. GE states its ROIC excluding GECS (General Electric Capital Services). We took GE's ROIC excluding GECS, as inclusion of GECS would have had a distorting effect on GE's ROIC performance.
- If the ROIC value was not published by the company, it was calculated as:  
$$\text{ROIC} = (\text{Net income from continuing operations} - \text{Dividends paid}) / (\text{Shareholder Equity} + \text{Net Financial Debt})$$
- All the components in the ROIC calculation were reflective of the entire company.
- Net Financial Debt: If the Net Financial Debt value was published by the company, we included it as stated, as in cases of United Technologies, ITT, Hawker Beechcraft, Safran, Serco, and BBA Aviation.
- If Net Financial Debt is not explicitly stated, it was calculated as:  
$$\text{Net Financial Debt} = \text{Short Term Debt} + \text{Long Term Debt} - (\text{Cash \& Cash Equivalents})$$

Both Short Term Debt and Long Term Debt were taken from the Balance Sheets and Cash & Cash Equivalents was taken from the Cash Flow Statements of the companies.
- ROIC for the industry is a revenue - weighted average. It was calculated as:  
$$\sum (\text{Company ROIC} * \text{Company revenue}) / \text{Total Industry Revenue}$$
- ROIC (Return on invested capital) stated in the study differs from ROCE (Return on capital employed). Some companies—such as Rolls Royce, Embraer, MTU Aero engines, SAAB, and Reinmettal—publish their ROCE%. Despite this fact, for purposes of this study, we calculated these companies' ROIC%. A company's ROCE% should not be compared with its ROIC%.
- ROIC was calculated based on component values in home currencies to minimize the impact of currency conversion.

### 4. Free cash flow (FCF):

- Free cash flow was calculated for the entire company, as it is impractical to allocate cash flows to a company's A&D and non A&D segments.
- If the FCF value was published by the company, we used it directly as in the cases of Northrop Grumman, ITT, DRS, Bombardier, EADS, Serco, and BBA Aviation.
- If the FCF value was not published by the company, it was calculated as:  
$$\text{FCF} = \text{Operating Cash Flow} - \text{Capital Expenditures}$$
- We calculated the Industry FCF as a summation of the FCFs of all constituent companies.
- The FCF of GE and Dassault Aviation were not included in calculating the Industry FCF. Inclusion of GE would have had a distorting effect on the calculation of Industry FCF. Dassault Aviation FCF was not included for lack of data.

### 5. Book-to-bill ratio (BTB):

- We took the BTB ratio as stated, if reported by the company. Bombardier, Qinetiq, and BE Aerospace published their BTB ratios and the same were incorporated in the study.
- If the BTB ratio was not published by the company, it was calculated as follows:  
$$(\text{Change in backlog between current fiscal year and previous fiscal year} / \text{revenue for current fiscal year}) + 1$$

- In calculating BTB ratio, we used a two-pronged approach which states that if a company derived **less** than 60% of its revenue from A&D, we took the backlogs and revenues of the A&D part. However, if the company derived **equal to or more** than 60% of its revenue from A&D, we took backlogs and revenues for the entire company.
- There were cases in which the company derived **less** than 60% of its revenue from A&D, but we based our calculation of BTB ratio on backlog and revenue for the entire company. Such was made necessary for the lack of A&D segmental information. These exceptions are: Precision Cast Parts, United Technologies, GE Aviation, Honeywell, Serco, and MOOG.
- The BTB ratio for the industry is a revenue weighted average. It was calculated as:  

$$\frac{\sum (\text{Company BTB} \times \text{Company revenue})}{\text{total industry revenue}}$$
- BTB ratio was calculated based on component values as reported in home currencies to minimize the impact of currency conversion.
- BTB ratios for services firms such as CSC, Cobham, BBA Aviation were not included in the calculation of the industry BTB ratio for lack of component backlog data. The BTB of certain other companies could not be calculated for lack of backlog data. These companies were Safran, Mitsubishi, URS, Zodiac, GKN, Allegheny Technologies, Hexcel, MOOG, and Smiths Group.

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