Aerospace & Defence
2011 year in review and 2012 forecast

We look at how aerospace and defence companies perform today—and what challenges and opportunities they will face tomorrow.

pwc

Contents

Methodology

Our data is based on the fiscal 2011 results for the largest 100 aerospace and defence companies, by revenue, with publicly available financial reports. Our cut-off for publication was March 31, 2012. Accordingly, a few companies were omitted because they had not reported results by the cut-off.

A&D companies include those that generate the majority of revenue from aerospace and defence activities, or for diversified companies, those reportable segments that derive a majority of revenue from aerospace and defence activities. The results are reported in U.S. dollars. Foreign currencies were translated at average exchange rates for the years ended December 31, 2011 and 2010, respectively.

Our report also expresses PwC's point of view on topics affecting the industry. Our viewpoints have been developed based on our interactions with our clients and other industry leaders and analysts.

Summary table

US$ billions	2011	2010	Change
Revenue	$677	$648	5%
Operating profit	$60.0	$59.1	2%
Operating margin	8.86%	9.13%	-27 bps

Source: PwC

Aerospace and defence industry delivers a second consecutive year of record revenues and profits

Our research indicates that the aerospace and defence (A&D) industry reported its best year ever in 2011 in terms of revenue and profit on the strength of a surging commercial aviation market that more than offset a soft defence performance. The industry had to overcome a nearly $5 billion decline in the operating profit of Finmeccanica to achieve the record profit results. For 2011 the top 100 A&D companies reported $677 billion in revenue and $60.0 billion in operating profit, setting records. Revenue was higher by 5% compared with 2010, while operating profit was up 2% over 2010. Operating margin dropped 27 basis points to 8.86%.

The mood in commercial aerospace is described by industry leaders as optimistic. Air traffic is strong and steady, driving the lucrative aftermarket business; the industry delivered a record number of large aircraft and the orders continue, driving record backlog—more than eight years—at current production rates. Times are so good, some people are asking whether there's a bubble. While there are risks, particularly the availability of aircraft financing, we believe it *is* real. Recent volatility in oil prices threatens to derail near-term economic growth; however, forecasted demand is based on reasonable assumptions about long-term economic growth and demographics. More importantly, backlogs provide a significant cushion between demand and current production rates that could absorb any reasonably anticipated softening in demand.

The mood in defence might be described as pensive due largely to the uncertainty over the prospect of sequestration in the United States. While the industry is prepared to absorb projected U.S. budget cuts of about $500 billion over the next decade, the situation could become significantly more challenging if sequestration is not averted, which would trigger automatic cuts to defence spending. While many believe such cuts could result in unacceptable risks to national security, it is difficult to predict how the political process will evolve, especially in a presidential election year.

Defence companies face more pressure than ever to improve productivity, increase transparency, respond to increasingly complex government regulations and oversight, tighter schedules, and generally higher expectations. Persistent security threats, the Iranian nuclear threat, and geopolitical instability, as witnessed recently in the Middle East, underscore the need for global security and could rapidly change defence priorities.

During the past decade, the A&D industry has demonstrated a more disciplined management approach through economic cycles, which has resulted in steady revenue and earnings growth and culminated in back-to-back record years of revenues and profit.

Largest increase in revenue (dollars)	EADS	$7,729M
Largest increase in revenue (percentage)	Triumph Group	124%
Largest increase in profit (dollars)	Thales	$1,282M
Largest increase in profit (percentage)	Thales	471%
Highest operating margin	Transdigm	40.4%

Largest increase in top 100 list

Triumph Group increased 26 spots from #69 to #43

Largest decrease in revenue (dollars)	Oshkosh Defense	-$2,797M
Largest decrease in revenue (percentage)	Oshkosh Defense	-39%
Largest decrease in profit (dollars)	Finmeccanica	-4,949M
Largest decrease in profit (percentage)	Finmeccanica	-303%

Largest decrease in top 100 list

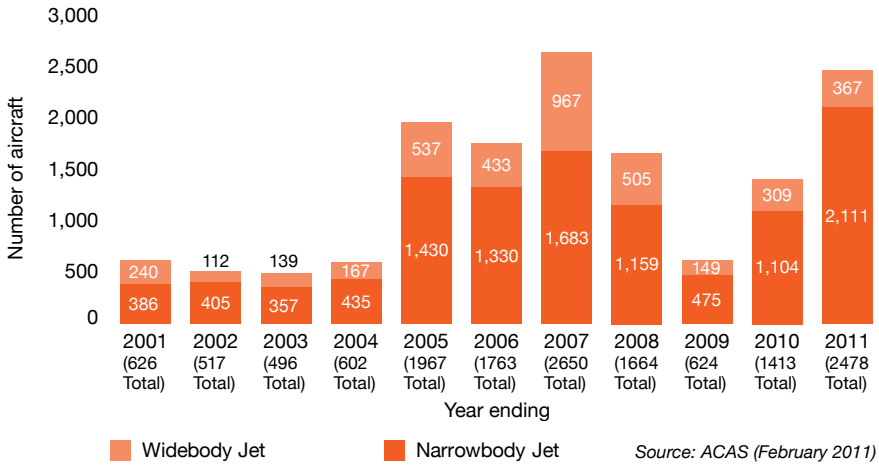
Oshkosh Defense dropped 14 spots from #19 to #33

Source: PwC

Commercial aerospace leads the way

Record deliveries and backlog, new aircraft launches, and first flights

Airliner market view—New orders



Source: ACAS (February 2011)

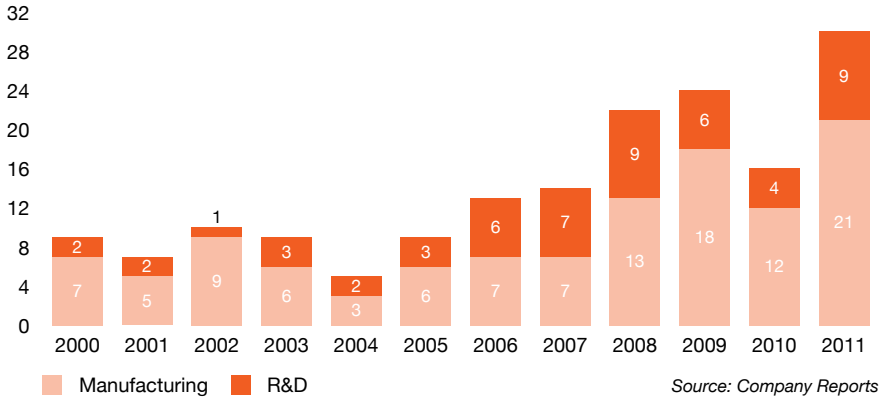
Boeing was, again, the industry's largest company, reporting $68.7 billion in revenue, a 7% increase, on the strength of commercial aircraft deliveries. EADS increased revenue from €45.8 billion to €49.1 billion, also 7% (13% when translated into U.S. dollars). EADS reported the largest revenue growth, $7.7 billion, nearly grabbing the top spot on our list, finishing narrowly behind Boeing by only $407 million. Predominantly commercial aerospace companies generally reported strong revenue growth. United Technologies, GE Aviation, and Honeywell Aerospace also reported 7% growth. Companies reporting double-digit growth include Safran, Goodrich, Precision Castparts, Harris, and Spirit Aerosystems. Triumph Group reported the largest revenue percentage increase, 124%, on the strength of its acquisition of Vought. Triumph also made the largest upward movement on the list, advancing 26 spots to #43. Oshkosh Defense reported the largest drop in revenue and profit as a result of lower M-ATV production due to the decreasing tempo of operations in Iraq and Afghanistan.

Boeing was also the industry's most profitable company, with $5.844 billion in operating profit, an increase of 18%. Thales reported the largest profit percentage increase, 471%, due to the absence of large programme charges recognised in 2010 for Meltem Marine Patrol and A400M. Industry operating margin decreased 27 basis points to 8.86%. Despite the record results, the industry as a whole continues to find double-digit operating margin elusive. The industry's best operating margin belongs to Transdigm, at 40.4%, down slightly from 43.8% the prior year.

Globalisation

The A&D industry continues to globalise. Companies are reporting increased foreign direct investment, with the rate approximately doubling from a decade ago. For investments in manufacturing, China and India have been the top targets. The United States is third, on the strength of its market size and capabilities. Fourth on the list is Mexico, which has developed an aerospace manufacturing niche. India was the top target for R&D investments, while China came in seventh, presumably because of concerns over intellectual property protection. The United States was the second most popular target for aerospace and defence R&D investments.

Investments by Top 50 Global A&D companies in international markets



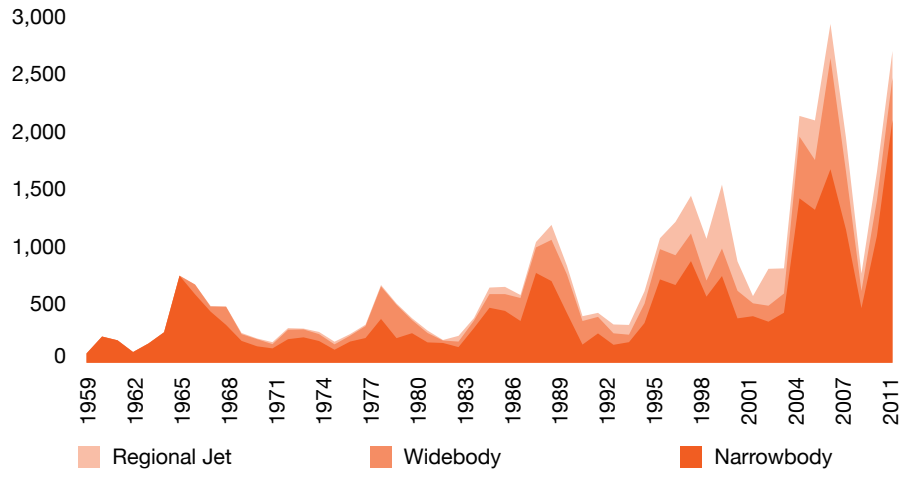
Source: Company Reports

2012 forecast and risks

For 2012, we expect more of the same based on the trends revealed by the data. We expect continued growth in commercial aerospace, resulting from strong and steady demand for global aviation and increased commercial aircraft production. In the early part of 2012, economic indicators are generally positive. However, geopolitical risk with Iran is driving up oil prices, which could threaten the fragile economic recovery. Also, programme management risk is always present, in particular supply chain risk. PwC's analysis indicates that total aircraft production will grow at 10% compounded annual growth through 2016, placing significant strain on the supply chain. A recent PwC study found that 21% of the supply base demonstrates significant capacity and/or financial risk. Furthermore, the Japanese tsunami has caused companies to take a closer look at geographical risk and sole source arrangements. While revenue is expected to rise, there is a significant risk that return on sales could drop due to supply chain inefficiencies. During prior periods of growth, raw material and supply shortages have resulted in late deliveries, rush shipments, out-of-sequence work, and overtime, which have prevented the benefits of higher volume from dropping to the bottom line.

Defence revenues should, again, be modestly lower. However, recent cost-cutting actions in the United States and Europe should mitigate the impact to the bottom line. There are also some risks that are difficult to forecast, such as the effect of destabilisation of the geopolitical environment in the Middle East on defence spending. Overall, the industry should report another strong year in 2012 and quite possibly another record, on the strength of commercial aerospace.

Historical net orders



Source: Airline Monitor, Company Reports

Commercial aerospace

Record deliveries and backlog, new aircraft launches, and first flights

The industry delivered a record number of large aircraft, exceeding the 1,000 mark for the first time; Boeing and Airbus each launched new narrowbody aircraft with unprecedented efficiency improvements; the second-best year for orders pushed backlog to new highs; and the 787 made its first revenue flight.

Boeing and Airbus delivered, in aggregate, 1,011 aircraft in 2011. Airbus delivered 421 single-aisle aircraft, or 35 per month, while Boeing delivered 372 single-aisle aircraft, or 31 per month. Both companies have announced future production rate increases. In addition, Airbus recognised a record year of 1,419 net orders, while the industry recorded 2,224 net orders for large commercial aircraft, the second-best year in aviation history, after 2007, pushing backlog to a new record of 8,208 aircraft, more than eight years at current production rates. Boeing's backlog is at a record $293 billion and Airbus' backlog is at a record $679 billion (at list price), a 41% increase.

Backlog (US$ billions)	12/31/11	12/31/10	12/31/09	12/31/08
Boeing	$293	$256	$250	$279
Airbus*	$679	$480	$459	$471

* at list price

Aircraft backlog	Boeing	Airbus	Total
Backlog at December 31, 2010	3,443	3,552	6,995
Net orders	805	1,419	2,224
Deliveries	477	534	1,011
Backlog at December 31, 2011	3,771	4,437	8,208

Source: Boeing annual report; EADS annual report

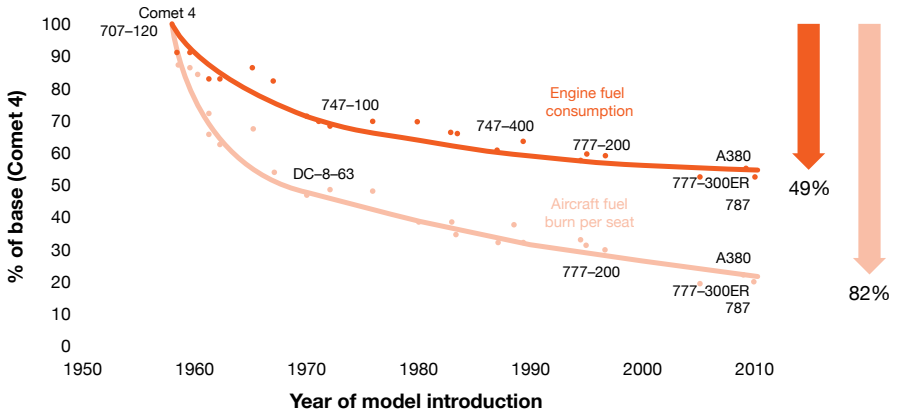
IATA statistics	2011	2010
Revenue passenger miles	+5.9%	+8.2%
Load	78.1%	78.4%
Cargo freight ton miles	-0.7%	+20.6%
Load	45.9%	53.8%

Source: IATA

For 2011, the International Air Transportation Association (IATA) reported revenue passenger growth of 5.9%. This level of demand bodes well for the 20-year forecast of approximately 33,000 new planes at a value greater than $4 trillion. Airline profitability is projected to be about $7 billion globally in 2011. However, rising oil prices continue to threaten profitability into 2012.

Order activity was driven in large part by the launch of two new single-aisle aircraft, the A320NEO and 737MAX. Both offerings are re-engined versions of the existing models, promising at least 15% efficiency improvement. To put this in perspective, aircraft engines have achieved 49% efficiency improvement in more than five decades of the jet era, or about 1% per year. But the gains were greater in the early years and the industry has averaged only about 0.5% improvement per year in the past three decades. So, a 15% improvement in one generation is a significant advance in efficiency.

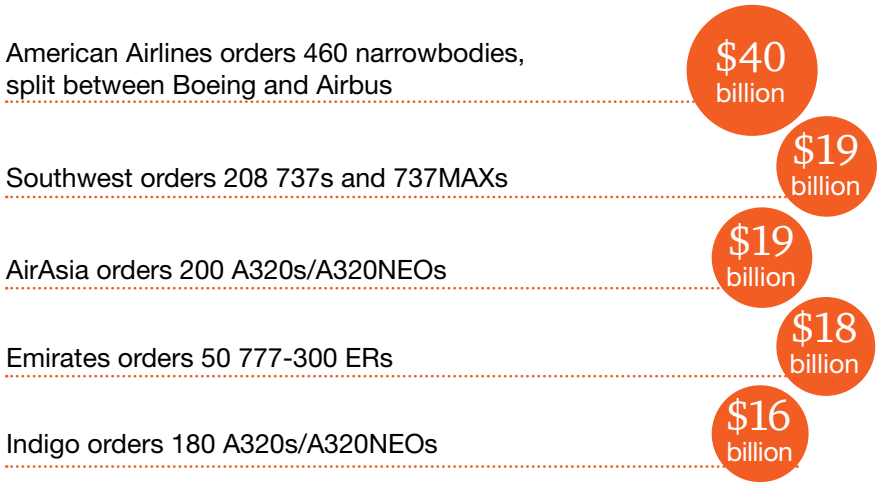
Fuel efficiency gains since the early jet age



Source: Air Transport Action Group

The launch of these new, more efficient aircraft unleashed a fury of orders, both in the expanding Asian market and among U.S. carriers, which have a significant need to replace an aging fleet of inefficient aircraft, which are highly vulnerable to volatile fuel prices. But there was also significant activity in the widebody market as well. In fact, numerous deals in 2011 set records for deal size:

2011 witnessed several record-setting orders



Source: Boeing and EADS press releases

Commercial aerospace 2012 forecast: fair skies but risks loom

For 2012, both Boeing and Airbus are each expected to deliver near 600 aircraft, a 15% to 20% increase over 2011. The increase is more significant for Boeing, driven primarily by production ramp-up in 787 and 747. This is a significant increase for an industry which, arguably, has the most complex and longest lead time supply chain. The challenge will be avoiding prior issues in raising production rates. Previous years have witnessed raw materials shortages, late deliveries, out-of-sequence work, overtime, and rush shipments throughout the supply chain, all of which erode the benefits of higher volume from dropping to the bottom line. The industry will face these challenges not only in 2012 but in the longer term as capacity constraints bump up against eight years of backlog. Original equipment manufacturers (OEMs) and suppliers are encouraged to perform thorough supplier capacity and readiness assessments.

While it is difficult to predict orders, it is unlikely that orders will keep the pace of 2011. Already 2012 is off to a great start. At the Singapore Air Show, Lion Air announced an order for 230 Boeing aircraft valued at $22.4 billion. That's the largest single order in aviation history. Separately, Norwegian Air Shuttle placed orders for 222 narrowbody aircraft, split between Boeing and Airbus. Boeing is expected to book about 1,000 net orders in 2012 and industry executives anticipate orders to be around 1,600 to 1,800, pushing backlog to another new high by the end of 2012.

For the past three decades, leased and financed aircraft have steadily grown to represent about half of the commercial airline fleet. Leasing companies have about 16% of the current backlog, a historic high. Aircraft lessors will become even more important as their more stable business models, diversified portfolios, and comparatively higher grade ratings ease their access to the capital markets.

The European Sovereign debt crisis, ongoing uncertainty in the financial markets, and, in particular, the retreat of the French banks (who have historically played a dominant role in the European aviation financing market) are causing ongoing tensions in the funding market. These tensions have been heightened by the implications for the banking system that Basel III, requiring improvement in capital ratios and tightening of credit conditions, may result in more expensive debt where it is available.

A savior of aircraft financing over the last few years has been Export Credit Agency (ECA) financing. Traditionally a backstop, this has now become the funding source of choice for many airlines. However, going forward the new Aircraft Sector Understanding (ASU) which governs pricing of ECA financing will come into force in 2013 and will result in considerable premium increases for this financing stream.

Another risk in 2012 is that the Export Import Bank (EXIM) is close to its funding limit of $100 billion. Without further U.S. government support, a lack of EXIM financing could threaten both current year deliveries and future orders. Furthermore, U.S. airlines are protesting EXIM on the basis that it provides advantages to foreign airlines that are not available to domestic airlines.

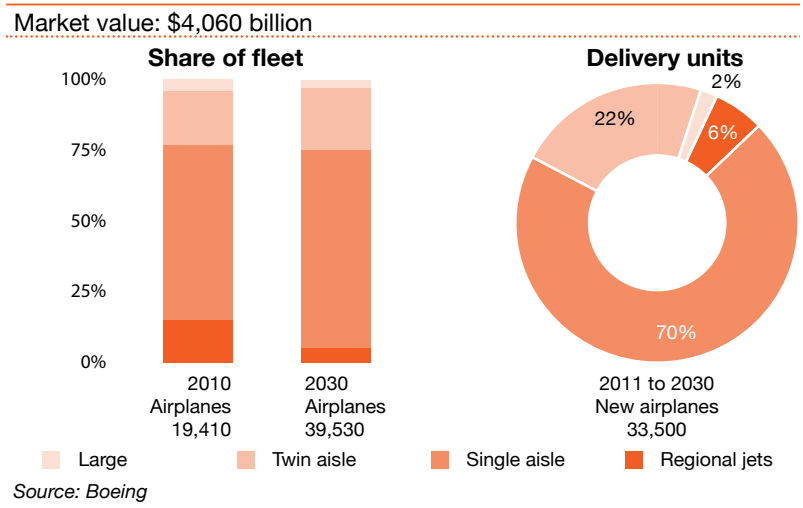
Space

2012 is scheduled to be a big year for space. Both SpaceX and Orbital Sciences are scheduled to dock spacecraft with the International Space Station under the Commercial Orbital Transportation Services (COTS) programme. In addition, research and development continues under the Commercial Crew Development (CCDev) programme. Companies receiving funding from NASA for CCDev include Boeing, SpaceX, United Launch Alliance, Blue Origin, and Sierra Nevada (NASA press releases, www.nasa.gov).

Long-term forecast

The long-term forecast for commercial OEM aircraft is more than 30,000 deliveries in the next 20 years at a value of around $4 trillion. While some have raised questions about whether these forecasts are optimistic, they are based on solid assumptions about global economic growth and the rate of aircraft replacement. In fact, the significant efficiency improvements of new aircraft may accelerate the demand for replacement aircraft. With long-term demand at more than 1,500 aircraft per year and current production rates at 1,000 per year, the industry has both a lot of future growth and a lot of cushion to absorb any softening in demand. Perhaps a key competitive advantage in the future will go to the company that can effectively raise production rates fastest to shorten delivery times.

At the same time, new competitors have emerged to try to take advantage of the growing market. Commercial Aircraft Corporation of China (COMAC) has launched its C919 aircraft with first scheduled deliveries in 2016. COMAC is projecting to sell more than 2,000 planes, or about 7% market share. In addition, Irkut of Russia has launched a narrowbody aircraft and Bombardier is marketing its CSeries. Embraer has elected to stay in its regional niche and not enter the increasingly crowded narrowbody market.



Source: Boeing

Growth in business jets

The business jet rebound continues to be elusive and slower than was expected at the beginning of the year. Positive signs in the first half of the year were eroded by weakness in the back half of the year, and overall cycles for the year were only modestly higher, leaving the business jet industry still more than 10% below the 2007 peak.

Companies are reporting that business jet backlogs have been cut approximately in half since the start of the recession. The recovery in business jets is expected to track the overall Western economic recovery, which continues to be slow. Therefore, business jets should see another year of modest improvement. The medium to long term for business jets should see significant growth, driven by economic growth and adapting regulations in Asia and the Middle East, particularly in China. These longer routes favour the larger segment of the business jet market.

Defence

U.S. defence contractors have a flat year, while European colleagues fared a little worse

The top six U.S. defence companies reported revenues down about 1% and profits up about 1%.[1] This is not surprising since the U.S. defence budget was essentially flat. The only thing certain about the future defence budget is that it will be lower, but it's anyone's guess how much. The president's budget proposes a modest 1% decrease in the fiscal 2013 budget and approximately $500 billion in cuts over the next decade, or approximately 10%. However, many members of Congress strongly oppose this level of cuts. Furthermore, the budget battle is taking place against a backdrop of a presidential election and an impending sequestration, which could require even deeper cuts. The future defence budget will likely be significantly shaped by the 2012 elections.

During 2012 European defence ministries started to deal with the detailed consequences of budgetary reductions by cutting and re-profiling programmes and reducing platform numbers. This process has yet to fully unwind, leading to considerable uncertainty in the supply base as companies struggle to manage both the impact of known reductions and the risk of uncertain future reductions. Initiatives to preserve capability at the same or lower cost have burgeoned (in Germany, Sweden, Norway, and the UK, for example) and there has

1 Annual earnings reports: Boeing, Lockheed Martin, General Dynamics, Northrop Grumman, Raytheon, and L-3

been a growing appetite for capability and cost-sharing between nations. The NATO Secretary-General's "Smart Defence" initiative seeks to achieve this for the Alliance, and bilateral arrangements such as the Anglo-French Defence Co-Operation Treaty seek collaboration in a range of activity from military operations to acquisition. NATO's operations in Libya highlighted the importance of being able to respond to unforeseen events—the "return to contingency"—and of a strong blend of European capabilities able to be deployed at short notice. Though the Libyan operation was relatively short-lived, it suggested capability gaps that European nations will find difficult to plug while under the current financial pressures.

Just as European defence companies come to terms with decline in their traditional markets, so they are simultaneously pursuing opportunities in growth markets; the Middle East, Brazil, South East Asia, and India all offer growth, although there is strong competition and in-country barriers to entry can be challenging.

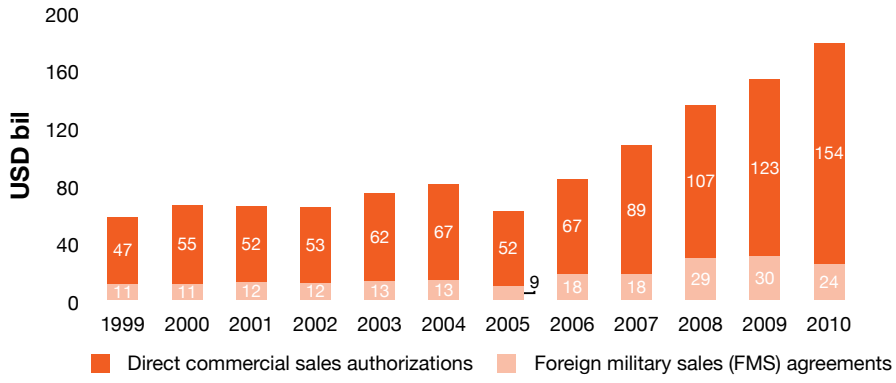
Backlog (US$ billions)	12/31/11	12/31/10
Lockheed Martin	$81	$78
EADS Defence	$73	$83
Finmeccanica	$64	$70
BAE Systems	$58	$63
Boeing Defense, Space & Security	$46	$48
Thales	$43	$34
General Dynamics (exc. Gulfstream)	$40	$42
Northrop Grumman	$40	$64
Raytheon	$35	$36
L-3	$11	$11
Total	$491	$511

Source: Company reports

Exports

The growth of defence export deals has led to a record backlog of $327 billion at mid-year 2011. "We have in excess of 13,000 active cases with more than 165 countries and institutions," adding up to about $327 billion, said Vice Admiral Bill Landay at a Pentagon news briefing ahead of the Paris Air Show. (Source: Bloomberg)

U.S. foreign military sales (FMS) agreements and direct commercial sales authorizations



Source: US Department of Defense, US Department of State

One bright area of opportunity for defence contractors has been exports. The annual volume of U.S. defence export sales agreements has more than doubled from 2006 through 2010 (the most recent year of available data). Much of the growth during this period has been in Asia due to concerns over China's growing military power and tensions between North Korea and South Korea, and in the Middle East due to concern over Iran's military ambitions. Some highlights from 2011 include:

- Saudi Arabia will buy 84 F-15s and upgrades to 70 others, worth $30 billion (Bloomberg)
- India selects Dassault Rafale fighters worth $10 billion (BBC)
- Japan selects F-35 for next generation fighter, in a deal worth approximately $8 billion (Washington Post)
- Taiwan to upgrade F-16 fleet worth $6 billion (Business Week)
- The United Arab Emirates buys THAAD missiles worth $3.5 billion (Bloomberg)
- India buys 10 C-17s worth $2 billion (India Times)

Future export opportunities include:

- Turkey affirms plans to buy 100 F-35s worth $16 billion (Reuters)
- South Korea gears up for a jet fighter competition (Defense Industry Daily)

Defence forecast

The current focus remains on affordability. The U.S. Defense Department now lists affordability among its procurement criteria on its website. Contractors need to stay focused on improving productivity. We are entering a period of fewer new platforms. But at the same time, there is a need to recapitalise equipment. So, the focus will shift from new platforms to platform upgrades and sustainment. It's nearly impossible to predict the overall health of the defence industry beyond a few years down the road. The uncertainty of sequestration, the presidential election, the U.S. military's role in world affairs, a tightening Pentagon budget, the growing threat of Iran's nuclear weapons programme, continued threats of terrorism, the possible fall of governments in the Middle East, and other factors will influence the long-term picture. The fiscal 2012 U.S. defence budget is roughly flat, and the proposed 2013 budget reflects only a modest decrease, so we expect another year of flat performance for the defence industry in 2012.

During 2012 we will start to see some stability return to the European defence markets as defence ministries work through the rounds of budget cuts instigated two years ago. There is little likelihood of any budgetary increases until 2015 and it may be necessary to pare some defence budgets still further if the Eurozone's austerity measures have to be tightened. The UK will announce a "balanced defence programme" (London Times) for the first time in a generation, which will provide clarity for OEMs after some years of uncertainty. At the same time, accelerated "transition" in Afghanistan will start to manifest itself in rationalizing in-theater equipment and logistic support and an increase in logistic movement as military materiel is redeployed. The next few years will see an enhanced tempo of equipment refurbishment as a result, though the extent of this, and its effect on industry, has yet to be quantified.

European nations will continue their various transformation programmes aimed at preserving capability at lower cost and will import many of the ideas and concepts pioneered in the UK a few years ago; we will see an increase in availability contracting for land, sea, and air platforms, plus an increasing appetite for industry-led solutions in the provision of training, infrastructure, and back office shared services. We will also see programmes for industry take on more complex and broader roles—the UK's Materiel Strategy may prove to be a pioneering approach. The drive for exports will also continue and will remain fiercely competitive as global defence industry competes in the growth markets.

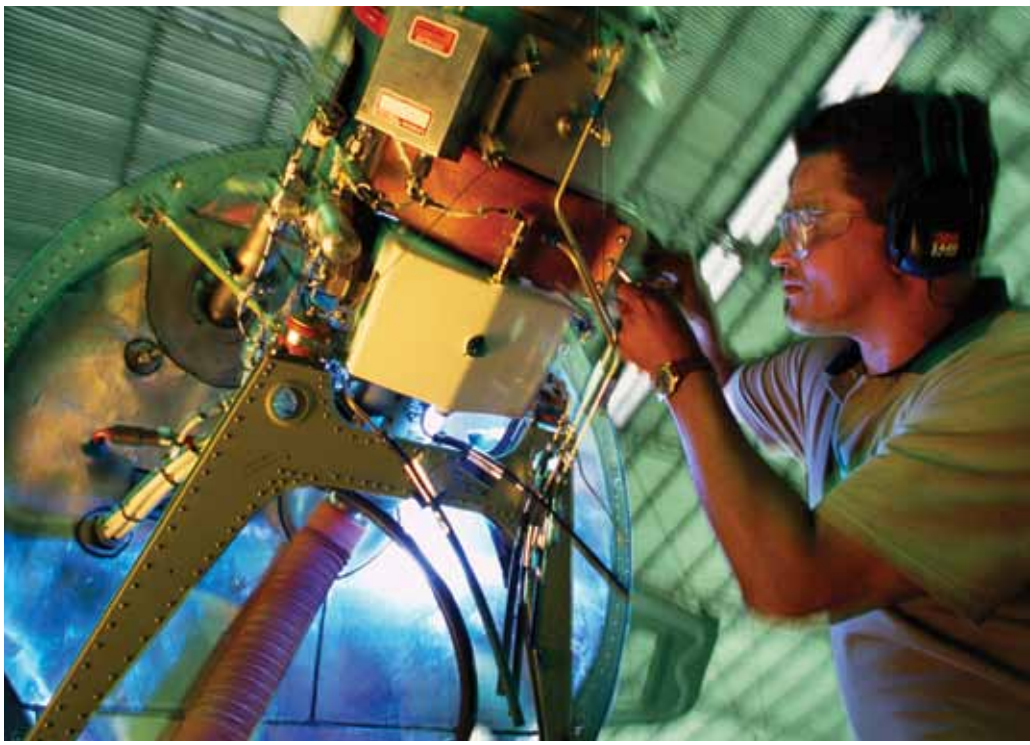
So while the traditional, platform, and equipment-based defence markets in Europe remain under intense pressure, opportunities exist for industry more broadly to deliver service-based capabilities in many countries. In the UK, the whole of the defence support services market is projected to be worth an estimated £16 billion per year by 2020, or approximately 75% of total MoD spend with industry; these trends will accelerate in Europe (PwC assessment based on public domain sources, 2012).

Here are three challenges the industry might consider to thrive in the future:

1 Innovation

Investment in innovation during a period of tight budgets will be critical to the health of the defence industrial base and global security. Historically, innovation in defence research and development leads to myriad commercial applications, such as the Internet, GPS, and commercial satellite communications. Once the F-35 Joint Strike Fighter completes development, there will be no military fighter aircraft in development for the first time since the innovation of flight. In addition, the United States needs to rapidly crystallise its exploration strategy, where many new technologies are born.

The threat environment is also unpredictable. For example, while the capabilities of China's J-20 fifth-generation fighter are still unknown, the threat is years ahead of prediction. The United States should consider preserving its specialised aircraft engineering talent to develop the sixth-generation fighter.



2 Productivity: getting leaner

The Pentagon has been placing an emphasis on affordability and has now formally included affordability on its website as an evaluation criterion for procurement decisions. Accordingly, defence contractors have made moves to reduce costs and improve productivity. We compared defence companies to companies in the Dow Jones Industrial Average (DJIA) on the basis of revenue per employee using data from company earnings statements and company profiles. We acknowledge that revenue per employee is an imperfect measure. A better measure would be value added per employee, but since that data is not available, we used revenue per employee as a reasonable surrogate. In this comparison, we see that defence contracts are about half as productive as the DJIA.[2] We believe there are some valid reasons why defence companies have lower productivity, including:

- ***Limits on profitability*** – Much of defence revenue is under cost-reimbursable, or cost-based, fixed price contracts, where revenues are limited based on profit limitations. Defence contractor profitability is typically a little more than half of the DJIA.
- ***Development of leading technologies*** – Defence contractors are frequently developing cutting-edge technologies, which are inherently manually intensive and involve some trial and error.
- ***Extremely low volumes*** – Many defence contracts are for single units or quantities measured in the dozens or hundreds, compared to commercial enterprises that typically measure volumes in the millions of units. The low volumes result in manually intensive manufacturing and assembly and low absorption of fixed costs in a capital-intensive industry.
- ***Regulation*** – The industry is highly regulated, which can increase compliance costs, including compliance with federal acquisition regulations (FAR) and cost accounting standards (CAS) and export controls (International Traffic In Arms).

Despite these inherent limitations, the industry recognises there is room for improvements in productivity and many companies have been taking actions to reduce overhead costs, including workforce reductions, early retirements, and facilities consolidation. Other challenges include direct product costs, which will be more challenging. We believe the following areas offer opportunities:

- Programme management/shortened development cycle
- Supply chain management
- Information technology
- Knowledge management

2 PwC report, “Defense: The affordability imperative”

Improving the speed and effectiveness of programme development usually produces the biggest gains in affordability. Schedule delays are the biggest factor in budget overruns. While contractors take pride in their programme management abilities, the industry must seek continuous improvement, including unbiased, independent assessments and benchmarking.

The defence supply chain has become extremely complex. It is common that 50% to 80% or more of the total value of production lies in a technically complex, multi-tier supply chain. Defence contractors can no longer accept that long lead times and marginal supplier performance are the industry norm. The industry must challenge itself to get much closer to "just in time" delivery. The industry might consider adopting leading-edge risk management practices to regain visibility into the supply chain that has been lost through outsourcing.

Information technology represents one of the biggest areas for discretionary spending at most companies, including defence firms. Many A&D companies have invested millions in systems implementations but haven't yet realised the full capabilities and productivity enhancements that these systems enable. Many IT organisations are still spending most of their time in legacy system maintenance and enhancements. Companies need to unlock the full capabilities of their IT platforms, become leaner, and migrate the IT organisation away from costly maintenance toward strategic initiatives and competitive advantage.

Finally, improved knowledge management will become more critical. The industry was already facing a talent drain because of demographics. Now that talent drain has been accelerated by early retirements and workforce reductions. Companies need to identify the key people and knowledge in their organisations and capture that information using searchable technology tools. But they also need to create a knowledge management culture that promotes and rewards the effective capture and use of knowledge.

Companies that embrace the affordability challenge and execute on these critical areas will create greater value for the war fighters, taxpayers, and shareholders.

3 The regulatory environment

The current regulatory environment is certainly a key factor on the defence industry.

Several reforms may help improve the environment for A&D companies.

Acquisition reform

Attempts to improve the current defence acquisition process have not yet met the desired outcomes. One reason is that reforms have sought to place ever increasing regulations on the contractors. Acquisition reform might benefit from addressing how Congress funds long-term programmes on a short-term basis and the manner in which the customer initially defines requirements and the impact of subsequent modifications. Our recommendations include:

- Addressing the definition and stability of requirements
- Establishing realistic budgets and funding based on the inherent risks of developing advanced technologies
- Promoting flexibility and innovation in the bid and proposal process
- Using contract structures appropriate to risk
- Promoting international cooperation and cost sharing

The Defense Contract Audit Agency

The purpose of the Defense Contract Audit Agency (DCAA) is to protect the government and taxpayers from fraud and abuse. The following reforms could improve the effectiveness and efficiency of DCAA audits:

- *Audit approach* – Benchmark the audit approach against commercial practices such as those regulations established under the American Institute of Certified Public Accountants (AICPA) and Public Company Accounting Oversight Board (PCAOB).
- *Materiality* – Establish materiality standards. Materiality is not defined for government contracting exceptions. It is widely accepted in commercial practice that it is impractical and cost prohibitive to build a control system to catch minor errors.
- *Third-party reliance* – The DCAA's resources are limited. While DCAA standards allow for reliance on third parties, it is seldom done. The DCAA could consider establishing standards for third-party reliance that promote such use where the third party is objective and competent to improve the speed and efficiency of the regulatory process.

Export control reform

Many people believe that current export control regulations are outdated and present a competitive disadvantage to the U.S. defence industrial base. Many technologies that are broadly used in commercial application are still subject to export control restrictions. A good example is satellites. U.S. companies still face export control restrictions on products that are sold commercially. President Obama is a supporter of export reform.[3] Lawmakers should expedite export control reform to promote U.S. exports and preserve key skills in the industrial base.

3 www.whitehouse.gov, "Fact Sheet on the President's Export Control Reform Initiative," 2010.

Mergers and acquisitions

Spinoffs and divestitures mean new activity

Aerospace M&A pushes deal totals to record levels[4]

2011 was a record year for aerospace and defence transactions. The 341 deals and $43.7 billion of deal value announced during 2011 beat the previous highs: 332 deals in 2010 and $42.0 billion of value in 2007. The $16 billion United Technologies acquisition of Goodrich Corporation was the primary value driver. Volume drivers were more broad-based, with higher numbers for small deals (less than $50 million) and mega deals (above $1 billion) alike. Although mega deals were not as common in 2011 as they were in 2007, these transactions have continued their recovery from the recent low of only two such announcements in 2009 up to six in 2011. This led to an increase in average deal sizes, even when removing the impact of the Goodrich deal. The Goodrich transaction boosted U.S. total deal value above historic norms despite a drop in the number of U.S. deals. There was also a big increase in deals for aerospace targets in 2011, measured on both a volume and value basis. This, when considered alongside the higher sales multiples awarded to aerospace compared with defence targets, reflects the more favourable outlook for this part of the sector.

4 PwC, "Mission control, fourth quarter 2011"

Defence divestitures and private equity exits boost large deal volume

Divestiture of slower-growth defence businesses and private equity exits dominate the list of largest deals. Two headline divestitures, the Northrop Grumman shipbuilding spin-off and the break-up of ITT, ranked among the top five deals this year. In addition, four of the top 10 deals were sales by private equity companies to strategic investors. On the buy side, only one private equity purchase made the list: the Providence Equity Partners acquisition of SRA International. The 2011 largest deal targets were much more varied than in 2007, when the focus was mainly on aerospace targets. Also, more big deals predominated in the earlier record year; eight of the 10 largest deals in 2007 were for values at or above $1.8 billion, compared with just four such deals in 2011. Private equity exits played a role in each year. Activist investors had a part to play in some of the large 2011 divestitures but financial investor involvement was most evident in the smaller deals.

Europe and the United States drive global activity as Asia takes a step back

European acquirers played a much more significant role in the 2011 aerospace and defence deal market compared with 2010. The pace of market consolidation hastened within Europe and outbound deals also increased. The focus was firmly trans-Atlantic; all European outbound deals above the $50 million threshold in 2011 were for North American targets, boosting the number of cross-border deals for U.S. targets. There was also important activity for non-U.S. companies that have significant U.S. revenues, as a means of increasing exposure to the largest defence market in the world. One rationale for these types of deals is that, in some cases, they may be easier to close. Transactions involving Asian acquirers declined year on year.

Deal volumes likely to grow in 2012

With OEM backlogs contributing to higher overall sector growth prospects, aerospace M&A is likely to continue to lead the A&D deal market in 2012. The outlook for defence is somewhat less certain. Defence M&A will likely remain oriented toward large spin-offs of lower-growth units and smaller acquisitions in growth areas, such as cyber security. However, the further defence budgets fall, the more likely there could be calls for larger-scale consolidation, which could outweigh antitrust concerns, in order to maintain a strong defence industrial base. Strategic investors have significant cash positions and appear well-positioned to drive a high volume of deals in 2012, both large and small. Deal volume, if not deal value, could be set to break another new record in 2012. In particular, EADS is looking to grow its U.S. presence through acquisitions. The company gets less than 3% of its revenue from U.S. subsidiaries and has stated its intention to grow its U.S. revenue from $1.8 billion today to about $10 billion.

However, we also believe further consolidation is likely. The U.S. Defense Department has indicated that it will oppose any deals that create a sole source supplier. Therefore, it is unlikely we will see any consolidation among the top 10 players, but there remains ample opportunity for other companies in the A&D arena. We see C4ISR as a pocket of growth in an otherwise flat market. Also, given the reduced tempo of operations in Iraq and Afghanistan, it may be time for further consolidation of land systems providers.

Looking ahead, we point to four themes that are likely to affect M&A activity in the coming years:

- Increasing consolidation as companies respond to cost pressures
- Further re-evaluation of supply chains by big manufacturers, in both civil and military segments, as they seek to gain better control of their large programme pipelines
- Continuing growth in the security, surveillance, and homeland security sector
- Greater investment in and competition from fast-growing markets, most notably China

We believe these trends will provide the context for continued growth in deal volume, although deal value is unlikely to keep pace with the record year of 2011.

In summary

The performance of the top 100 A&D companies is a barometer for the health of the industry and a reflection of strong and disciplined management over the past decade. It also reflects the strong demand for the industry's products and services.

Aviation has become a critical part of our global infrastructure. Businesses cannot operate effectively without global deployment of human capital. Aviation is increasingly inelastic, as we witnessed its resiliency during the recession. And while air freight is still dwarfed by sea and land freight, an increasing portion of the global supply chain now relies on air cargo.

The outlook for defence is clouded by the possibility of sequestration in the United States and cuts to the defence budget. However, industry executives believe defence spending will be driven by threats to security, which have not diminished. Furthermore, the security threat is dynamic and could rapidly change defence priorities. The defence industry agrees that it must respond to the affordability challenge and improve productivity.

The near-term and long-term forecast for commercial aerospace is full of optimism and growth. Aviation will continue to grow faster than the overall economy because of its critical role in the global economic infrastructure, bolstered by economic growth in Asia, the Middle East, Eastern Europe, and Latin America. Defence faces some challenges, but is well positioned to respond to these challenges so long as sequestration doesn't become a reality. 2012 should be another strong year for the industry and possibly another record year.

#	Company	Revenue US$ millions 2011	2010	Change	Operating Profit US$ millions 2011	2010	Change
1	Boeing	68,735	64,306	7%	5,844	4,971	18%
2	EADS	68,328	60,599	13%	2,243	1,572	43%
3	Lockheed Martin	46,499	45,671	2%	3,980	4,049	-2%
4	General Dynamics	32,677	32,466	1%	3,826	3,945	-3%
5	BAE Systems	30,745	34,428	-11%	2,536	2,474	2%
6	United Technologies	26,935	25,227	7%	3,921	3,621	8%
7	Northrop Grumman	26,412	28,143	-6%	3,276	2,827	16%
8	Raytheon	24,857	25,183	-1%	2,857	2,607	10%
9	Finmeccanica	24,086	24,762	-3%	(3,318)	1,631	-303%
10	GE Aviation	18,859	17,619	7%	3,512	3,304	6%
11	Thales	18,120	17,364	4%	1,010	(272)	471%
12	Rolls Royce	18,101	16,794	8%	1,936	1,561	24%
13	Safran	16,214	14,607	11%	1,161	1,242	-7%
14	L-3 Communications	15,169	15,680	-3%	1,598	1,750	-9%
15	Honeywell Aerospace	11,475	10,683	7%	2,023	1835	10%
16	SAIC	11,117	10,846	2%	958	867	10%
17	Bombardier Aerospace	8,614	9,357	-8%	448	473	-5%
18	Textron	8,387	7,783	8%	722	628	15%
19	Goodrich	8,075	6,967	16%	1,336	998	34%
20	Huntington Ingals	6,575	6,723	-2%	110	248	-56%
21	Precision Castparts Corp.	6,220	5,459	14%	1,503	1,423	6%
22	CSC North American Public Sector	6,002	6,095	-2%	528	524	1%
23	Mitsubishi Aerospace	5,923	5,696	4%	(43)	(73)	41%
24	Harris Corp	5,920	5,206	14%	588	562	5%
25	Exelis	5,839	5,891	-1%	535	689	-22%
26	Embraer	5,803	5,364	8%	318	392	-19%
27	Spirit AeroSystems	4,864	4,172	17%	356	357	0%
28	Alliant Techsystems	4,842	4,808	1%	526	512	3%
29	Rockwell Collins	4,806	4,631	4%	855	796	7%
30	Singapore Technologies	4,755	4,388	8%	483	430	12%
31	Dassault Aviation	4,597	5,546	-17%	524	783	-33%
32	Babcock International Group	4,424	2,930	51%	254	229	11%
33	Oshkosh Defense	4,365	7,162	-39%	543	1,321	-59%
34	MTU Aero Engines	4,078	3,585	14%	456	412	11%
35	Zodiac	3,804	2,830	34%	512	307	67%
36	Delta Tucker Holdings / DynCorp International	3,721	3,696	1%	48	97	-51%
37	Saab	3,615	3,394	7%	452	135	234%
38	CACI	3,578	3,149	14%	251	195	29%
39	IHI Aero Engines and Space Operations	3,438	3,304	4%	73	102	-29%
40	Israeli Aerospace Industries	3,436	3,148	9%	133	52	156%
41	Rheinmetall Defence	2,978	2,658	12%	310	310	0%
42	Cobham	2,976	2,941	1%	586	538	9%
43	Triumph Group	2,905	1,295	124%	314	155	103%
44	Serco Defense and Americas	2,901	2,882	1%	224	218	3%
45	ManTech International	2,870	2,604	10%	227	215	6%
46	Avio	2,819	2,322	21%	534	449	19%
47	Elbit Systems	2,817	2,670	6%	116	207	-44%
48	Hindustan Aeronautics Limited (HAL)	2,791	2,494	12%	319	254	25%
49	QinetiQ	2,731	2,512	9%	233	186	25%
50	BE Aerospace	2,500	1,984	26%	428	316	35%

#	Company	Revenue US$ millions 2011	2010	Change	Operating Profit US$ millions 2011	2010	Change
51	Kawasaki Aerospace	2,472	2,150	15%	38	19	94%
52	GKN Aerospace	2,377	2,243	6%	266	250	7%
53	Meggitt	2,335	1,796	30%	578	469	23%
54	MOOG	2,331	2,114	10%	246	216	14%
55	BBA Aviation	2,137	1,834	17%	181	156	16%
56	ThyssenKrupp Marine Systems	2,076	1,600	30%	296	192	54%
57	Curtiss-Wright	2,054	1,893	9%	205	180	14%
58	RUAG	2,003	1,727	16%	124	94	32%
59	Allegheny Technologies High Performance Metals	1,956	1,410	39%	365	258	41%
60	Teledyne Technologies	1,942	1,644	18%	227	179	27%
61	Parker Hannifin Aerospace	1,922	1,744	10%	247	208	19%
62	AAR	1,776	1,316	35%	139	94	48%
63	Esterline Technologies	1,718	1,527	13%	198	188	5%
64	Eaton Aerospace	1,648	1,536	7%	244	220	11%
65	CAE	1,647	1,480	11%	262	223	18%
66	Trimble	1,644	1,294	27%	156	128	22%
67	FLIR Systems	1,544	1,388	11%	313	360	-13%
68	Kongsberg Gruppen Defence and Protech	1,443	1,510	-4%	182	207	-12%
69	Hexcel	1,392	1,174	19%	192	130	48%
70	Xi'an Aircraft International Corp	1,372	1,602	-14%	17	56	-70%
71	Orbital Sciences	1,346	1,295	4%	80	73	10%
72	Cubic Corporation	1,285	1,194	8%	112	106	6%
73	TransDigm Group	1,206	828	46%	487	363	34%
74	Chemring Group	1,196	923	30%	228	167	36%
75	Ultra Electronics	1,174	1,097	7%	196	170	15%
76	Barnes Group	1,169	1,029	14%	128	86	49%
77	Bharat Electronics	1,164	1,170	0%	406	221	84%
78	Loral Space & Communications	1,107	1,159	-4%	93	81	15%
79	Titanium Metals (TIMET)	1,045	857	22%	175	121	45%
80	Fuji Aerospace	1,039	1,061	-2%	27	55	-51%
81	Volvo Aero	1,001	1,069	-6%	52	40	29%
82	GenCorp	918	858	7%	39	38	3%
83	Aselsan	899	788	14%	140	142	-1%
84	SIA Engineering	879	740	19%	108	81	33%
85	Woodward Governor Aerospace	843	769	10%	130	112	16%
86	Smiths Detection	819	887	-8%	103	138	-25%
87	ViaSat	802	688	17%	39	43	-9%
88	Latecoere	801	615	30%	62	60	4%
89	Alion Science and Technology	787	834	-6%	35	39	-10%
90	Ball Aerospace	785	714	10%	80	70	14%
91	OHB Technology	773	564	37%	38	30	25%
92	Heico Corporation	765	617	24%	138	109	27%
93	MacDonald Dettwiler & Associates	761	688	11%	117	100	17%
94	Aeroflex	729	655	11%	53	68	-22%
95	Indra Security & Defense	709	787	-10%	71	88	-20%
96	Magellan Aerospace Corp	699	710	-2%	60	61	-2%
97	Crane Aerospace & Electronics	678	577	18%	146	109	34%
98	Senior Aerospace	614	516	19%	88	57	55%
99	Jamco Corp	599	489	23%	(2)	22	-111%
100	Ducommun	581	408	42%	(34)	26	-231%
	Total	677,261	647,593	5%	60,033	59,129	2%

Source: Company reports; PwC

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