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Criteria | Corporates | Industrials:

Key Credit Factors For The Aerospace And Defense Industry

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*(**Editor's Note:** The criteria supersede "Key Credit Factors: Methodology and Assumptions On Risks In The Aerospace and Defense Industries" published June 24, 2009.)*

1. Standard & Poor's Ratings Services is refining and adapting its methodology and assumptions for rating the aerospace and defense (A&D) industry. We are publishing this article to help market participants better understand our key credit factors in this industry. This article is related to our global corporate criteria (see "Corporate Methodology," published Nov. 19, 2013) and to our criteria article "Principles Of Credit Ratings," which we published on Feb. 16, 2011.

2. These criteria supersede "Key Credit Factors: Methodology and Assumptions On Risks In The Aerospace and Defense Industries," published June 24, 2009.

SCOPE OF THE CRITERIA

3. By A&D companies, we mean those that derive a majority of their revenues from the design, manufacture, or repair of civil aircraft (i.e., jetliners, business jets, regional jets, general aviation aircraft, and helicopters) or supply related components or systems (including distributors of aircraft parts); design, manufacture, or service weapons systems or supply-related components; or provide defense-related services to government agencies or the military. (Firms that primarily provide government information technology (IT) services are covered under "Key Credit Factors For The Technology Software And Services Industry," published Nov. 19, 2013.)

SUMMARY OF CRITERIA UPDATE

4. Standard & Poor's is updating its global criteria for analyzing A&D companies, applying Standard & Poor's global corporate criteria.

5. We view A&D as an "intermediate risk" industry under our criteria, given its "moderately high" cyclicality risk and "intermediate" degree of competitive risk and growth. In assessing the competitive position of an A&D issuer, we put particular emphasis on: market position and growth prospects of its market segments, program diversity and priority (for defense contractors), product and end-market diversity, and operating efficiency. In our assessment of the financial risk profile, we consider leverage, cash flow generation, and management's policies on shareholder rewards and acquisitions.

IMPACT ON OUTSTANDING RATINGS

6. We do not expect these criteria, in and of themselves, to result in any rating changes.

EFFECTIVE DATE AND TRANSITION

7. These criteria are effective immediately.

METHODOLOGY

Part I--Business Risk Analysis

Industry risk

8. Within the framework of our criteria for assessing industry risk (see "Methodology: Industry Risk," Nov. 19, 2013), we view A&D as an intermediate risk industry (category 3). We derive this assessment for A&D from our view of the segment's moderately high (category 4) cyclicality, and our assessment that the industry warrants an intermediate (category 3) competitive risk and growth assessment.

9. The key drivers of cyclicality differ for the two subsectors of the A&D industry, commercial aerospace and defense, and we capture these differences in our assessment of each company's competitive position. Demand for jetliners, by far the largest component of the commercial aerospace industry, is derived from demand for global air travel, which is influenced by global GDP growth, trade, and increases in per capita wealth, especially in developing countries. The commercial aerospace industry has historically experienced fairly large peaks and troughs in end-market demand, as airlines over-order in economically favorable times and then cancel, causing significant production declines, in downturns. However, aircraft manufacturers have become more restrained about increasing production and currently have backlogs for some aircraft types that equal 6-8 years of production at proposed rates, perhaps limiting the depth of the next downturn. Business jet demand has historically been highly correlated with profit growth of U.S. corporations, the primary market, but increasing demand from other parts of the world--especially resource-dependent areas such as Russia and the Middle East, and, increasingly, wealthy Asian countries--has disrupted this relationship.

10. Although technically a duopoly, the market for large jetliners (aircraft with more than 100 seats) experiences fairly high price competition. This can put some pressure on manufacturers and their suppliers, but technical capabilities are often a more important factor.

11. Demand for defense contractors is not cyclical in the typical sense (i.e., tied to economic cycles), but does exhibit moderate cyclicality over fairly long periods (10 years or more from peak to trough). The main source of demand is government spending on defense, which is primarily determined by the security threats a country faces and its foreign affairs and fiscal policies. Previous declines in U.S. defense spending (by far the largest in the world) after major conflicts have been 25%-35%. Defense contractors' sales, however, declined much less, as most spending is for troop salaries and operational expenses like fuel or food. Competition is primarily based on technical capabilities, but price can be an issue for some commodity-type products or services (for example, armored vehicle maintenance).

Cyclicality

12. We assess cyclicality for the A&D industry as moderately high risk (category 4). The industry has demonstrated moderate cyclicality--relative to other industries--in both revenue and profitability, which are two key measures used

to derive an industry's cyclicality assessment (see our industry risk criteria). Based on our analysis of global Compustat data, A&D companies experienced an average peak-to-trough (PTT) decline in revenues of about 4% during recessionary periods since 1950 and only materially exceeded this level in two of the last nine recessions. The steepest decline (15% drop in revenues) occurred during the 1968-1971 downturn. Over the same period, A&D companies experienced an average PTT decline in EBITDA margin of about 13% during recessionary periods, with PTT EBITDA margin declines materially exceeding the average in only one of nine periods. The largest PTT drop in profitability totaled 26% and occurred in the 1959-1962 recession.

13. With an average drop in revenues during recessionary periods since 1950 of 4% and an average profitability decline of 13%, A&D's cyclicality assessment calibrates to moderately high risk (category 4). However, both the revenue and profitability declines are only slightly above the levels that would result in an "intermediate" (category 3) cyclicality assessment. Historically, commercial aerospace has been more cyclical than defense, but changes in the market could result in less cyclicality in the future, especially better matching of supply and demand by aircraft manufacturers and a more global customer base (and less reliance on the mature European and North American markets). We generally consider that the higher the level of profitability cyclicality in an industry, the higher the credit risk of entities operating in that industry. However, the overall effect of cyclicality on an industry's risk profile may be mitigated or exacerbated by an industry's competitive and growth environment.

Competitive risk and growth

14. We view A&D as warranting an intermediate (category 3) competitive risk and growth assessment. To assess competitive risk and growth, we evaluate four subfactors as low, medium, or high risk. These subfactors are:

- Effectiveness of industry barriers to entry;
- Level and trend of industry profit margins;
- Risk of secular change and substitution by products, services, and technologies; and
- Risk in growth trends.

Effectiveness of the A&D industry's barriers to entry--Medium Risk

15. Barriers to entry in the A&D industry are fairly high overall because of regulatory and technological requirements. Aircraft manufacturing is highly regulated by national authorities (e.g., the Federal Aviation Administration in the U.S.) to ensure safety and includes not only the finished product, but also most major components, the manufacturing process, and maintenance. Therefore, once a supplier's component is chosen for a particular aircraft ("designed-in") it is very difficult and expensive to find a new supplier, although in some cases manufacturers do source the same part from multiple suppliers. Safety requirements also require very tight tolerances and high reliability, limiting the ability of new entrants to the industry. Most aspects of aircraft manufacturing are not very capital intensive relative to other types of heavy manufacturing (such as automobiles), but developing new products is a long and expensive process. The complexity of managing different vendors in the supply-chain and long product life-cycles somewhat protects the most established players in the sector. The rate of technological change is relatively slow, with most now related to incremental changes to improve fuel economy. As jetliners can last up to 25 years or more, the need for a track record of producing quality products and providing aftermarket support (often on a global basis) also makes it difficult for new companies to enter the market. This is why there are only two global producers of jetliners, two of regional jets, and five of business jets. Companies in Russia, China, and Japan are attempting to enter the market, but it is unlikely they

will be competitive outside of their domestic markets for many years, if ever.

16. The defense sector has similar characteristics, as products must meet exacting requirements specified by the military customer and, in some cases, require that workers have security clearances. In addition, most countries' military procurement processes are very complex, making it difficult for commercial companies and smaller firms to enter the market. Significant consolidation in the defense industry in the U.S. since the mid-1990s has resulted in only a small number of firms that can produce a particular weapons systems, and in some cases only one, such as with aircraft carriers.

Level and trend of A&D industry profit margins--Medium Risk

17. Generally, there is a high revenue visibility for commercial aerospace companies, supported by order backlogs (which can equate to 6-8 years of production for popular aircraft like the Boeing 737 or Airbus A320) and the long product lifecycles. Profitability and operating margins in the industry are currently trending up, with increased production rates and reduction of research and development (R&D) expenses for new aircraft types. However, we expect relatively stable operating margins for aerospace companies unless significant and protracted economic deteriorations were to lead to a sizable cancellation of aircraft orders.

18. Currency mismatches between costs and revenues can accentuate the risk for margin volatility for non-U.S. companies or U.S. companies with foreign operations, because product pricing in the aerospace industry is predominantly in U.S. dollars. Furthermore, fluctuating input costs for components such as steel, aluminum, and energy can cause some modest margin volatility.

19. Defense margins are under some pressure because of lower defense spending in the U.S. and Europe, and changes to U.S. Department of Defense (DoD) procurement practices shifting more risk to contractors (such as the use of more fixed-price contracts). However, defense margins should remain fairly stable. Margins are generally limited by contract terms, with most contractors seeing EBITDA margins in the low-teens percentage area. Very efficient contractors with mostly fixed-price contracts may be able to exceed these levels.

Risk of secular change and substitution by products, services, and technologies--Low Risk

20. There is generally very little substitution risk for jetliners, although buses and trains do compete with aircraft on shorter routes, and high-speed trains in France and China compete with aircraft on routes of up to 300-400 miles. In addition, safety and other regulatory requirements limit the introduction of outside technologies to the industry. Technological obsolescence is a risk for particular aircraft models, but the rate of change is fairly slow. The last step-change in aircraft technology was the introduction of jet engines in the 1950s. Most technological improvements now are incremental and related to improving fuel efficiency and reducing operating costs. Aircraft construction is shifting from metal to composites to reduce weight, but this is more pronounced for long-haul, widebody aircraft because the benefits are much greater than for short-haul, narrowbody aircraft.

21. There is essentially no substitution risk for most defense contractors, as military products are highly specialized and product lifecycles are very long. Attempts to adapt commercial technologies for military use have generally been of limited success, because of the very unique requirements. The rate of technological change is generally moderate, but can accelerate during times of war.

Risk in A&D industry growth trends--Medium Risk

22. Commercial aerospace is a moderately cyclical growth industry and is currently in an upturn. Long-term demand for jetliners derives from growth in global air traffic, which has historically grown at 1.5x GDP. Differences in regional economic growth rates and in wealth formation are shifting market growth from the U.S. and Europe to Asia and the Middle East. Liberalization of air travel should also support long-term demand. Sustained high oil prices have supported recent demand by prompting airlines to replace old, fuel-thirsty aircraft with new models. Significant order backlogs and new product introductions should result in increasing production for at least the next few years.

23. Regional jet demand has been weak because of high fuel prices and is likely to remain so, especially for 50-seat regional jets. Business jet demand is also overall weak, but larger business jets have been doing better than smaller jets, as the primary customers for the latter, such as first time buyers and small to mid-size companies, were hit much harder in the recent recession.

24. Defense demand is not dependent on economic conditions, but defense spending is flat or declining in the U.S. and Europe because of fiscal constraints and the wind down of operations in Afghanistan. However, the total amount of U.S. defense spending is still massive and likely to level off after 2014.

25. Defense spending remains strong in parts of Asia and the Middle East as there are more immediate threats (e.g., North Korea and Iran) and these areas are benefiting from economic growth and high oil prices, respectively. However, it will likely not be enough to offset declines in the U.S. (by far the world's largest defense market) and Europe for most U.S. and European defense contractors.

Country risk

26. Country risk plays a critical role in determining all ratings on companies in a given country. Country-related risk factors can have a substantial effect on company creditworthiness, both directly and indirectly. In assessing country risk for an A&D company, our analysis uses the same methodology as with other corporate issuers (see global corporate criteria). Country risk is a key factor in our business risk analysis for corporate issuers, which includes the broad range of economic, institutional, financial market, and legal risks that arise from doing business in a specific country.

27. We generally determine exposure to country risk using revenues, as this information is consistently available. However, this may not capture country risks beyond those affecting demand potential. Therefore, if country exposure by EBITDA or assets is available and indicative of a materially different country exposure profile, we may use EBITDA or assets to capture weak-link risk. This could be the case, for instance, if a company's production footprint is in countries with a higher risk profile than where it derives its revenue from, and if those assets are not easily movable.

Competitive position (including profitability)

28. Under our global corporate criteria, we assess a company's competitive position as (1) excellent, (2) strong, (3) satisfactory, (4) fair, (5) weak, or (6) vulnerable. In assessing the competitive position for A&D issuers, we review an individual company's

- Competitive advantage;
- Scale, scope, and diversity;
- Operating efficiency; and

- Profitability.

29. We assess the first three components independently as either (1) strong, (2) strong/adequate, (3) adequate, (4) adequate/weak, or (5) weak. We assess profitability through the combination of its level and its volatility.

30. After evaluating competitive advantage, scale, scope, diversity, and operating efficiency, we ascribe a specific weight to each component to determine the preliminary competitive position assessment. The applicable weightings will depend on the company's Competitive Position Group Profile (CPGP). The CPGP assigned to the majority of A&D issuers that we rate is "services and product focus," whereby we weight the first three subfactors of competitive position as follows: competitive advantage (45%); scale, scope, and diversity (30%); and operating efficiency (25%). Many A&D companies manufacture products that are highly specialized and not very capital intensive, particularly defense contractors, who generally spend less than 3% of sales on capital expenditures. We may assign the "capital or asset focus" CPGP to those suppliers that provide more commoditized products or are more capital intensive, such as aerostructures, materials, forgings, or castings, where operating efficiency is a more important determinant of competitive position. The subfactor weighting for companies assigned the "capital or asset focus" CPGP is: competitive advantage (30%); scale, scope, and diversity (30%); and operating efficiency (40%).

Competitive advantage

31. In assessing the competitive advantage of an A&D company we consider its:

- Business strategy and market position;
- Product or service range;
- Technological capabilities;
- Track record of program execution; and
- Position in the supply chain.

Commercial Aerospace

32. The competitive dynamics vary for commercial aerospace companies depending on their position in the supply chain. Original equipment manufacturers (OEMs), the companies that design, assemble, and market complete aircraft, and tier 1 suppliers, those that produce large assemblies or components, generally face a limited number of competitors. For tier 2 and lower suppliers, which produce smaller assemblies or basic parts or components, there are generally many more competitors. In addition, OEMs are increasingly requiring suppliers to contribute to the design and development of new products, increasing the risk and investment required to participate.

33. In evaluating a commercial aerospace company's strategic positioning, we consider what market segments it participates in, the relative size and attractiveness of each segment, the company's market share in each segment, and if that share is growing, declining, or staying the same, as well as product development plans. Market segments include not only the major ones--jetliners, regional jets, business jets, and helicopters--but subsegments within each, such as widebody and narrowbody aircraft within jetliners and small-cabin and large-cabin business jets.

34. For suppliers it is difficult to ascertain market shares, so we consider if they have content on popular aircraft or engine programs. We also consider whether the supplier has design and engineering capabilities and is able to retain the intellectual property rights or is doing "build to print" work, where the OEM designs the part and retains the intellectual property rights and the supplier just builds it. The latter makes it easier for the OEM to switch suppliers, although the

new supplier would still have to be qualified by the OEM and, in some cases, by the national aviation authorities to be able to make the part.

35. For jetliner OEMs, we also consider whether they have competitive products in each size and range category in order to offer airlines a full family of aircraft to match their route network. This is particularly important for business jet OEMs, where customers tend to have a large degree of brand loyalty. Although a particular aircraft model can remain in production for a decade or more, it is important for an OEM to have robust new aircraft development plans in order to address any holes in the line-up or to replace existing models with new ones that incorporate the latest technology (e.g., fuel efficiency). We therefore also consider a company's track record of developing new programs on time and on budget.

36. In evaluating an OEM's technological capabilities, we consider its ability to successfully design and manufacture aircraft or engines that incorporate current-generation technologies (e.g., composite structures). Subcontractor oversight and system integration skills are also important, as is the ability to provide a global aftermarket support network. For suppliers, we consider the range of technological capabilities and any unique capabilities or highly specialized machinery or tooling the supplier may have. In assessing firms that provide services to the aviation industry, such as airframe or engine maintenance, we consider not only the firm's technical capabilities but which manufacturer and aviation authority approvals it has to work on particular aircraft or engines.

Defense

37. The defense industry has a similar structure to commercial aerospace, with a few prime contractors, companies that are usually the direct customer of the government and responsible for overseeing the design and production of a weapons system, and a much larger number of tier 1 and tier 2 suppliers. In many cases there are only a few, and, in some cases, only one (e.g., nuclear powered aircraft carriers) prime contractor that can produce a particular weapons system. Therefore, market shares for prime contractors are generally not particularly meaningful.

38. In assessing strategic positioning we consider what types of weapons systems or related services the company provides and, most importantly, if they are in areas that are a high priority to receive continued government funding. For suppliers we would consider if the programs they supply are high priority. We also consider a defense contractor's technological capabilities, especially its ability to integrate complex, highly sophisticated weapon systems and to manage subcontractors.

39. We consider a defense company's track record of successful program execution, both in regards to schedule and cost, as this is a key determinant in the government selection process.

40. An A&D company with a "strong" or "strong/adequate" competitive advantage assessment typically is characterized by a combination of:

41. For a commercial aerospace OEM:

- Leading market positions in growing market segments;
- A complete range of aircraft that addresses all or almost all customer size and range requirements; and
- Significant capabilities to design, develop, market, produce, and support aircraft or engines.

42. For a commercial aerospace supplier:

- The vast majority of revenues are related to supplying parts or services for popular, growing aircraft or engine programs, likely in a range of market segments; and
- Design capabilities for most products.
- However, it is unlikely we would assess a lower-tier supplier as "strong" unless it had very unique capabilities that could not be replicated.

43. For defense contractors:

- A majority of programs that are high priority for government spending; and
- A broad range of technological and system integration capabilities.

44. For all of the above:

- Position as a commercial aerospace OEM, a prime defense contractor, or Tier 1 supplier;
- A solid track record of successful program execution and new product development.

45. An A&D company with a "weak" or "adequate/weak" assessment of its competitive advantage typically is characterized by a combination of:

46. For a commercial aerospace OEM:

- Small market share or participates in markets with poor growth prospects (e.g., 50 seat regional jets);
- A limited product line or one with large gaps; and
- Limited capabilities in one or more areas of design, development, marketing, production, or aftersales support.

47. For a commercial aerospace supplier:

- Most revenues are from supplying parts or services to aircraft/engine programs with weak demand or nearing end of production;
- Revenues focused on market segments with unfavorable medium/long-term growth prospects;
- Largely build-to-print work, with limited or no design capabilities; and
- Produces parts that are commodity-like or have limited technological sophistication.

48. For a defense contractor:

- Majority of revenues are from programs that are likely to see funding cuts; and
- Very narrow range products or ones that have limited technological sophistication.

49. For all of the above:

- A lack of track record, or a subpar track record on program development and execution; and
- Position as a tier 2 or tier 3 supplier.

Scale, scope, and diversity

50. In assessing the scale, scope, and diversity of an A&D company, we consider:

- Breadth of product offering;
- Program concentration;

- The degree of diversity of its end-markets;
- The geographic balance of its sales; and
- Its degree of customer concentration.

51. Many A&D companies participate in both the commercial aerospace and defense markets, as well as in some related industrial markets, which we generally view as favorable due to the different cycles and characteristics of the various markets.

Commercial Aerospace OEMs

52. In assessing the breadth of a commercial aerospace OEM's product line, we consider if the company offers a comprehensive selection of aircraft with different seat capacities and range. This is particularly important for business jet OEMs, whose customers often prefer for manufacturers to offer a range of aircraft at different sizes and price points so they can move up to larger aircraft from the same manufacturer as their needs change.

53. In assessing customer diversity, we consider not only the number of customers and their proportion of sales, but also the type of customer (e.g., legacy airline or low-cost carrier). Although commercial aerospace is a global business, different regions have different growth prospects and cycles, so geographic diversity is also important.

Commercial Aerospace Suppliers

54. The relatively small number of OEMs means customer concentration is often very high for commercial aerospace suppliers. Therefore, we consider for which individual aircraft programs the company provides parts or systems and the relative attractiveness of each program. We also consider if the company supplies different commercial market subsegments (i.e., jetliners, regional jets, business jets, and helicopters), as well as defense or related industrial markets.

55. For the same reason, the geographic diversity of customers is also usually very limited. When assessing geographic diversity, we consider the geographic diversity of the end customers for the aircraft or engine for which the supplier is building parts.

56. In assessing the breadth of a commercial aerospace supplier's product offering, we consider the range of capabilities a supplier offers, and whether it only offers components or can provide larger assemblies or systems. We also consider the proportion of the company's products that are used to build new aircraft against those sold as replacements in the aftermarket, as the two markets have different dynamics, and the latter is often much more profitable. For companies that provide aviation services, such as airframe or engine maintenance, we consider what aircraft or engines the company has manufacturer or regulatory authorization to work on.

Defense Contractors

57. In assessing the program diversity of a defense contractor, we consider the proportion of sales for each program and its funding priority. In most countries, defense spending is allocated to four main uses--personnel, procurement, R&D, and operations and maintenance (O&M)--and the spending priorities can change over time with political or security developments. The primary sources funding most defense contractors are procurement and R&D and, to a lesser extent, O&M for services such as training and maintenance. Therefore, when considering program diversity we also consider the funding sources, especially the balance between development programs (usually funded out of R&D) and production programs (usually funded out of procurement). Development programs are often lower margin, but should

eventually become higher margin production programs because, in most cases, the contractor who develops a weapons system also is selected to produce it.

58. We also consider the contract type (fixed price or cost-plus) when assessing program diversity. Under cost-plus contracts, firms are reimbursed for their costs incurred plus a fee, so any cost overruns are borne by the customer, but margins are generally low to reflect the lower risk. Fixed price contracts, on the other hand, shift all of the risk of cost overruns to the contractor and generally can be much higher margin, if the company can control costs. There are also numerous other contract types that mix the characteristics of cost-plus and fixed price contracts. Development programs are usually cost-plus, because of the uncertainty and risk of a new weapons system, especially those that use cutting edge technology (e.g., stealth fighter aircraft).

59. Defense contractors often only have one ultimate customer, their domestic government. However, the budget prospects often vary, not only between the military and civilian government agencies, but also among the various military services (i.e., Army, Navy, Air Force, Marines). Therefore, when assessing customer diversity for defense contractors we look at the proportion of sales to each military service, intelligence agencies (which can be military or civilian), civilian government agencies, foreign governments, and, in some cases, commercial customers. For subcontractors, we generally consider the ultimate end user of the product or service as the customer, not the prime contractor, as that is the source of demand.

60. In assessing product breadth, we consider the range of weapons systems, subsystems, components, and related services the firm offers.

61. An A&D company that warrants a "strong" or "strong/adequate" assessment of scale, scope, and diversity typically is characterized by a combination of:

62. For commercial aerospace OEMs:

- Offers a full family of aircraft or engines to meet a range of customer needs;
- Customers are well diversified by type (e.g., low-cost versus legacy airlines) and geography; and
- Limited individual customer concentration.

63. For commercial aerospace suppliers:

- Participation in a range of popular programs, often with exposure to various commercial aerospace market segments (i.e., jetliners, regional jets, business jets, helicopters), as well as defense and industrial markets;
- Broad range of products/capabilities, and ability to offer components and higher-level assemblies or systems; and
- Good balance of sales for new aircraft/engines and for the aftermarket.

64. For defense contractors:

- Limited program concentration;
- Limited customer concentration;
- Good mix of domestic funding sources (i.e., procurement, R&D, O&M), including foreign sales;
- Balance of development and production programs and cost-plus and fixed price contracts; and
- Broad product/service offering.

65. An A&D company warranting a "weak" or "adequate/weak" assessment of scale, scope, and diversity typically is characterized by a combination of:

66. For commercial aerospace OEMs:

- Sales derived mostly from a few products or those in markets with poor growth prospects;
- Significant individual customer concentration; and
- Limited geographic diversity of customers.

67. For commercial aerospace suppliers:

- Significant proportion of sales derived from a small number of aircraft programs or those that have less favorable growth prospects;
- Limited sales to the higher margin aftermarket;
- Limited product offerings or lack of ability to produce higher level assemblies or systems; and
- Participation in only a few commercial aerospace markets subsegments, or limited sales to defense and industrial markets.

68. For defense contractors

- Majority of sales related to one or a few weapons programs, especially those likely to see declining funding;
- Few development programs that could turn into higher margin production programs;
- High proportion of fixed price development contracts;
- High concentration of sales from one military service or civilian government agency;
- Limited funding diversity, or no or little foreign or commercial sales; and
- Limited product/service offering.

Operating efficiency

69. In assessing operating efficiency for an A&D company, we consider its relative cost position versus industry peers, its ability to control costs and improve efficiency, the flexibility to manage capacity and workforce to match demand, and the ability successfully integrate acquisitions. To the extent an A&D company has a high degree of operating efficiency, it should be able to generate better profit margins than peers that compete in the same markets, whatever the nature of the prevailing market conditions.

70. In reviewing the relative cost position of an A&D company compared with those of its peers, we primarily consider its EBITDA margin; its ratio of sales, general, and administrative spending (SG&A) to sales; and its capex-to-sales ratio. Both the overall cost and margin profile of an A&D company and those of its various reporting segments are important in our analysis.

71. In reviewing cost structure flexibility, we consider an A&D company's ability to limit margin deterioration in a downcycle through cost reduction, especially labor, as well as its ability to match capacity with demand. Indicators of cost flexibility may include degree of operating leverage, degree of vertical integration and outsourcing, labor cost characteristics (including unionized/non-unionized workforce profile), and pension cost considerations,

72. We consider a company's cost management by reviewing its record of cost reduction during good and bad times, the effectiveness of its restructuring programs and lean manufacturing programs where applicable, and its track record at

successfully integrating acquisitions.

73. In addition, for commercial aerospace OEMs, we consider whether it is able to develop new products on time and on budget, and how quickly it can come down the learning curve and reduce per-unit costs. For defense contractors, we also evaluate the ability to keep programs on cost and on schedule, and to properly bid and structure contracts so that the contractor is appropriately compensated for the risk being taken.

74. An A&D company with a "strong" or "strong/adequate" operating efficiency assessment typically is characterized by a combination of:

- Profitability, as measured primarily by EBITDA margins, that is consistently higher than peers' (after taking into account differences in sales mix that also affect profit margins);
- A relatively flexible cost structure, often evidenced by lower operating leverage compared to peers', good ability to adjust labor costs and capacity in a downcycle, or to limit labor cost inflation;
- A track record of ongoing cost structure improvements, such as structural labor cost reductions, low cost sourcing, and footprint reduction, achieved during bad and good times;
- Although new commercial aircraft programs are often delayed or cost more than expected because of their technological complexity, a commercial aerospace company with "strong" or "strong/adequate" operating efficiency would be expected to have a good track record of introducing new products with minimal delays or costs overruns, and have demonstrated an ability to reduce per-unit costs quickly as production increases; and
- For a defense contractor, few programs that are materially above cost targets or behind schedule.

75. An A&D company with a "weak" or "adequate/weak" assessment of its operating efficiency typically is characterized by a combination of:

- Profitability, as measured primarily by EBITDA margins, that is below its peer group's (after taking into account differences in sales mix that also affect profit margins);
- Less-flexible-than-average cost structure (for instance, because of high fixed or semi-fixed cost structure, labor inflexibilities, outdated asset base or production technologies versus peers', or an inefficient degree of vertical integration) or high profit and margin sensitivity to raw material cost fluctuations;
- A history of restructuring actions without tangible saving benefits, or of operational missteps;
- For a commercial aerospace company, a history of significant delays or cost overruns on new products or difficulty increasing production and improving profitability; and
- For a defense contractor, programs are frequently above cost or behind schedule; a history of underestimating cost or complexity of programs, or of agreeing to unfavorable contract terms to win business.

Profitability

76. The profitability assessment can confirm or modify the preliminary competitive position assessment. The profitability assessment consists of the level and volatility of profitability. The two components are combined into the final profitability assessment using a matrix (see our global corporate criteria).

Level of profitability

77. The level of profitability is measured on a three point scale: "above average," "average," and "below average."

78. We use EBITDA margin as the primary indicator of an A&D company's level of profitability, based on thresholds identified in table 1 below. In accordance with the global corporate criteria, for this assessment we typically calculate

the five-year average EBITDA margin using the last two years of historical data, and our forecasts for the current year and for the following two years. We may put more emphasis on forecast years if historical data is not deemed representative or to take into account deteriorating or improving profiles where prospective ratios meaningfully differ from average ratios.

Table 1

EBITDA Margin Thresholds	
Below average	< 10%
Average	10%-18%
Above average	> 18%

Volatility of profitability

79. The volatility of profitability is determined on a six point scale, from (1) least volatile to (6) most volatile.

80. In accordance with our global corporate criteria, we generally calculate the volatility of profitability using the standard error of regression (SER), subject to having at least seven years of historical annual data. We generally use nominal EBITDA as the metric to calculate the SER for A&D companies, although we may also use EBITDA margin or return on capital. In accordance with the global corporate criteria, we may--subject to certain conditions being met--adjust the SER assessment by up to two categories better (less volatile) or worse (more volatile). If we do not have sufficient historical information to calculate the SER, we follow the global corporate criteria guidelines to determine the volatility of profitability.

Part II--Financial Risk Analysis

Accounting and analytical adjustments

81. In assessing the accounting characteristics of A&D companies, we use the same methodology as with other corporate issuers. Our analysis of a company's financial statements begins with a review of the accounting to determine whether the statements accurately measure a company's performance and position relative to its peers and the larger universe of corporate entities. To allow for globally consistent and comparable financial analyses, our rating analysis may include quantitative adjustments to a company's reported results. These adjustments also enable better alignment of a company's reported figures with our view of underlying economic conditions. Moreover, they allow a more accurate portrayal of a company's ongoing business. Adjustments that pertain broadly to all corporate sectors, including this sector, are discussed in "Corporate Methodology: Ratios And Adjustments."

82. The one significant industry-specific adjustment is related to the ability of U.S. defense contractors to recover most postretirement costs over time through pricing in their government contracts.

Postretirement benefits (PRBs) and workers compensation cost recovery under government contracts

83. Costs for PRBs (both pensions and other postretirement benefits, such as health insurance) and deferred workers compensation claims are allowable costs under U.S. government contracts (including the U.S. Foreign Military Sales program). Therefore, defense contractors, as well as their subcontractors (including firms based outside the U.S.), are generally able to recover these costs through pricing in their U.S government contracts, with some limitations and calculation/timing differences. The ability to recover these costs reduces the impact of PRB/workers compensation

liabilities on credit quality, so we adjust our ratios to account for this. We may also apply this adjustment to government contracts in other countries where a similar mechanism exists, although we believe this is rare outside of the U.S.

84. Defense contracts come in two general types: fixed price, where the contractor provides a product or service for an agreed price and is responsible for any cost overruns; and cost-plus, where the contractor is reimbursed for all of its allowable costs (sometimes with a limit) plus a fee. Although there is a range of contract types that have characteristics of both fixed price and cost-plus, companies usually do not report this level of detail.

85. We believe defense contractors should be able to recover all of their PRB/workers compensation costs under cost-plus contracts over time. However, we estimate that under fixed price contracts the contractor would only be able to recover increased costs when a new contract is awarded. Competitive pressures may make it difficult for the contractor to add the full costs to the new contract. Therefore, we estimate only 50% of these costs can be recovered under fixed price contracts over time.

86. The data needed to make the adjustment are:

- Percentage of revenues derived from U.S. government contracts (A)
- Percentage of contracts that are fixed price (B) and cost plus (C)

87. We reduce our standard adjustments to debt for PRBs and workers compensation by the following percentage:

- A x [(B x 50%) + (C)]

Cash flow/leverage analysis

88. In assessing the cash flow adequacy of an A&D issuer, our analysis uses the same methodology as with other corporate issuers (see the global corporate criteria). Cash flow/leverage is assessed on a six point scale--ranging from (1) minimal to (6) highly leveraged--by aggregating the assessments of a range of credit ratios, predominantly cash flow-based, which complement each other by focusing attention on the different levels of a company's cash flow waterfall in relation to its obligations.

Core ratios

89. For each company, in accordance with our ratios and adjustment criteria, we calculate two core debt payback ratios: funds from operations (FFO) to debt and debt to EBITDA.

Supplemental ratios

90. In addition to our analysis of a company's core ratios, we consider supplemental ratios in order to develop a fuller understanding of a company's credit risk profile and refine our cash flow analysis in accordance with the global corporate criteria. For A&D companies, we generally use:

- Free operating cash flow to (FOCF) to debt as the default supplemental ratio. Although generally not working capital or capex-intensive, A&D companies do often have to invest in both when developing new products.
- We may alternatively use debt service coverage ratios ([FFO + interest]/cash interest, or EBITDA to interest), when the preliminary cash flow and leverage assessment indicated by the core ratios is "significant" or weaker;
- For companies that return a significant portion of their FOCF to shareholders through dividends, we may consider discretionary cash flow to debt as the most relevant supplemental ratio.

Part III--Rating Modifiers

Diversification/portfolio effect

91. In assessing the diversification/portfolio effect on an A&D company, our analysis uses the same methodology as with other corporate issuers (see our global corporate criteria).

Capital structure

92. In assessing an A&D company's capital structure, our analysis uses the same general methodology as with other corporate issuers (see our global corporate criteria).

Liquidity

93. In assessing the liquidity of an A&D company, our analysis uses the same general methodology as with other corporate issuers (see our global corporate criteria).

Financial policy

94. In assessing financial policy on an A&D company, our analysis uses the same methodology as with other corporate issuers (see our global corporate criteria).

Management and governance

95. In assessing management and governance on an A&D company, our analysis uses the same methodology as with other corporate issuers (see our global corporate criteria).

Comparative ratings analysis

96. In assessing the comparative ratings analysis on an A&D company, our analysis uses the same methodology as with other corporate issuers (see our global corporate criteria).

RELATED CRITERIA AND RESEARCH

- Methodology And Assumptions: Liquidity Descriptors For Global Corporate Issuers, Jan. 2, 2014
- Corporate Methodology, Nov. 19, 2013
- Methodology: Industry Risk, Nov. 19, 2013
- Corporate Methodology: Ratios And Adjustments, Nov. 19, 2013
- Country Risk Assessment Methodology And Assumptions, Nov. 19, 2013
- Methodology: Management And Governance Credit Factors For Corporate Entities And Insurers, Nov. 13, 2012
- Principles Of Credit Ratings, Feb. 16, 2011

These criteria represent the specific application of fundamental principles that define credit risk and ratings opinions. Their use is determined by issuer- or issue-specific attributes as well as Standard & Poor's Ratings Services' assessment of the credit and, if applicable, structural risks for a given issuer or issue rating. Methodology and assumptions may change from time to time as a result of market and economic conditions, issuer- or issue-specific factors, or new empirical evidence that would affect our credit judgment.