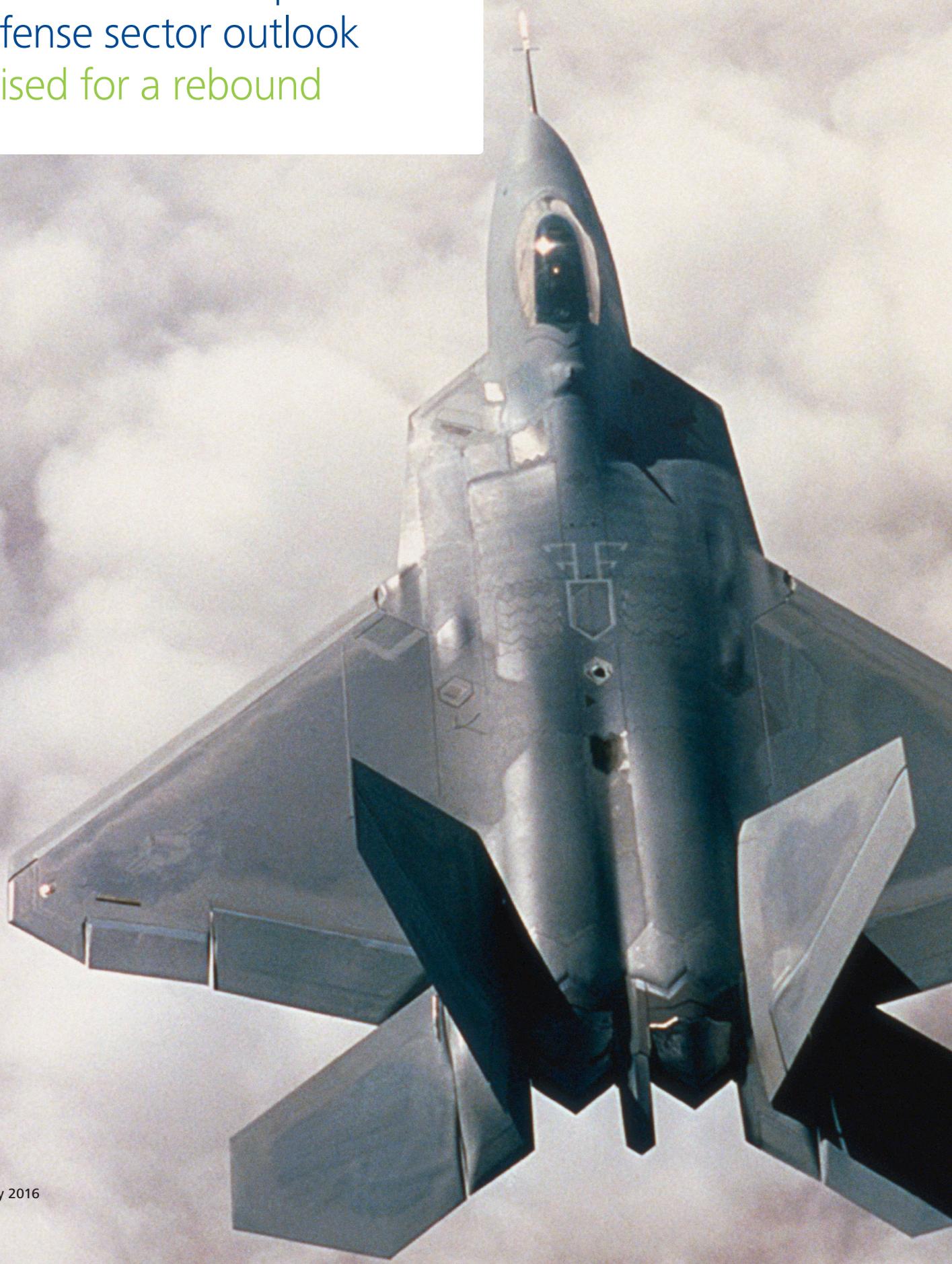


Deloitte.

2016 Global aerospace and defense sector outlook Poised for a rebound





Summary

After several years of revenue expansion, but with a declining trend—5.8 percent in 2012, 3.2 percent in 2013, and 1.9 percent growth in 2014¹ respectively, the overall global aerospace and defense (A&D) sector revenues are expected to decline a nominal minus 0.12 percent in 2015.² This trend of declines in the global sector revenue growth rates was largely driven by decreased revenues in the defense subsector, which suffered from cuts in global military expenditure, mainly from the United States (US). Program cancellations and delays in major weapons programs affected the revenues of the major defense contractors. Moreover, the stronger US dollar adversely affected the revenues of the A&D companies headquartered outside of the US.

However, revenue growth for the global A&D sector is expected to take a positive turn. Stable growth in global gross domestic product (GDP), lower commodity prices especially crude oil, and strong passenger travel demand portend continued growth in the commercial aerospace subsector. Moreover, the resurgence of global security threats and growth in defense budgets in many countries are all likely to promote global defense subsector revenue growth over the next few years. Consequently, total global A&D sector revenues are estimated to grow 3.0 percent in 2016.³



Commercial aerospace subsector outlook

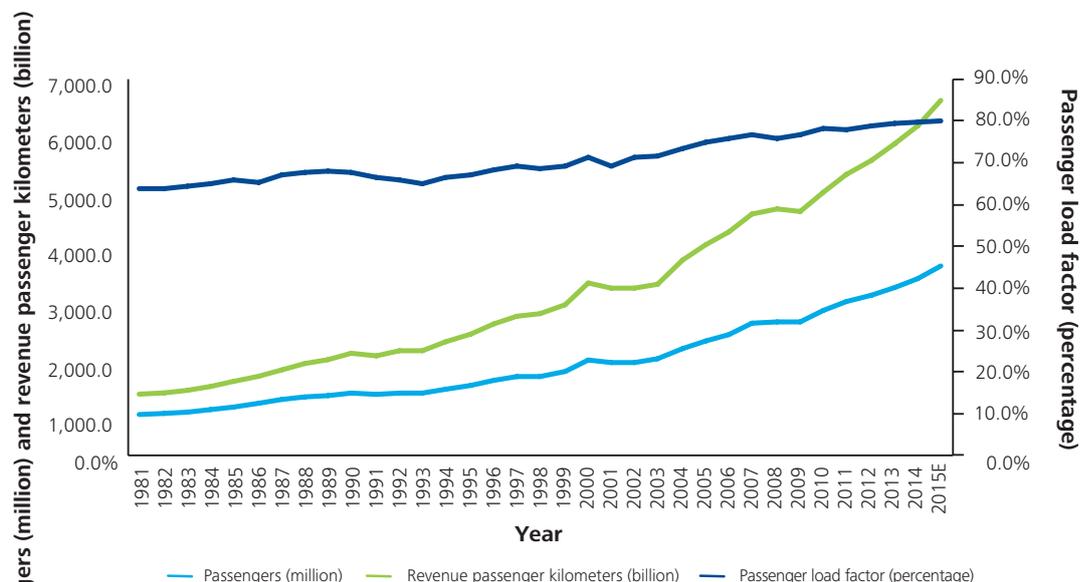
The global commercial aerospace subsector is likely to experience strong revenue and operating earnings growth in 2016, due to continued record production levels driven by strong demand for next-generation aircraft and growing passenger traffic, especially in the Asia-Pacific and the Middle East regions. The worldwide commercial passenger and cargo aircraft fleet, as well as the annual number of passengers are forecast to double over the next two decades.⁴

Passenger travel demand in countries experiencing continued wealth creation—primarily in India, China, the Middle East, and other Asia-Pacific region countries—is driving global passenger leisure and business travel growth and increasing freight transportation requirements. Global revenue passenger kilometers (RPK's) have experienced significant growth over the past three decades, driving greater utilization of aircraft and resulting in more sold out flights. Passenger

and freight traffic are expected to grow at an average annual growth rate of 4.6 percent and 4.4 percent respectively over the next 20 years⁵, contributing to increases in aircraft production. Airbus Group and The Boeing company have a combined order book of over 12,400 aircraft as of the end of the third quarter of 2015, which represents an estimated nine years' of current annual production.⁶

As illustrated in Figure 1, passenger travel demand increased 490.0 percent from 1981 to 2015E, while passenger load factor (utilization of aircraft) has risen 25.9 percent (nominally growing from 63.7 percent to 80.2 percent) during that same period.⁷ In addition, the number of people flying per year continues to increase, with a 371.0 percent increase over that time, which is enabled by more affordable ticket pricing and route availability.⁸

Figure 1: Global airline traffic (1981 to 2015E)

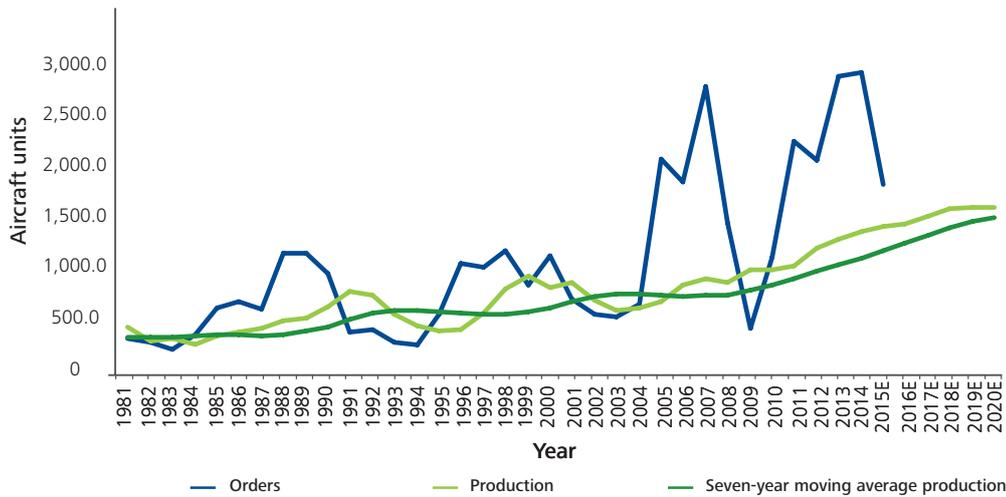


Source: Deloitte Touche Tohmatsu Limited (DTTL) Global Consumer & Industrial Products Industry group analysis of the data from International Air Transport Association (IATA), "Fact Sheet," accessed in June 2015, https://www.iata.org/pressroom/facts_figures/fact_sheets/Documents/fact-sheet-industry-facts.pdf; and Airlines for America, "Annual Results World Airlines," accessed in November 2015, <http://airlines.org/data/annual-results-world-airlines/>.

The total demand for new aircraft production is estimated to be 35,318 aircraft (excluding regional jets) over the next 20 years.⁹ Figure 2 illustrates sales order and production history of commercial aircraft from 1981 through 2015, showing a 228.7 percent increase in production between 1981 and 2015.¹⁰ Using a seven-year moving average, production levels over the last 20

years have increased 104.9 percent since 1995.¹¹ Over the next decade by 2025, commercial aircraft annual production levels are anticipated to increase an estimated 26.6 percent.¹² With such growth expected, there are two significant trends and challenges to consider—the entrance of new global competitors to the existing duopoly and the impact on the supply chain.

Figure 2: History and forecast for large commercial aircraft orders and production (1981 to 2020E)



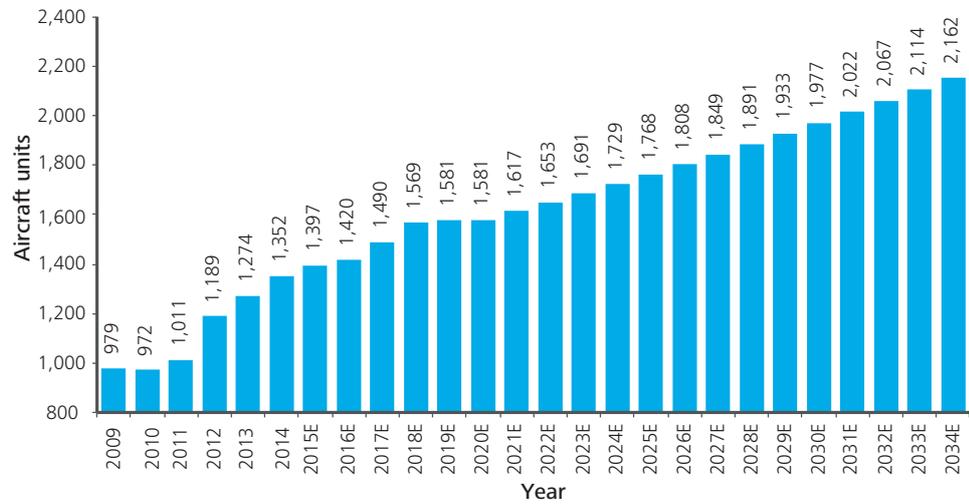
Source: Deloitte Touche Tohmatsu Limited (DTTL) Global Consumer & Industrial Products Industry group analysis of the following data: The Boeing Company, "Order and deliveries," accessed in January 2016, <http://active.boeing.com/commercial/orders/index.cfm>; Airbus Group, "Orders and deliveries," accessed in January 2016, <http://www.airbus.com/company/market/orders-deliveries/>; UBS, *US Aerospace and Defense Playbook*, 16 October 2015; and Credit Suisse, *Global Aerospace and Defense*, 16 October 2015.

First, the subsector has largely been a duopoly since 1997. Prior to that, at least three companies served the industry if not four. Going forward, it is likely that at least one additional competitor may successfully enter this burgeoning market in the next 20 years.¹³ Heightened competition is expected to affect the pace of technology innovation, replacement cycles, and aircraft pricing. In turn, airline operators may have more product choices, requiring original equipment manufacturers (OEMs) and their suppliers, to meet adjusted pricing expectations. Competition will likely increase and premium pricing for aircraft will likely also be impacted by technology innovation, creating

products which are less expensive to operate (e.g. fuel efficiency, maintenance, and repair), and possess new and improved technologies that passengers prefer.

It is estimated that in 2016, 1,420 large commercial aircraft will be produced, which is 40.5 percent more than was produced just five years ago.¹⁴ With planned rate increases for production at the large commercial aircraft producers in the next two years, it is likely that in five years (by 2021); the sector will be producing 1,617 aircraft, a 15.7 percent increase from 2015.¹⁵ Figure 3 shows aircraft production since 2009, as well as the estimated production volume by year over the next two decades, which illustrates the outstanding growth this subsector has enjoyed.

Figure 3: Aircraft deliveries (2009 to 2034F)



Source: Deloitte Touche Tohmatsu Limited (DTTL) Global Consumer & Industrial Products Industry group analysis of the following data: The Boeing Company, *Current Market Outlook (2015–2034)*, November 2015, http://www.boeing.com/resources/boeingdotcom/commercial/about-our-market/assets/downloads/Boeing_Current_Market_Outlook_2015.pdf; and Airbus Group, *Global Market Forecast (2015–2034)*, November 2015, <http://www.airbus.com/company/market/forecast/>.

Due to market growth, it is likely that new aircraft production programs may emerge from other developing regions. These new entrants may face challenges including obtaining sales orders from established large carriers, possible budget and schedule over-runs in product development, and delays in establishing a track record of reliable, safe, and trouble-free operation which takes time. However, given the demand for new aircraft over the next 20 years, new entrants are likely to eventually experience some level of sales and production success.

Another challenge faced by the aerospace supply chain is the ability to keep pace with OEM customers, which requires them to dramatically increase the production rate of components, systems, and services. Over the past decade, many aerospace suppliers have successfully met customers' challenges by changing their business model. Examples include investing in non-recurring research and development for new aircraft production programs, hiring design engineering staff to produce detailed designs for parts, investing in tooling for manufacturing, and directly managing a cadre of lower tier suppliers. However, many aerospace suppliers have struggled

to meet challenges related to the changed pricing and volume expectations, parts shortages, defects, unplanned overtime, and investment requirements.

It is likely that the aerospace supply chain will continue to transform and will likely consolidate further. Some smaller companies may not be able to afford to invest in the industry going forward. The trend to consolidate by part family (i.e., components, aero-structures, electronics, interiors, etc.) may continue for the next few years in order to gain economies of scale and to provide the required investment in people and tooling. As the continued demand of the flying public for lower fares ripples through the value chain—from OEMs to tier-one suppliers and on down—competitive pricing in the supply chain is anticipated to be an ongoing challenge in 2016.

Despite these challenges and given the production rate increases, it is estimated that 2016 will experience 3.4 percent growth in commercial aerospace subsector revenues, based on forecasts of the aircraft manufacturers and several investment analyst reports.¹⁶



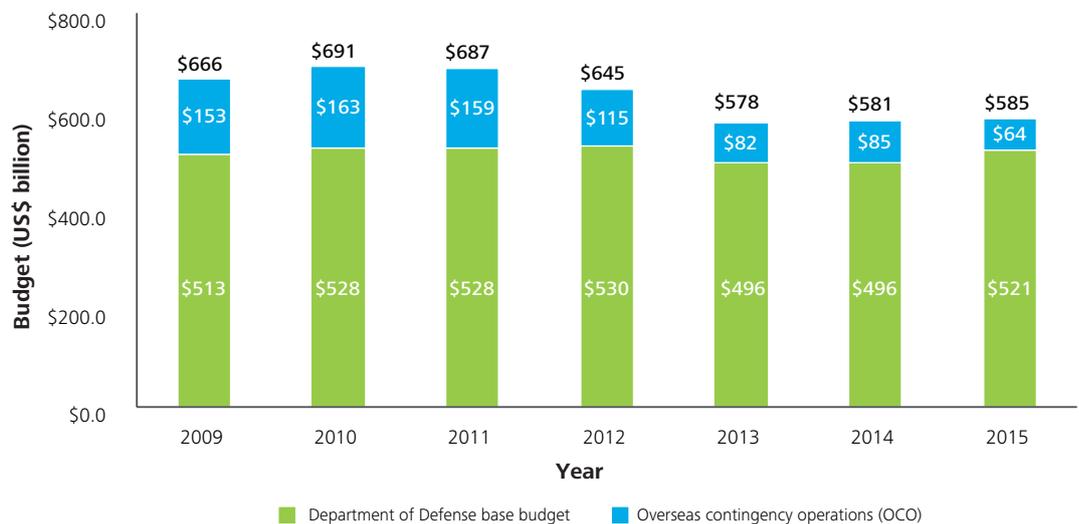
Defense subsector outlook

Key factors for declines in defense subsector revenues over the past four years include the cessation of a prolonged period of armed conflict in Iraq and Afghanistan, as well as the US Department of Defense (DoD) budget cuts. However, the five-year downturn in military expenditures in the US due to the 2011 Budget Control Act (BCA) has been moderated by the Bipartisan Budget Act of 2013 and again by a similar Congressional action in late 2015. It is expected that defense spending, which has declined in the US, will likely bottom out and enter a new growth cycle starting in 2016. Of course, future budget increases will depend on continued bipartisan agreement to reduce or eliminate the effects of the sequestration brought about by the US BCA. This will also depend on follow-through actions to increase the defense budgets of impacted countries facing sovereign security threats.

International demand for defense and military products is increasing as uncertainties brought on by regional tensions in the Middle East, Eastern Europe, North Korea, and the East and South China Seas may lead to increases in defense budgets. Specifically, the United Arab Emirates (UAE), Saudi Arabia, India, South Korea, Japan, India, China, Russia, and other affected governments are already starting to increase purchases of next generation military equipment.

Figure 4 illustrates the US DoD budgets from fiscal year (FY) 2008 through to FY2016, showing a five-year decline from FY2010 to FY2015, with an increase of US\$13.0 billion in FY2016, inclusive of Overseas Contingency Operations (OCO) funding.

Figure 4: U.S. Department of Defense budget in US\$ billion (fiscal year 2008 to fiscal year 2017)

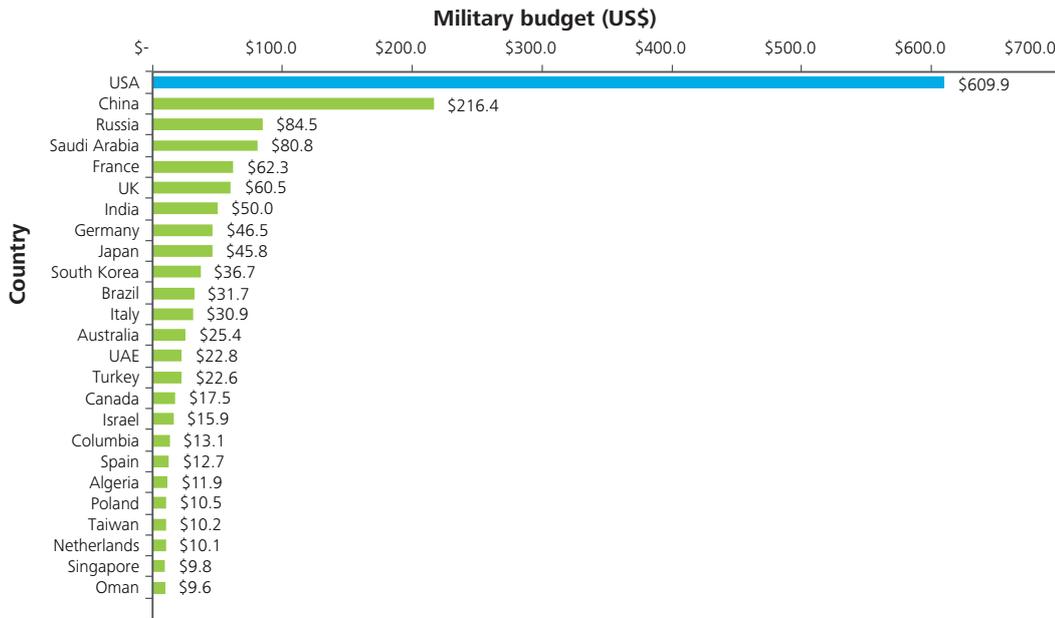


Source: Deloitte Touche Tohmatsu Limited (DTTL) Global Consumer & Industrial Products Industry group analysis of the data from the Office of the Under Secretary of Defense (Comptroller) in the United States, accessed in November 2015, <http://comptroller.defense.gov/>.

Figure 5 illustrates the top 25 military spending nations in the world. The US is the largest spender, accounting for 34.0 percent of the total global military spend of US\$1,747 billion in 2014.¹⁷ Also, note that in Figure 6

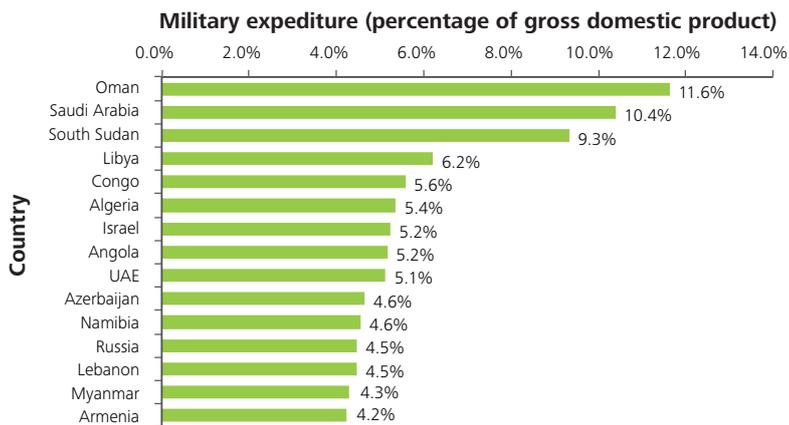
several Middle East and African countries are included in the top tier list of countries who spend a higher percentage of their GDP on military expenditures, with Oman and Saudi Arabia topping the list.

Figure 5: Top military spending nations 2014 (US\$ billion)
Total spend is US\$1,747 billion



Source: Deloitte Touche Tohmatsu Limited (DTTL) Global Consumer & Industrial Products Industry group analysis of data from Stockholm International Peace Research Institute (SIPRI) Military Expenditure Database, accessed in November 2015, http://www.sipri.org/research/armaments/milex/research/armaments/milex/research/armaments/milex/milex_database.

Figure 6: Military expenditure as a percentage of gross domestic product 2014



Source: Deloitte Touche Tohmatsu Limited (DTTL) Global Consumer & Industrial Products Industry group analysis of data from Stockholm International Peace Research Institute (SIPRI) Military Expenditure Database, accessed in November 2015, http://www.sipri.org/research/armaments/milex/research/armaments/milex/research/armaments/milex/milex_database.





For the global defense subsector, there is likely a return to growth in 2016. As the largest customer of the subsector, the US DoD will likely drive defense contractor revenues through budget increases of US\$13 billion in FY2016, growing the subsector by an estimated 2.7 percent during the year.¹⁶

With escalating global tensions, military actions, and national security threats, what can defense contractors expect in 2016?

2015 was a pivotal year that saw heightened tensions between China, its neighbors and the US over “island building” in the South and East China Seas, and the related claims of sovereign ocean territory rights by China. In addition, Russia and the Ukraine are at odds related to Russia’s takeover of Crimea and their military actions in Eastern Ukraine. North Korea continues to threaten its neighbors with its nuclear ambitions and aggressive rocket launches. The Islamic State (ISIS) has become a key threat in Syria, Iraq, and Afghanistan and is involved in exporting terrorism to Europe, Africa, and elsewhere. The recent tragic bombings in Paris, Beirut, Mali, the Sinai Peninsula, and other places have emboldened nations to join in the fight against terrorism.

Several governments affected by these threats are increasing their defense budgets to combat terrorism and address sovereign security matters, including cyber-threats. For defense contractors, this represents an opportunity to sell more equipment and military weapons systems. Products, which are expected to experience renewed interest from buyers, include armored ground vehicles, ground attack munitions, light air support aircraft, intelligence, surveillance and reconnaissance electronic sensors, cyber protections, maritime patrol ships and aircraft, as well as provision for equipment maintenance and sustainment, as the military operations tempo is likely to increase and more missions are executed.

It is expected that a return to growth for defense subsector companies will likely occur, due to the increased interest by several involved nations as described above. In addition, many large, mainly US DoD defense programs representing billions of US dollars, are likely to start soon, enter the engineering manufacturing design phase, and reach low-rate or full-scale production over the next few years. These programs include Ohio Class Submarine replacement, F-35 fighter jet, KC-46A aerial refueling tanker, Long Range Strike Bomber, USAF

T-X trainer, and Rafale fighter programs. Please refer to the “End notes” section for details.

Where will defense companies focus their attention in order to grow revenues?

In addition to growing revenues, many defense firms will likely seek to grow via foreign military sales, acquisitions, and through new product introductions. As described above, large-scale domestic programs are likely to find increased success in selling into foreign markets. Indeed, many defense companies have increased the percentage of sales to foreign governments. In the US alone, foreign military sales increased from US\$21.36 billion in FY2010 to a record US\$46.6 billion in FY2015, a 118.2 percent growth.¹⁸ It is likely that this trend will continue for not only US-based defense firms, but also European and Asian firms.

A second avenue for revenue growth will be acquisitions. As the defense subsector has contracted over the last few years and as U.S. DoD and global Ministry of Defense (MoD) budgets decreased, there have been many acquisitions due to subsector contraction and diminishing work to support defense employment. Several companies—particularly those in the government services businesses—were divested by prime defense contractors, with some degree of combinations occurring in order to gain economies of scale. In addition, there have been mergers and acquisitions in the space subsector, as the industry becomes more fluid with the introduction of new, privately financed companies that create a dynamic competitive landscape.

Lastly, it is expected that defense companies to continue developing new innovative technologies that meet warfighter requirements. This will continue to be a challenge in the US as the DoD has significantly reduced its research, development, test, evaluation investment account by 21.1 percent¹⁹ over the last five years and company funded independent research, and development has decreased 26.5 percent²⁰ over the same period. Nevertheless, there are several examples of innovative technologies being internally funded and developed by visionaries outside of the traditional DoD weapons systems acquisition process, who see opportunities to create new markets. This will involve risk-taking, investment funding, executive leadership, and commitment. Look for some of these global companies and their products to find commercial success in 2016.

Will the slower economic growth in China affect the commercial aerospace subsector?

China is expected to continue to be one of the largest markets for commercial aircraft delivery over the next 20 years. Aircraft deliveries to China are forecast to increase from 2,570 units in 2014 to 7,210 units in 2034, representing a 20-year growth of 180.5 percent.²¹ Although China’s economic slowdown has raised questions about the potential effect on aircraft deliveries, in just the last three years, China has ordered an estimated 784 aircraft,²² demonstrating the robustness of the market despite the economic slowdown.

However, it is anticipated that the continued strength in the commercial aerospace market in China will not be materially impacted by the economic slowdown. This is in part because of the reduced cost of flying due to the lower oil prices, continued demand for passenger travel for leisure and business, and government support for the industry. As airlines operate with sustainable profitability, ticket prices are declining over time on an inflation-adjusted basis, making flying more affordable to millions of people and attractive for new air travelers in the domestic market.

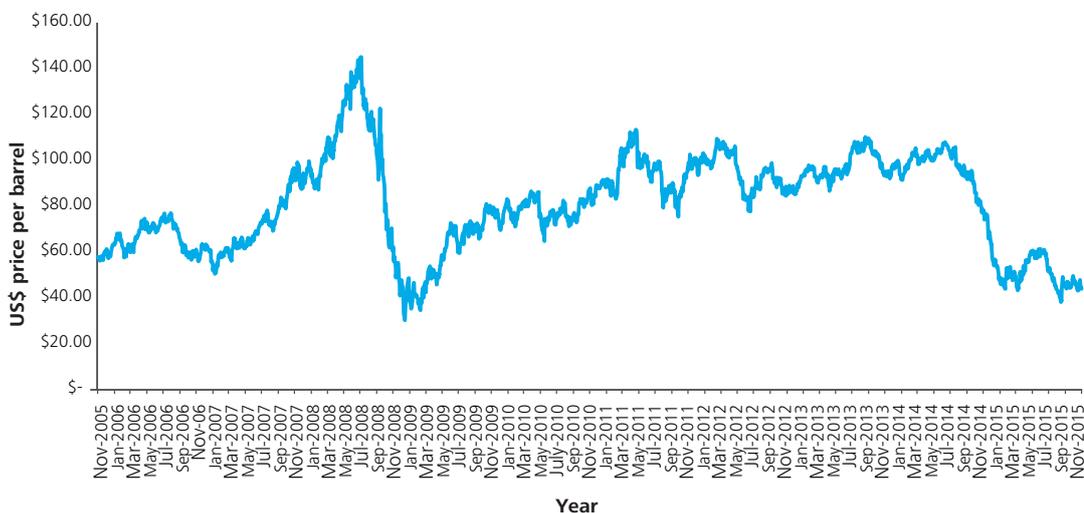
China’s expanding transportation infrastructure offers growth opportunities for commercial aerospace companies. The Chinese government, for example, plans to increase its number of airports from 200 in 2015 to 240 by 2020.²³ In addition, the Chinese government continues to support the commercial aircraft subsector, both as a supplier to European and US manufacturers, but also to their growing indigenous industry.

How might a continued fall in oil prices affect aircraft sales?

Jet fuel constitutes a large portion of the operating costs for commercial airlines. Indeed, fuel costs as a percent of total aircraft direct operating costs have fallen from 36 percent to 28 percent of flying an aircraft between 2008 and late 2015, due to oil price deflation.²⁴ This, in turn, has boosted the profits of a majority of the global airline operators, allowing them to reduce ticket prices in selected markets. As airlines become more profitable, their balance sheet strength allows more flexibility to upgrade aircraft to next-generation more fuel-efficient models. Although the business case for aircraft model upgrades decreases when the price of oil decreases, airlines typically find that a newer fleet can help them to be more competitive owing to lower life cycle costs of maintenance while responding also to customer preference. It also provides a hedge in case oil prices increase, which many economists expect will eventually occur.

As illustrated in Figure 7, oil prices have experienced a dramatic decline by more than 50 percent²⁵ since early 2014, primarily due to increased domestic production of crude oil in the US, conservation, and a global economic slowdown in key oil consuming economies. In November 2015, the global inventory of oil reached record levels as the US industry has not appreciably reduced production and other oil-producing countries continue to supply oil at a record pace. At the same time, slower growth in Europe, Japan, China, and other emerging economies has led to a decline in oil consumption. Consequently, according to the OPEC’s Monthly Oil Market Report published in November 2015, for the first three quarters of 2015, global oil inventories saw a strong build of around 285 million barrels or 1.0 million barrel per day. The buildup in global inventories is primarily because of the increase in total supply outpacing growth in world oil demand.

Figure 7: Cushing, West Texas Intermediate Oklahoma spot price (US\$ per barrel) (2005 to 2015)



Source: Deloitte Touche Tohmatsu Limited (DTTL) Global Consumer & Industrial Products Industry group of data from U.S. Energy Information Administration (EIA), accessed in November 2015, <http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PETGs=rwtc&f=D>.

What is the likely impact of the strong US dollar on the global A&D sector in the near future?

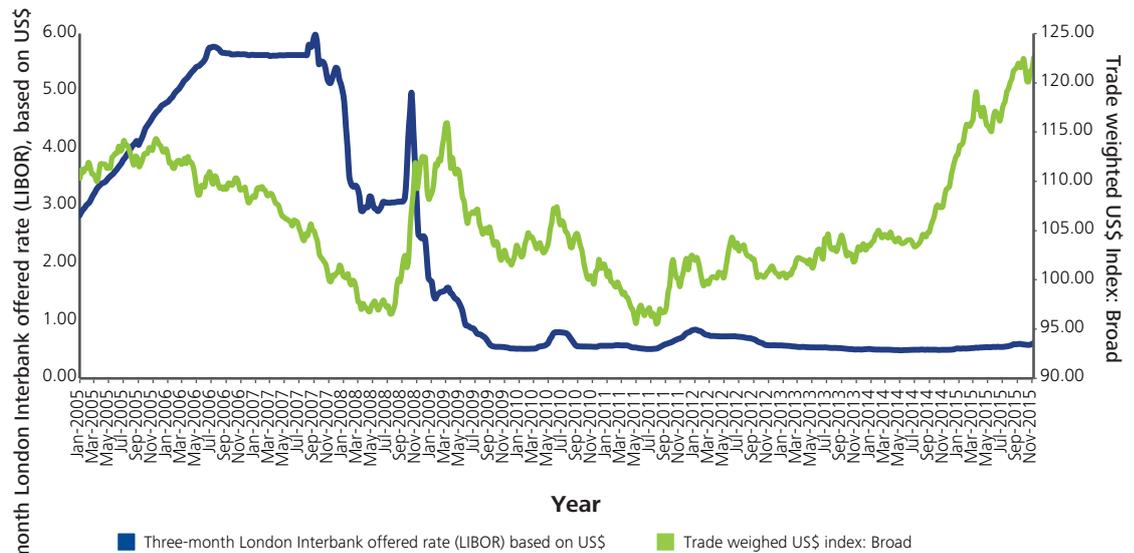
The recent strengthening of the US economy, slower global growth, and expectations about additional policy rate hikes from the US Federal Reserve, has led to an appreciation of the US dollar. Since July 2014, the real trade-weighted currency has appreciated 14 percent²⁶ and has exporters concerned that it may decrease their competitiveness in the global A&D market. Furthermore, businesses anticipate further strengthening of the US dollar in 2016 and, consequently, are rethinking their capital spending plans.²⁷ Figure 8 illustrates the dramatic increase in the trade weighted US index value since mid-2011.

The A&D sector in the US is sensitive to the movements in the US dollar in two ways. First, due to the growing reliance of the sector on international trade, sector revenue is impacted as a stronger dollar pushes

up prices of US A&D products making exports less competitively priced in the global market. Second, as US imports become relatively more expensive, (non-US) domestic A&D manufacturers may likely capture more local demand.

On the other hand, it should be noted that US exports of sector products have dramatically increased over the same period, a somewhat counterintuitive finding. Indeed, A&D products continue to be the number one exporting sector for the US. The volume of sector gross exports has increased from US\$89.1 billion to US\$135.8 billion from 2010 to 2014, representing a 52.4 percent increase.²⁸ In addition, it should be noted that, on a global basis, commercial aircraft are sold in US dollars, whether they are sourced in the US or from Europe. Thus, a strong dollar may make aircraft more expensive to global customers, but it does not make US commercial aircraft more expensive versus European aircraft.

Figure 8: Trade weighted US\$ index and three-month London Interbank offered rate (LIBOR) (2005 to 2015)



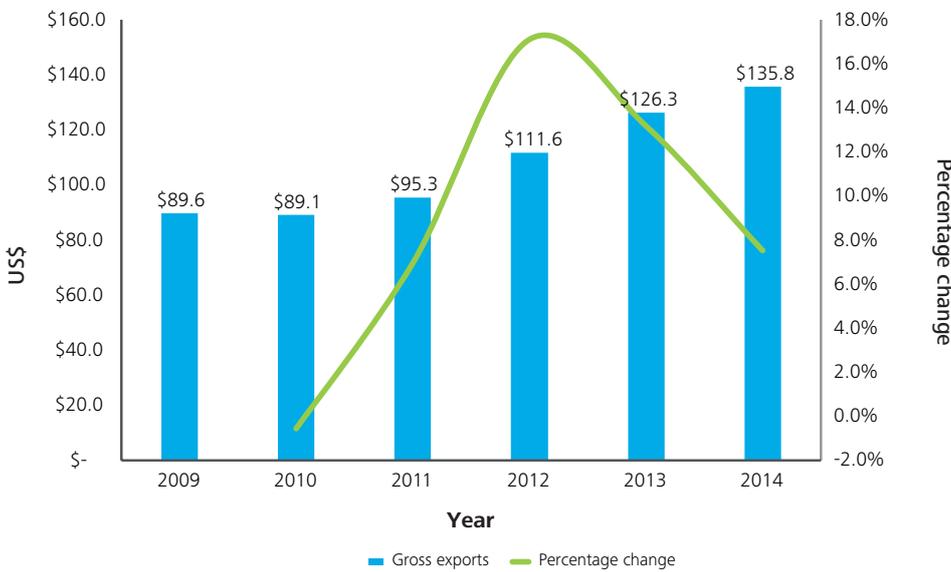
Source: Deloitte Touche Tohmatsu Limited (DTTL) Global Consumer & Industrial Products Industry group of data from Federal Reserve Bank of St. Louis, accessed in November 2015, <https://research.stlouisfed.org/fred2/series/TWEXB/downloaddata> and <https://research.stlouisfed.org/fred2/series/USD3MTD156N>.



Figure 9 illustrates the increase in US gross exports of A&D sector products from 2010 to 2014. The countervailing forces of a strong dollar, with the competitive strength of US products in the global marketplace, are expected to create some uncertainty

in 2016. However, as stated earlier, commercial aircraft sales and production volumes are expected to increase. In addition, military products and weapons systems sales are expected to increase globally, as defense budgets rise with growing global tensions and military actions.

Figure 9: U.S. aerospace and defense sector gross exports in US\$ billion (2009 to 2014)



Source: Deloitte Touche Tohmatsu Limited (DTTL) Global Consumer & Industrial Products Industry group analysis of data from the U.S. Census Bureau, accessed in November 2015, www.census.gov/; and UN Comtrade | International Trade Statistics Database, accessed in November 2105, www.comtrade.un.org/.

Is the sector becoming more efficient?

The A&D sector continues to improve its productivity and efficiency due to several initiatives taking hold over the last several years. Companies have improved their performance in reducing inventories, rationalizing their asset footprint, better managing their supply chain, and increasingly replacing labor with process automation on the factory floor. In addition, the transition of paper drawings to computer-aided design has brought a significant leap in employee productivity. Digital product development allows the entire product to be designed and tested in the computer, without the need for costly physical mockups. For example, the modeling and

simulation allowed by digital product development significantly reduces design flow time, tolerance buildup, and engineering errors.

US companies have experienced more recent success in improving employee productivity compared to companies in Europe and Asia due to its greater flexibility to rationalize factories, adjust employee levels, and manage their cost structure in a timely manner. Figure 10 shows the gap between US productivity and the rest of the world, where US headquartered companies experienced a 5.5 percent average annual growth rate improvement in operating earnings per employee from 2010 to 2015E, over the 3.6 percent

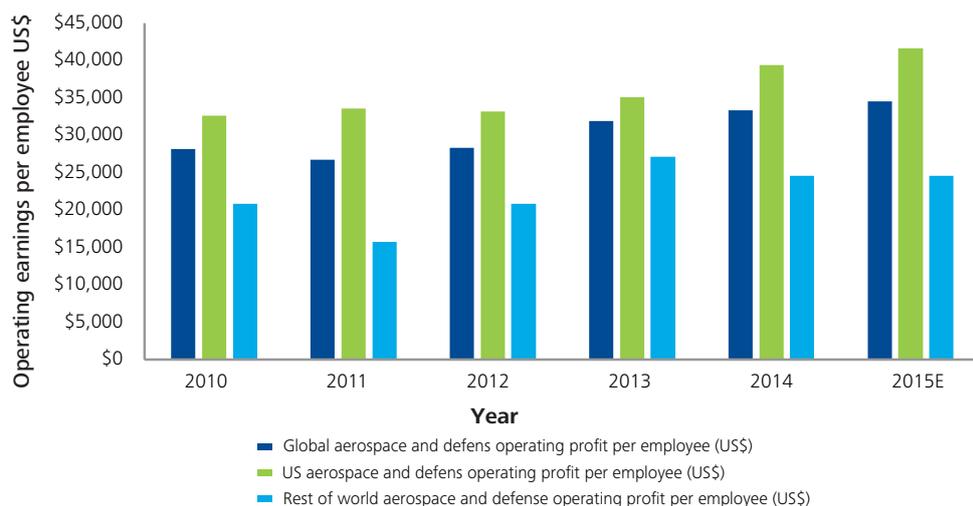


improvement for the rest of the world during the same period.²⁹ In a more focused comparison, the average operating margin for US companies in 2014 was 10.9 percent, while European companies experienced operating margins of 7.2 percent.³⁰

Continued productivity improvement in engineering and manufacturing operations continues to be a

key element allowing flexibility in pricing products. Customers—whether airlines or government defense procurement officials—continue to expect more for less: more functionality, less cost for maintenance, lower acquisition prices, and better, more competitive products. The global A&D sector is expected to continue to experience pricing pressure and a resulting need to be more efficient and to reduce costs in 2016.

Figure 10: Global, U.S., and rest of the world operating earnings per employee in US\$ (2010 to 2015E)



Source: Deloitte Touche Tohmatsu Limited (DTTL) Global Consumer & Industrial Products Industry group analysis of aerospace and defense annual reports for 2010, 2011, 2012, 2013, 2014 and quarterly reports for 2015 and information from DTTL's annual *Global A&D sector financial performance study* for the years 2011, 2012, 2013, 2014, and 2015.

What are the trends affecting growth in the UK A&D market?

The recently published *2015 Strategic Defence and Security Review (SDSR)* was widely seen in the UK as a positive step towards clarifying the UK's strategic security and defense priorities and providing long term stability for defense businesses.³¹ The SDSR process itself was quite innovative in that it appears to have led to some genuine trade-offs being made across defense and security to deliver a "full spectrum approach." This has resulted in an additional £12 billion of funding over the next ten years to the equipment and support.³²

This funding will support many initiatives, including the acquisition of nine new Boeing P-8 maritime patrol aircraft, continued investment and international collaboration in unmanned combat air system and complex weapon programs, an acceleration of the procurement of 138 F-35 combat aircraft, alongside a £1.9 billion investment over the next five years in the UK's intelligence and cyber capabilities.³³ Aside from these measures to address existing capability shortfalls, the UK Government confirmed its long-term commitment to the Astute, Successor, and Type 26 maritime programs.³⁴



In the commercial aerospace subsector, the UK continues to enjoy a record backlog of orders across narrow- and wide-body aircrafts, but the supply chain to deliver on these orders is an increasing challenge. This is becoming more acute for tier two suppliers and below highlighting the importance of continued investment in plant, machinery, and know-how to sustain the UK's competitiveness against the backdrop of fierce international competition. What will become critical over the next decade for UK businesses is a repositioning of their export ambitions to the increasingly affluent Asia-Pacific region that is set to overtake the North American market demand for commercial aircraft. Undoubtedly, this will likely require UK businesses to consider acquiring new customers and forming new alliances and partnerships, initiatives, which the UK government has clearly committed through the establishment of a £1.9 billion Prosperity Fund.³⁵

What trends are affecting the France A&D market?

In the French A&D sector, air traffic control in the National Airspace is gaining attention. Airspace challenges in Western Europe are exacerbating the need for a more efficient and improved air transport system. Under the guidance of Eurocontrol, the introduction of sophisticated information systems are designed to optimize airspace management, but security and system integration complexities will affect progress in the near future. Improvements in system design with the interconnection between ground control systems and aircraft are a high priority due to cyber security threats.

In the commercial market, aircraft fleet management optimization will be critical to help limit aircraft stopover and maintenance time, accelerate rotations, and boost the number of passengers. Crucial to this drive will be the real-time in-flight transmission of flight status. One solution currently discussed is the need for aircraft-to-ground downlinks to diagnose a required interface, with the caveat of taking into account flight security challenges to the ever-present possibility of terrorist attacks requiring targeted and effective intelligence plans and actions. This includes linking diversified data sources and big data analytic approaches that will play a role in detecting the most relevant signals.

For defense, European military forces are experiencing a gap with US capabilities and face the challenge of making the best use of technologies, in order to enhance their intelligence autonomy and accuracy. Finally, unmanned aerial vehicles are seen as a technological game changer in the industry, whose regulation is being spearheaded in France prior to a European implementation in the near future.

Mergers and acquisitions activity will continue in the A&D market due to consolidation in certain segments, including aerostructures and, more broadly, small to mid-size subcontractors. If the Euro exchange rate is low, European companies are likely to see an improvement in their operating margins and their ability to invest. Commercial aerospace demand continues to be driven by high-growth economies, where French companies have a strong incentive to invest, often through offsets or joint ventures. Faced with declining budgets, the defense subsector has started to rationalize its activities, dispose of non-core activities and even join forces with peers to increase competitiveness.

What is the forecast for India's defense sector?

India's defense sector offers significant opportunities for defense manufacturing firms. Currently, India employs the third largest armed forces in the world and sources an estimated 60.0 percent of its defense requirements through imports.³⁶ For fiscal year 2015 to 2016, India's defense budget was US\$40.4 billion, an increase of nearly 8.0 percent over the previous year, and the defense budget will likely continue to increase at a similar rate of growth over the next five years.³⁷

To make the country an attractive manufacturing destination, the Indian government is encouraging investments in the defense sector by opening up the sector for private companies. Foreign defense contractors are now able to enter into joint ventures with Indian private companies, which will help support the development of a sustainable supplier base for the defense sector. Foreign direct investment up to 49.0 percent is allowed from an earlier cap of 26.0 percent. An earlier clause requiring a single Indian company to own a minimum of a 51.0 percent equity stake has been eliminated, enabling foreign companies to do business in



India more easily.³⁸ Entry of foreign defense companies into India will likely require technology transfer and aid in supporting a high quality indigenous supplier base. As part of those efforts, the government has relaxed their offset policy for placing value in the country.

The current offset policy stipulates that defense companies be required to procure a minimum of 30.0 percent from local suppliers for any defense equipment valued more than US\$50 million. The market for defense offset obligations itself is expected to result in investments of an estimated US\$4 billion over the next eight years.³⁹

To make it easy for private companies to participate in the “Make in India” initiative, the government has granted licenses for many private companies to manufacture products for the defense sector. For instance, in October 2015, the Department of Industrial Policy and Promotion (DIPP) granted permission to 19 private companies⁴⁰ to manufacture defense products such as simulators for the armed forces, ammunition, tanks, off road military vehicles, and hovercraft, among others. Encouraged by the opportunity, some Indian companies, which are new to the defense sector, have created defense subsidiaries and have entered into joint ventures with foreign companies for homeland security systems. Consequently, private participation in defense contracting will likely increase significantly over the next few years.

Will Middle East countries be able to afford new weapons systems due to the fall in oil prices?

Over the past decade, prior to the recent period of lower oil prices and buoyed by previous record high oil prices, commercial and defense customers from the Middle East—especially the Gulf Co-operation Council (GCC)—increased spending on advanced commercial aircraft and military equipment. Specifically, higher oil prices and strong cash positions enabled GCC countries to undertake multi-billion dollar defense modernization programs, aimed at equipping militaries with sophisticated weaponry. For example, Saudi Arabia spent US\$80.8 billion on defense in 2014, or 10 percent of its GDP, making it among the top five largest defense-spending countries in the world.⁴¹ Higher oil

prices helped Saudi Arabia increase its defense spending by 112.0 percent over the past decade.⁴² Similarly, the UAE spent US\$22.8 billion or 5.7 percent of its GDP on defense, featuring it among the top 15 largest military spenders globally.⁴³

However, lower oil prices are likely to affect the cash reserves of these GCC countries and their spending on defense going forward. Even as countries such as the UAE diversify their economies away from oil and toward services, major GCC economies like Saudi Arabia are expected to be more vulnerable to falling oil prices, with oil revenues accounting for an estimated 90.0 percent of government revenue.⁴⁴ Furthermore, many major global economies are reducing their dependence on oil and gas imports from the Middle East. For instance, the US has a focus on local shale oil extraction, Europe is investing significantly in green electricity, and China is focusing more attention on nuclear energy production—all of which may portend a longer period of low oil prices.

This represents a potential challenge to the global defense subsector since Middle East governments are major customers of the defense contractors from the US and Europe. Moreover, the region played a crucial role as a customer of US and European weapons systems, just as defense spending declined in the US and Europe in the aftermath of the global financial crisis of 2008 and 2009. However, the ongoing hostilities in Iraq, Afghanistan, and Syria, coupled with events in other geopolitical hotspots such as Yemen and Libya, will likely keep the demand for defense equipment and security capabilities strong from the Middle East in the near future. Saudi Arabia, UAE, and other GCC countries are expected to keep the order flow strong for combat aircraft, aerial-refueling planes, transport aircraft, ground-based air defense, and combat vehicles to fight terrorism and extremists over the next few years.

Explain what mergers and acquisition (M&A) activity is expected to occur in 2016 and beyond

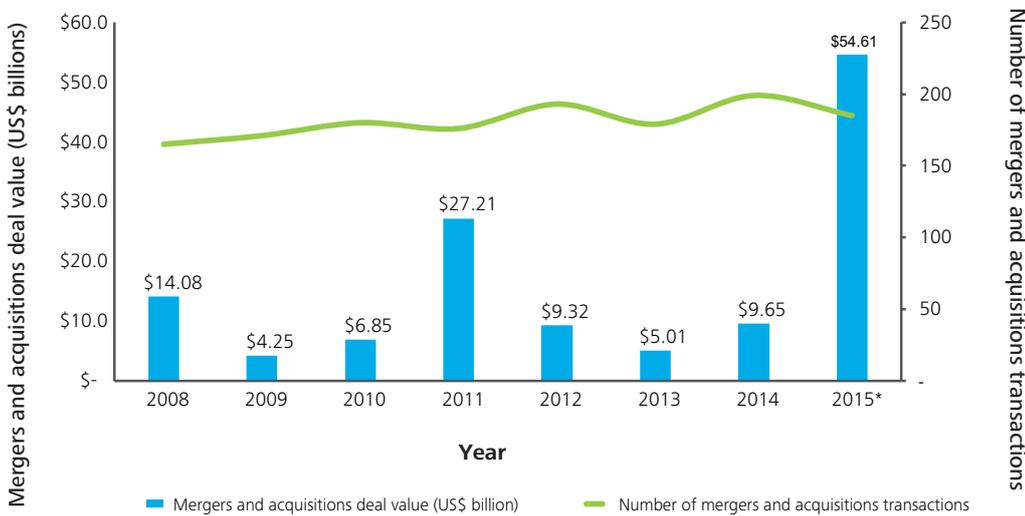
Global M&A deal value in the A&D sector reached its highest level ever in 2015. The sector recorded M&A deals worth US\$54.6 billion in 2015 (YTD from 1 January to 25 November 2015), compared to US\$14.1 billion in 2008, which represents a 288.0 percent increase over

the 2008 value.⁴⁵ Similarly, deal volume or number of deals increased 12.1 percent to 185 transactions in year-to-date (YTD) 2015 compared to 165 transactions in 2008.⁴⁶ The A&D sector saw two landmark transactions in 2015: Berkshire Hathaway's US\$35.8 billion deal to acquire the remaining 96.9 percent interest in Precision Castparts Corp. (the largest deal in A&D history) and Lockheed Martin's US\$9.0 billion acquisition of helicopter manufacturer Sikorsky from United Technologies.⁴⁷

Favorable interest rates and relatively easier access to

financing supported deal making in the commercial aerospace market. Strong demand for commercial aircraft also bolstered deal activity, as airlines aimed to meet rising global passenger travel demand. In addition, private equity firms invested in aircraft parts companies to make inroads into the growing global commercial aviation segment. Figure 11 illustrates global M&A volume and deal activity from 2008 through November 2015.

Figure 11: Global aerospace and defense sector mergers and acquisitions activity (2008 to 2015)



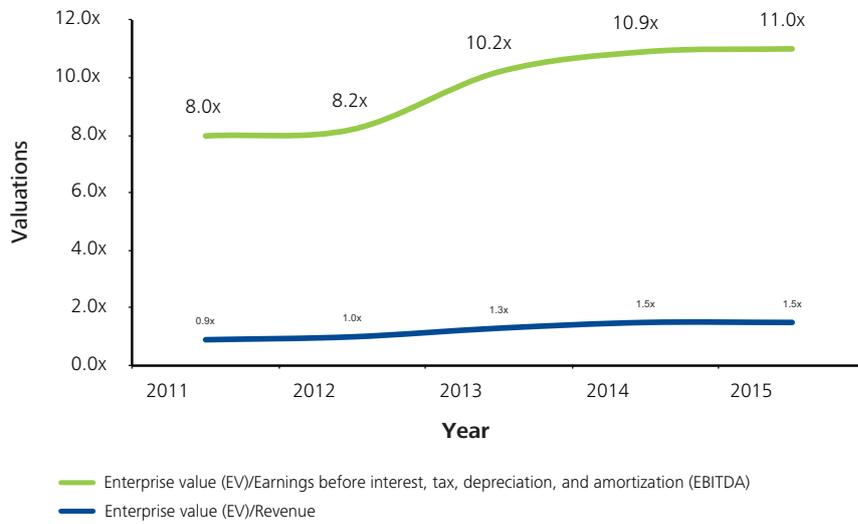
Source: Deloitte Touche Tohmatsu Limited (DTTL) Global Consumer & Industrial Products Industry group analysis of data from Thomson Reuters. Data is through 25 November 2015.

In 2016, it is likely that A&D companies will continue to rationalize their product portfolios through restructuring, divestiture, and spin-offs. For example, Lockheed Martin has announced a plan to divest or spin off US\$6 billion worth of government information technology, infrastructure services, and technical services business in 2016.⁴⁸ Deal activity in commercial aerospace is expected to remain strong, especially for component manufacturers, as airlines continue to shift to more advanced aircraft and build their fleets to meet demand in growth markets such as Asia, the Middle East, Eastern Europe, and Latin America. Moreover, defense

contractors may consolidate to spur growth, offsetting declining revenues due to sluggish defense spending.

The valuations of A&D companies as a whole are increasing significantly, because of continued improvements in financial performance and expectations of growth. Specifically, the average price earnings (P/E) ratio is now 39.4 percent higher than it was five years ago.⁴⁹ Figure 12 illustrates the increase in enterprise value on both an earnings before interest, tax, depreciation, and amortization (EBITDA) and revenue basis.

Figure 12: Global aerospace and defense sector valuations (2011 to 2015)



Source: Deloitte Touche Tohmatsu Limited (DTTL) Global Consumer & Industrial Products Industry group analysis of data from CapitalIQ, accessed in November 2015.

How did the global A&D sector perform in terms of shareholder return?

Driven primarily by improved profitability, free cash flow, return on invested capital, and future expectations of growth, the key A&D sector indices (including the US based S&P A&D select index and the European

STOXX Europe total market A&D index) continued to outperform the broader market. Figure 13 illustrates just how well the sector has performed in equity price appreciation compared to these other indices—a 622 percent improvement for the S&P A&D select index in the last 15 years, compared to a 39 percent improvement for the S&P 500 index.⁵⁰

Figure 13: Global aerospace and defense sector indices' performance (2000 to 2015)

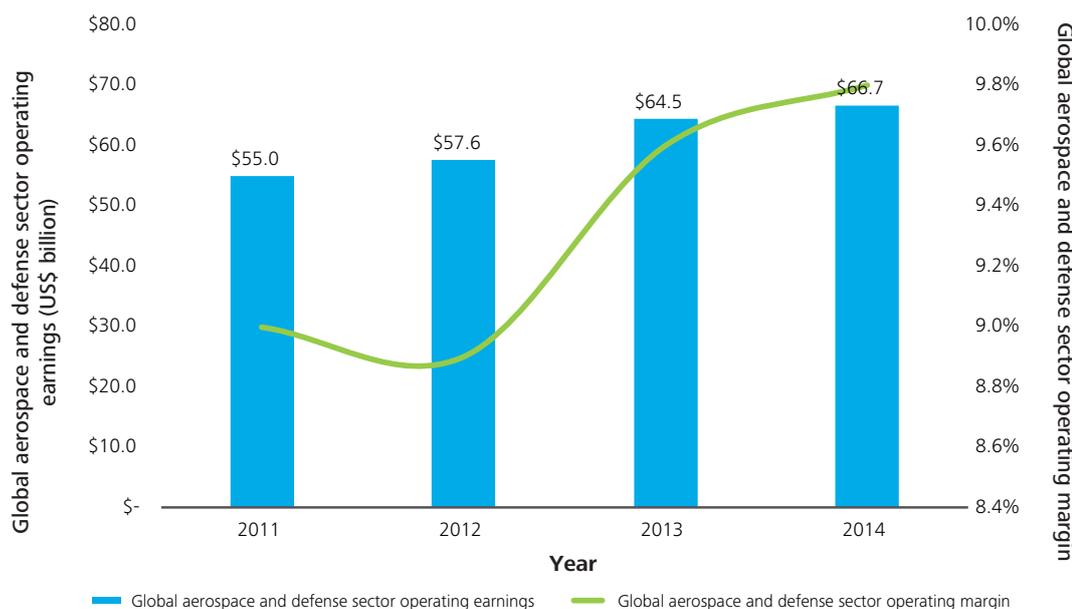


Source: Deloitte Touche Tohmatsu Limited (DTTL) Global Consumer & Industrial Products Industry group analysis of data from Bloomberg, accessed in November 2015.

The global A&D sector continues to experience improved operating efficiencies, resulting in higher earnings and operating margins. The sector's operating margins have been improving over the past several years, growing 8.4 percent in 2012, 9.6 percent in 2013, and 9.8 percent in 2014.⁵¹ A&D sector customers, which includes airlines, passengers, defense departments of individual countries,

are likely obtaining more value for their monies, thus creating financial value for shareholders. Many defense contractors have focused on internal cost-cutting and, as a result, returned cash to shareholders having boosted share prices. Figure 14 illustrates the improvement in financial performance since 2011, showing increased operating profits as well as operating margins.

Figure 14: Global aerospace and defense sector operating earnings and margin (2011 to 2014)



Source: Deloitte Touche Tohmatsu Limited (DTTL) Global Consumer & Industrial Products Industry group's 2015 Global aerospace and defense sector financial performance study, June 2015.

What has been the financial performance of major A&D companies during the first nine months of 2015?

As seen in Figure 15, the top 20 global A&D companies reported combined revenues of US\$353.3 billion during the first nine months ending September 2015, which represents a year-over-year decline of 1.5 percent.⁵² Operating earnings for the top 20 global

A&D companies grew by 2.9 percent to US\$38.7 billion during this timeframe, despite the decrease in top line revenues.⁵³

Looking at a subset on the other hand, the top 20 US based A&D companies' revenues grew by 0.4 percent to US\$270.1 billion during the same period.⁵⁴ In addition, their operating earnings increased by 3.7 percent to US\$33.9 billion.⁵⁵

Figure 15: Top 20 global and US aerospace and defense companies' financial performance (2015 and 2014*)

Top global aerospace and defense companies	Nine months ending September 2015	Nine months ending September 2014	Percentage change
Revenues (US\$ billion)	\$353.3	\$358.6	-1.5%
Operating earnings (US\$ billion)	\$38.7	\$37.6	2.9%
Operating margin	11.0%	10.5%	4.5%
Top 20 U.S. aerospace and defense companies	Nine months ending September 2015	Nine months ending September 2014	Percentage change
Revenues (US\$ billion)	\$270.1	\$269.0	0.4%
Operating earnings (US\$ billion)	\$33.9	\$32.7	3.7%
Operating margin	12.6%	12.2%	3.2%

* Years include nine months ending September 2015 and September 2014.

Source: Deloitte Touche Tohmatsu Limited (DTTL) Global Consumer & Industrial Products Industry group analysis of the companies' quarterly reports and 10-Q statements for the companies mentioned in the DTTL study entitled 2015 Global A&D sector financial performance study, November 2015.

As illustrated in Figure 16, aggregate revenues for the top 20 global defense companies reported a 3.2 percent decline to US\$177.8 billion in the nine months ending September 2015, versus US\$183.7 billion during the same period in 2014.⁵⁶

The top 20 US based defense companies reported a 1.0 percent decline in revenues during the nine months ending September 2015, indicating continued sluggishness in defense spending.⁵⁷

The commercial aerospace subsector continued to report growth, with both the top 20 global and the top 20 US companies reporting 0.3 percent and 2.4 percent increases in revenues, respectively.⁵⁸

Figure 16: Top 20 global and U.S. aerospace and defense companies - Commercial aerospace versus defense subsector financial performance (2015 and 2014*)

Financial performance		Nine months ending September 2015	Nine months ending September 2014	Percentage change
Revenues (US\$ billion)				
Top 20 global aerospace and defense companies	Commercial aerospace	\$175.5	\$174.9	0.3%
	Defense	\$177.8	\$183.7	-3.2%
Top 20 U.S. aerospace and defense companies	Commercial aerospace	\$115.9	\$113.2	2.4%
	Defense	\$154.2	\$155.8	-1.0%
Operating earnings (US\$ billion)				
Top 20 global aerospace and defense companies	Commercial aerospace	\$18.7	\$18.4	1.6%
	Defense	\$20.0	\$19.2	4.2%
Top 20 U.S. aerospace and defense companies	Commercial aerospace	\$15.4	\$14.9	3.4%
	Defense	\$18.5	\$17.8	3.9%

* Years include nine months ending September 2015 and September 2014.

Source: Deloitte Touche Tohmatsu Limited (DTTL) Global Consumer & Industrial Products Industry group analysis of the companies' quarterly reports and 10-Q statements for the companies mentioned in the DTTL study entitled *2015 Global A&D sector financial performance study*, November 2015.

Conclusion

The global A&D sector experienced a slowdown during the past twelve months. Following the decline in revenues in 2015, the A&D sector is expected to grow by 3.0 percent in 2016. This rebound will likely be driven by strong passenger traffic, continued demand for commercial aircraft from growing economies like India and China, expected recovery in the global military expenditure on account of growing tensions and instability in the Middle East, specifically, an increase in the U.S. DoD budget.

The two primary commercial aerospace OEMs continue to experience record backlogs on the back of solid demand for newer aircraft from the global airlines. This

optimism is further warranted, as oil prices remain a major comforting factor in boosting the growth and with the likely potential to positively influence the commercial aerospace subsector growth. Despite the program cutbacks, backlog in the defense subsector continues to be stable from a long-term perspective. In addition, with the US defense budgets seemingly bottoming out in FY2015 with an uptick in spending in FY2016, the global defense subsector is expected to end its multi-year decline in revenues. All this bodes well for the global A&D sector not only into 2016 but also over the next few years.

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End notes

Ohio Class Submarine replacement – The Navy began technology development in January 2011. Ship construction expected to begin in 2021 in order to build, test, and certify the lead ship prior to delivery in 2031. <http://www.senedia.org/wp-content/uploads/2014/09/Ohio-Replacement-Program-Defense-Innovation-Days-5-Sep-2014-Final.pdf>

F-35 fighter jet – Program started in 1996 with the development beginning in 2001. Full-scale production expected in 2018. <https://www.f35.com/about/fast-facts/cost>

KC-46A aerial refueling tanker – Development began in 2011 with first flight in September 2015. Low rate production expected in April 2016 (delayed from August 2015). <http://www.bloomberg.com/news/articles/2015-07-21/boeing-faces-eight-month-delay-on-3-billion-tanker-contracts>

Long Range Strike Bomber - The U.S. Air Force awarded a development contract in October 2015 to Northrop Grumman Corporation for delivering the new Long-Range Strike Bomber (LRS-B). Introduction of the first LRS-Bs expected in mid-2020. <https://www.fas.org/sgp/crs/weapons/IN10095.html>

USAF T-X trainer - T-X fighter trainer program is likely to begin in FY 2017 with initial operating capability in 2023/24. <https://www.flightglobal.com/news/articles/pentagon-proposes-buying-fewer-fighters-unmanned-aircraft-in-fy2015-396612/>

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