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The next era of aerospace and defense:

How to outperform in an environment of innovative disruption

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Executive summary

A significant portion of the aerospace and defense (A&D) industry is underperforming its potential.

- Over the past 25 years, anywhere from 25 percent to more than 50 percent of A&D companies have stuck to strategies and business models that more or less "stayed the course" despite significant changes in the industry environment, structure, and market needs.
- These companies exhibited poorer performance than those that adapted their strategies and business models to better align with changing environments and market needs.
- The companies that adapted outperformed those that didn't by up to seven times.[1]

Today, much of the A&D industry is at risk from disruption.

- The democratization of technology, digitalization, globalization, the atomization of security threats, and other factors are disrupting many A&D markets in ways not seen for years. These forces are opening the door for more nimble competitors and new entrants able to compete in different ways.
- Approximately 60 percent of the revenue for the largest A&D companies is associated with business units whose business models are no longer well aligned to market needs.[2] This revenue is at particular risk of disruption.

Making incremental choices to run faster just to keep up will become increasingly insufficient. To outperform the industry, companies will need to:

1. Choose a strategy that actively creates value, rather than simply stays the course, and has shown the potential to demonstrably outperform other strategies.
2. Deploy a business model that reflects the true needs of chosen markets today and is nimble enough to proactively adapt for evolving needs.
3. Stop the death spiral of running faster just to keep up. Innovate new business and operating models that break the traditional constraints of the past and radically improve affordability for markets facing increasing competition and commoditization.

If history is any judge, the current concept of A&D industry structure and financial performance will not remain viable over the next decade. Now is the time to develop a thoughtful, systematic, yet innovative approach to outperform the industry. Choosing the right strategy and business model(s) has the potential to improve company financial performance. Rethinking the constraints that form the basis for strategy and business model decisions today will be the hallmark of those companies that are truly poised to outperform the A&D industry over the next decade.

How did we get here?

Eras of aerospace and defense

The aerospace and defense (A&D) market is one of the largest in the world. With 2015 revenues of $674B for the largest 100 companies and $1.69T spent on defense by the 50 highest-spending countries, the A&D industry employs over 4.1 million people in the United States alone.[3]

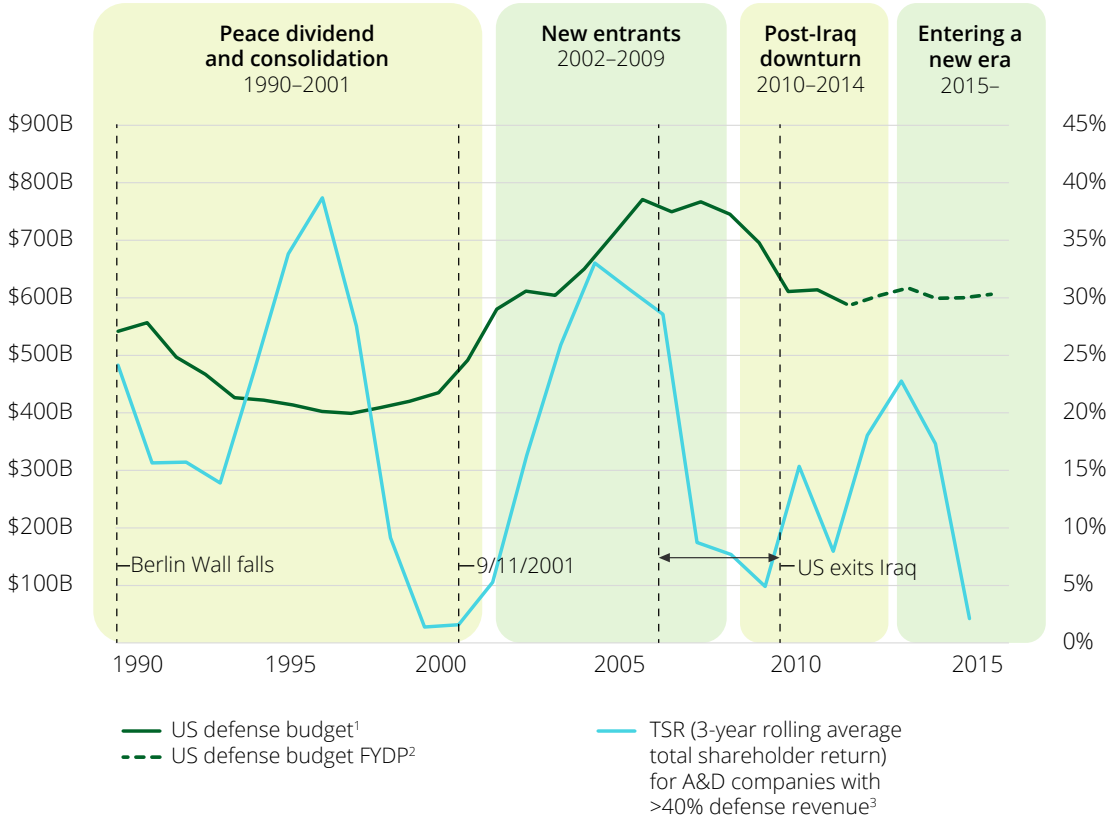
But the defense industry today looks much different than it did 20–30 years ago. Between World War II and the late 1980s, the defense portion of the aerospace and defense industry was characterized by small business units within large industrial conglomerates. As of 1990, roughly 50 percent of the revenue from the largest 20 companies in the defense industry was associated with conglomerates.

As a result of the peace dividend of the late 1980s and early 1990s, many conglomerates exited the defense market. Consolidation among the remaining defense players removed large amounts of overcapacity.[4] The result was the birth of the defense specialist: companies that exist solely to serve the defense needs of their home countries. By 2000, only 10 percent of the revenue of the largest 20 companies in the industry was associated with conglomerates.[5]

In the 2000s, the urgency created by new asymmetric threats enabled a different breed of company to enter, or re-enter, the defense market. These companies disrupted the industry by providing "good enough," often commercially derived solutions, to meet urgent defense needs.

The aerospace and defense market is one of the largest in the world, but the industry today looks much different than it did 20–30 years ago.

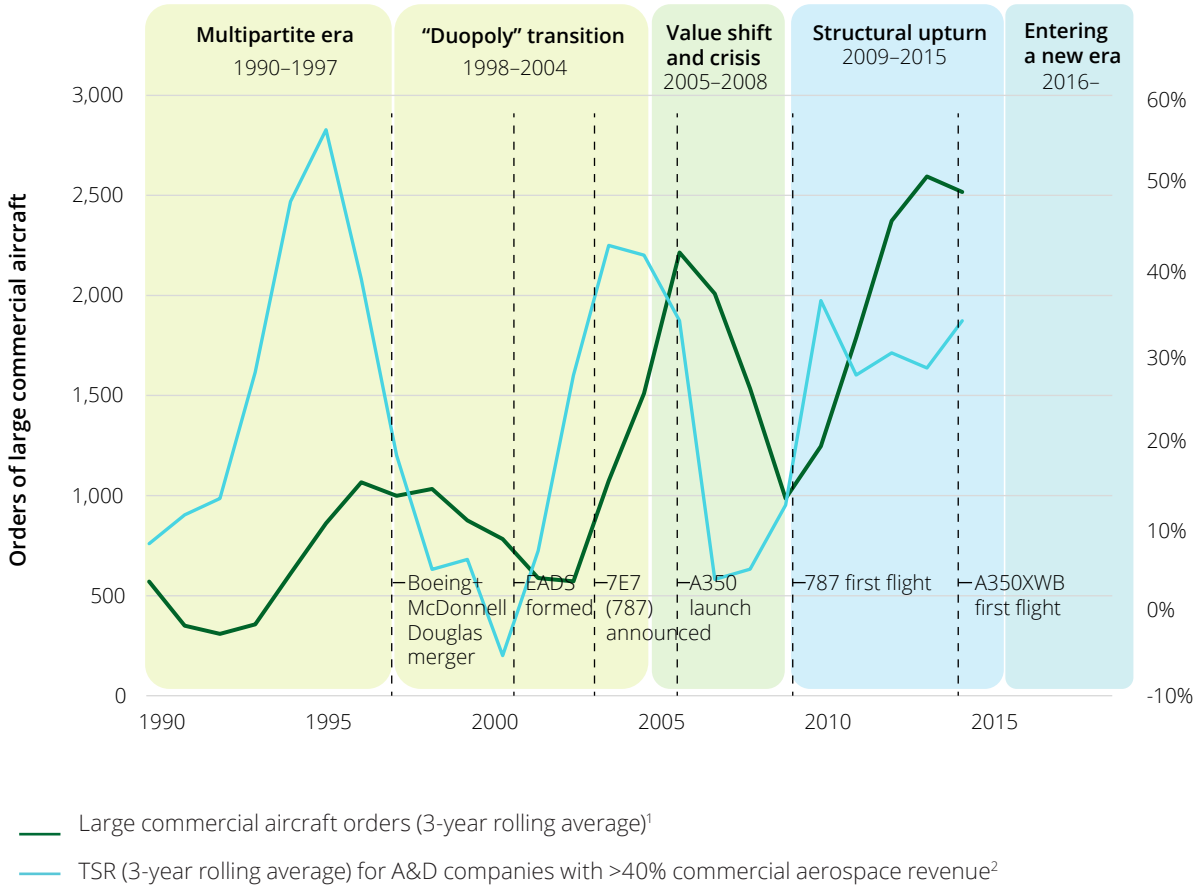
Figure 1. Defense cycles 1990 to present



[1] US DoD Green Book; usgovernmentspending.com; [2] projections represent Future Years Defense Program (FYDP) FY17; [3] Deloitte analysis of S&P Capital IQ data; unweighted three-year rolling average of TSR of the 100 largest A&D companies whose A&D revenue comprised at least half of total company revenue and whose defense revenue comprised at least 40% of total company revenue.

The commercial aerospace portion of the industry also looks substantially different than it did 20–30 years ago. The airframer consolidation up to and through the 1990s, coupled with the rise of what is now Airbus, shifted a multipartite and vertically integrated industry to a virtual duopoly with a highly distributed global supply chain. This changed the pricing dynamics and improved the relative stability of production rates. But the current environment has also brought challenges, including the erosion of the duopoly at the smaller end of the traditional large commercial transport market, value shifting to lower supply tiers, IP control issues, and program risk.

Figure 2. Commercial aerospace cycles 1990 to present



[1] Deloitte analysis of the following data: The Boeing Company, "Order and deliveries," accessed in November 2015, active.boeing.com/commercial/orders/index.cfm; Airbus Group, "Orders and deliveries," accessed in November 2015, www.airbus.com/company/market/orders-deliveries/; [2] Deloitte analysis of S&P Capital IQ data; unweighted three-year rolling average of TSR of top 100 majority-A&D companies of whose A&D revenue, commercial aerospace comprised at least 40%.

In large part, shifts in demand—which affect industry performance and structure—trigger new eras. **So, will our current concept of industry structure and financial performance remain viable over the next 10 years?** The answer is probably no. Defense budgets are beginning to grow once again, unleashing a renewed confidence in defense assets. But concerns linger about structural overhead and inefficiencies (in both contractor and customer).

On the commercial side, demand continues to make the sector reasonably attractive, at least for the moment in certain areas, but its structure isn't likely to be stable. Value is unevenly distributed across supply tiers. Competition is increasing in portions of the airframer market. And market power is shifting toward MRO, aftermarket, and providers that face the end customer, such as interiors suppliers.

But more fundamentally, knowingly or unknowingly, the status quo of the A&D industry has been—and is being increasingly—challenged by a set of fundamental shifts in both market need and business environment. The industry's frequent response of running faster to keep up isn't likely to be sufficient. We've finally reached a point where today's disruptive factors require A&D leaders to rethink both their strategies and business models to succeed in the longer term.

Strategy matters

A historical look

A&D companies whose strategies helped shape the shifting industry environment—or took advantage of it—have historically outperformed their peers. This seems fairly obvious. But many companies chose passive or incremental strategies instead, either because they did not recognize how the environment was shifting or their leadership teams lacked the conviction or investor permission to make adjustments. These companies did not fare as well.

Systematic strategy choices

It has been our observation that some A&D companies struggle with making informed choices regarding *how to create value* beyond organic business development because they lack a systematic set of defined alternatives. While there are many ways to define strategy alternatives, we've outlined a simplified set of alternatives ranging from the most passive (e.g., stay the course) to the more active (e.g., restructure portfolio). Deloitte's analysis of the strategies of the largest A&D companies dating back to the early 1990s is based on our own experience and observations and our analysis of public documents and company statements. While this analysis is somewhat subjective, and the number of companies included in this analysis is limited by the market itself, it provides a reasonable basis for making valuable observations.

We outline seven simplified value-creation strategies:

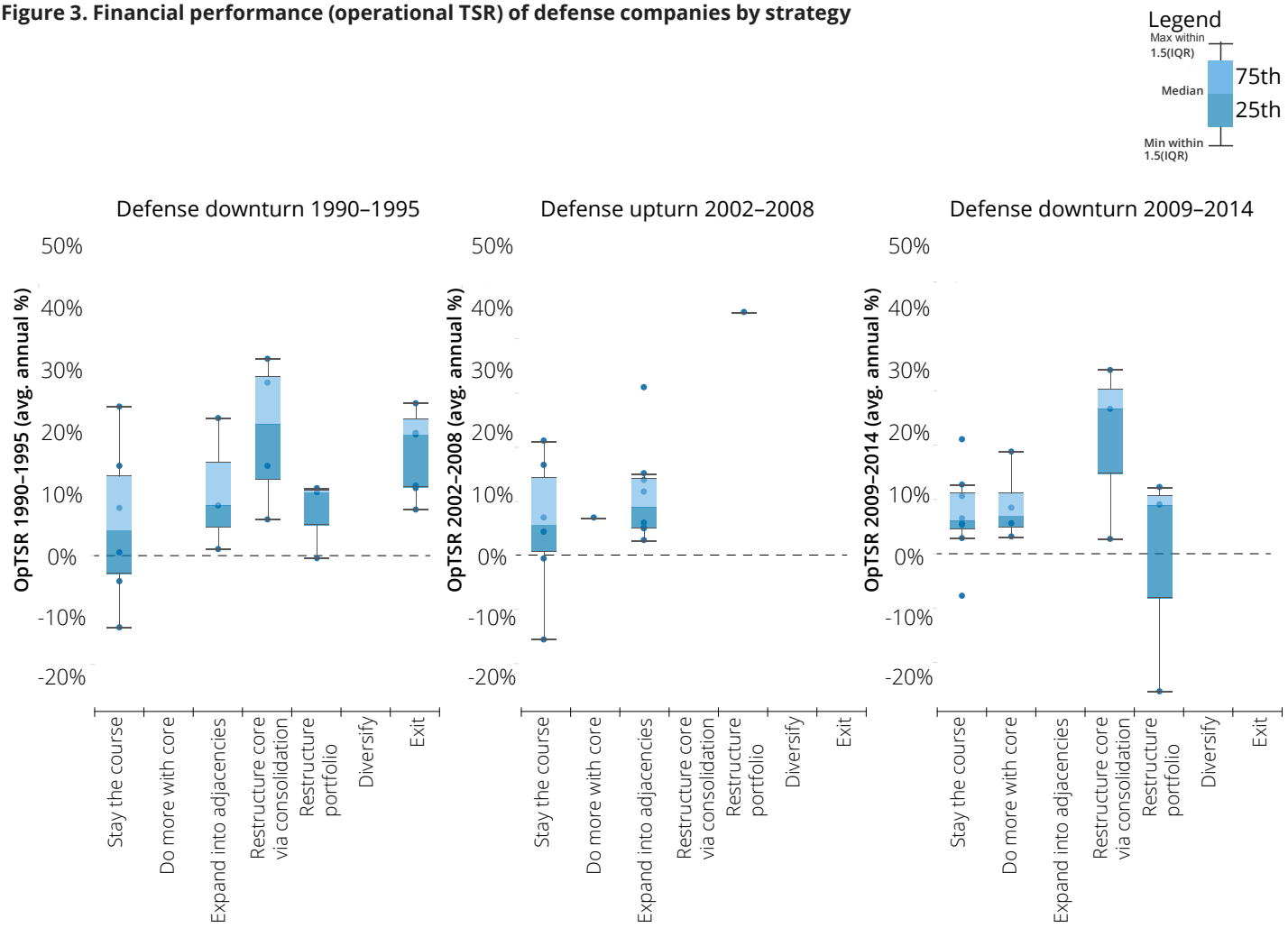
1. **Stay the course:** Characterized by lack of significant moves, focuses on keeping the current business running in largely the same way it has been.
2. **Do more with core:** Largely focuses on the current core business but shows some emphasis on exploiting its core business in a proactive way. For example, the company might pursue a strategy to innovate its core offering, disrupt others who serve the same markets, or improve core business performance through a significant transformation program.
3. **Expand core into adjacencies:** Makes significant investments—both organic and inorganic—to expand the addressable market of its core business, for example through geographic, adjacent capability, or customer need expansion.
4. **Restructure core via consolidation:** Removes excess capacity from the industry via significant inorganic consolidation.
5. **Restructure portfolio:** Focuses on buying and selling major portions of its portfolio.
6. **Diversify:** Builds capabilities outside its current core; for example, a defense business acquiring a company largely serving a commercial market. This strategy has not been used often given the poor results of diversification prior to the 1990s.
7. **Exit:** Completely exits the A&D market.

Defense

During both of the last two defense budget downturns, companies that adopted consolidation strategies tended to fare the best, as measured by total shareholder return (TSR). Companies that repositioned their portfolios to more attractive market segments also fared well, but they had much higher low-side risk. Companies that exited defense positions did well if they timed the cycle right. But those that "hunkered down" and waited for the downturn to blow over fared among the worst (see figure 3).[6] During defense upturns, the question of which strategies fare best is a bit more nuanced, as a rising tide tends to help many—particularly as long as one holds solid market franchise positions.

One of the most surprising findings in our research is the number of companies that deployed stay-the-course strategies or strategies that were more incremental in nature despite 1) the dramatic changes in the business environment and 2) the fact that these strategies have been associated with the lowest relative TSR performance.

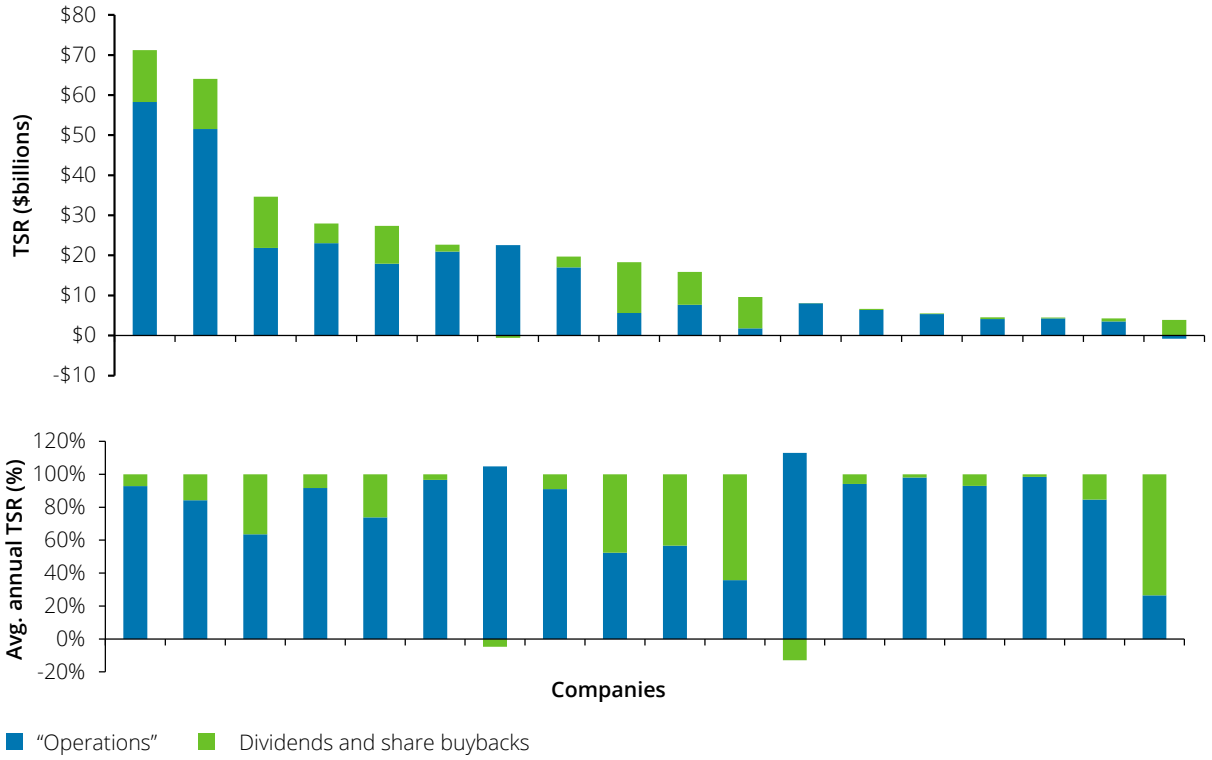
Figure 3. Financial performance (operational TSR) of defense companies by strategy



Source: Deloitte analysis of S&P Capital IQ, Compustat, DACIS, various sources including annual reports and public statements.

Also of note is the fact that many companies used financial techniques during the last downturn to maintain TSR. Increasing dividends and share buybacks helped to boost TSR despite softness in the underlying operational performance. Across the largest 20 defense companies (for which A&D revenue constitutes more than 50 percent of total revenue) roughly 25 percent of total TSR during the 2009–2014 period (approximately $93B of $366B) can be attributed to financial techniques as opposed to returns generated by underlying operational performance, or OpTSR (see figure 4 on the next page).[7] OpTSR is an approximation of the amount of shareholder return derived from operations as opposed to financial techniques such as dividends and share buybacks. It's calculated by deducting the components of dividends and changes in outstanding shares.[8]

Figure 4. Estimated contribution of financial strategies to TSR of the largest 20 A&D companies during the last defense downturn (2009–2014)



Source: Deloitte analysis of S&P Capital IQ data of largest 20 A&D companies whose A&D revenue was over half total company revenue.
Note: Some data are for 2012-2014 given public reporting limitations.

These financial techniques were concentrated mostly in the largest defense companies (table 1). It's also worth noting that the median OpTSR of the largest companies was lower than that of the smaller defense companies. This underlines the fact that some of the lower tiers are relatively insulated from the immediate effects of downturns. Interestingly, we didn't find these financial techniques used to the same degree by commercial aerospace companies during downturns.

Table 1. Distribution of financial technique usage by defense company size

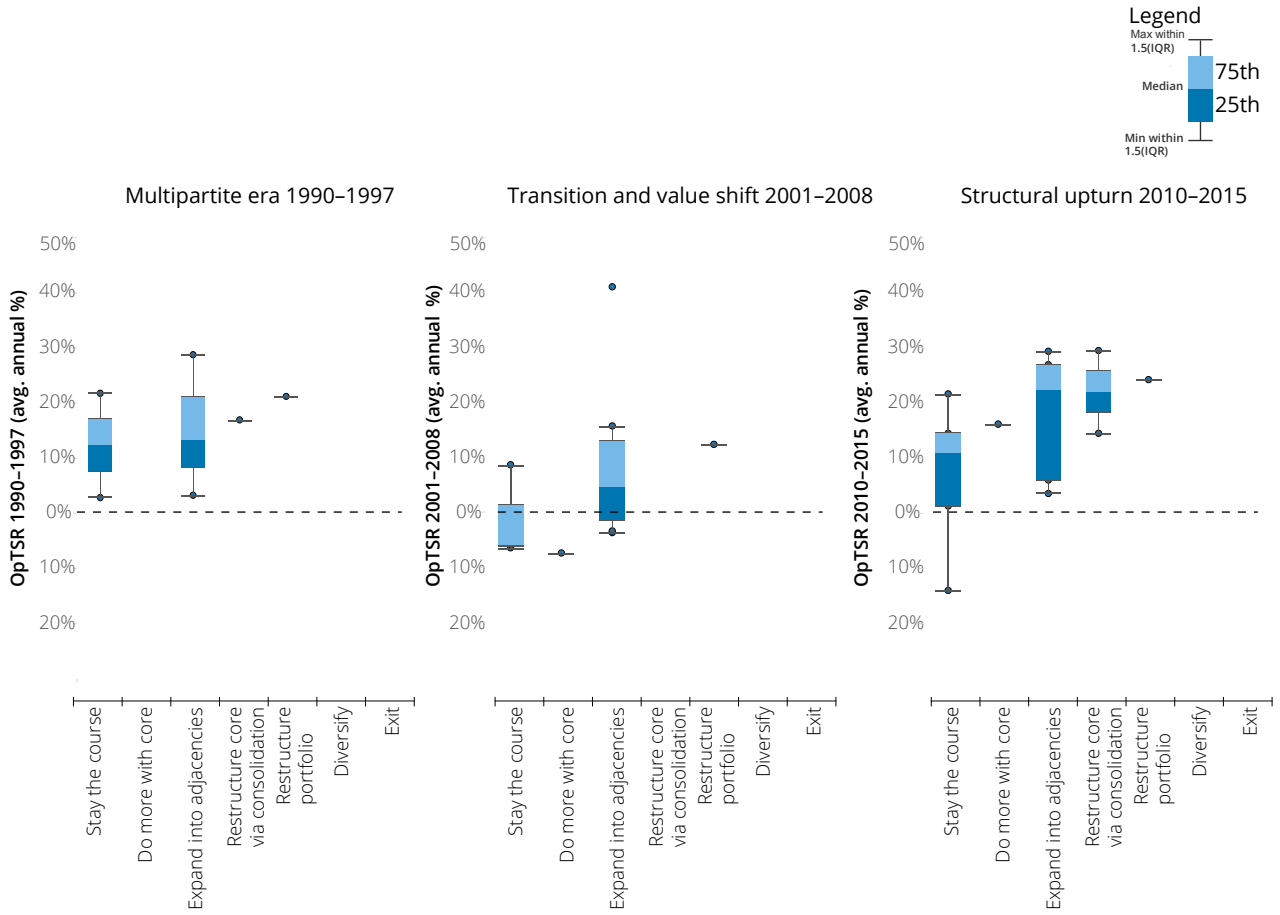
Size of company (by revenue)	Median average annual TSR (2009–2014)	Median average annual OpTSR (2009–2014)	Percent contribution to TSR of dividends and share buybacks (median, 2009–2014)
Top quartile	17%	12%	15%
Second quartile	16%	16%	5%
Third quartile	15%	19%	7%
Bottom quartile	16%	17%	3%

Source: Deloitte analysis of S&P Capital IQ data for all the largest 100 A&D companies for which A&D is the majority of total company revenue; some companies excluded given incomplete data.

Commercial

Our research shows that the same tenet holds for commercial aerospace as for the defense market—more passive strategies fare the poorest. Expansion into adjacent markets has often been associated with relatively high TSR compared to peers but, as was also the case for defense companies, those movements carry a high beta. As in the defense sector, consolidation appeared to be a favorable strategy although the small number of outright consolidation moves makes this harder to assess (figure 5).

Figure 5. Financial performance (operational total shareholder return) of commercial aerospace companies by strategy



Source: Deloitte analysis of S&P Capital IQ, Compustat, DACIS, various sources including annual reports and public statements.

The bottom line

The bottom line is that strategy does matter. Passive strategies tend to be associated with the lowest median OpTSR performance, particularly in downturns. Of the more active strategies, there is one strategy for each of the defense and commercial aerospace portions of the industry that clearly outperformed others over the last cycles. For defense, removing excess capacity via consolidation—an often overlooked strategy to create value—has historically been a good way to generate returns. Expanding or repositioning into adjacent market segments can potentially drive significant returns but at a higher beta (i.e., much greater low-side risk if a wrong move is made). For commercial aerospace, expanding into adjacencies outperformed other strategies, although again with a high beta. Consolidation is also likely a positive performer, although there are few recent notable examples.

Business models make a difference

Execute the chosen strategy well

Without good execution, even the most brilliant strategy will fail. One of the primary drivers of good strategy execution is business model coherence: the deployment of a business model (cost structure, financial risk model, etc.) that enables the strategy and is consistent with market demands.

Higher business model coherence is associated with better financial performance (figure 6). But despite this fact and significant changes in competition, substitutes, and market needs, many companies continue to deploy the same business and operating models they have for years. This tends to lead to suboptimal financial performance and increases exposure to disruption.

To illustrate the concept of business model coherence, compare the market for nuclear aircraft carriers to the market for military transport aircraft. The former market is largely insulated from competition but demands absolute focus on what is effectively a single customer. It also requires cutting-edge technological superiority and a platform that will have to remain superior for decades. A model that enables bespoke development with heavy expense on technology development and integration, plus sufficient overhead to address significant compliance requirements, is important for this market.

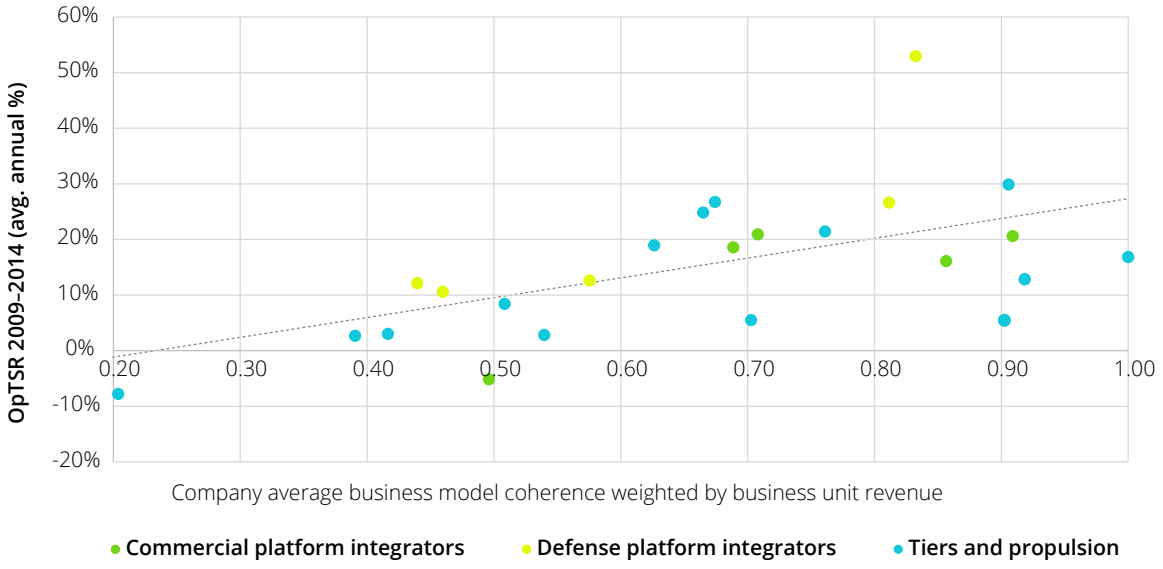
On the other hand, the market for military transport aircraft requires the ability to compete in an increasingly contentious globalizing market with products that may include commercially derived platforms. A product line-centric model with a trim cost structure and the ability to invest ahead of demand is important in this case.

If a company deploys a business model that addresses the requirements of the market served, the company has high business model coherence. If a company deploys a business model that doesn't fit well with what the market requires—for example, applying a model for nuclear aircraft carriers to the military transport aircraft market—the company has low business model coherence.

Companies with higher business model coherence outperform those with lower business model coherence (see figure 6). Our analysis of companies where more than 75 percent of revenue from major business lines fits what their markets require (within one business model) shows that they outperform companies whose business models do not by more than four times the OpTSR.[9]

If a company deploys a business model that does not fit well with what the market requires, the company has low business model coherence.

Figure 6. Correlation between business model coherence and financial performance



Source: For OpTSR, Deloitte analysis of S&P Capital IQ data; for business model coherence, Deloitte analysis of current business model practices of the major business units of the largest A&D companies based on company public documents, public statements, and other industry analysis.

Note: Correlation coefficients overall = 0.59; Commercial platform integrators = 0.77, Defense platform integrators = 0.85, Tiers and propulsion = 0.62.

Why is business model coherence important?

While the correlation between business model coherence and TSR might seem obvious, achieving business model coherence isn't always straightforward. Our research found that business units representing approximately 60 percent of the revenue of the largest A&D companies deploy business models that are not truly aligned with market needs. Roughly 14 percent of revenue ($70B) is more than one business model away from what the market requires, e.g., bespoke development for a market requiring at-rate product line. Another roughly 44% of revenue ($220B) is one business model away, e.g., bespoke development for a market requiring highly tailored product lines.[10]

Why is there a mismatch between models deployed and models required? The gap is largely due to the fact that over the past years some markets have moved away from the business models traditionally deployed by many A&D companies. This is particularly true of the defense sector and the bespoke development model that has historically characterized many defense companies. This model is typified by relatively high cost structures (to carry the burden of cutting-edge development and compliance requirements), long development cycles, and a limited ability to take financial risks such as investing ahead of demand. Some market segments historically favoring the bespoke development model have shifted to favor companies that compete by developing common product lines that can be quickly tailored to a particular end-market's need, or companies that compete by selling a standard product at scale and commercially around the world.

Four types of markets dictate business model need

Bespoke development: Products or services that are developed by customer request and built to their exact requirements. These products are generally large investments that must remain technologically superior for many decades after their construction/implementation and are often built or deployed in small numbers. (Examples: aircraft carriers, next-generation fighters, "one-off" expert-based services)

Highly tailored product line: Products and services that benefit from the cost and speed-to-market advantage of an existing product or service line but require some modification to meet a particular need. (Examples: destroyers, hardened military communications satellites, analytical services)

At-rate product line: Products or services that are produced in a single way and delivered from the assembly line with little to no tailoring. This market requires low-cost structure and delivery schedule stability. Production volumes tend to be in the several 10s to 1000s. (Examples: military transport aircraft, logistics ships, and IT system implementation services)

Global scale and scope: Products and services where price is the primary decision factor. These products and services don't require any tailoring, have stable designs and low costs, are usually produced at very high volume, and are often produced/delivered on a global basis. (Examples: base operations services, logistics trucks, UAS Groups 1 to 3)

Measuring business model coherence

Define the business model for each major A&D market: Using a traditional market segmentation (e.g., nuclear submarines, UAS Groups 1 to 3, ground logistics vehicles), assign an optimal business model based on market needs (see sidebar "Four types of markets dictate business model need").

Define the optimal primary business model for each major business unit of a company: For each major business unit, determine the predominant markets served based on major programs/contracts and the reported or estimated associated revenue. Assign an optimal primary business model based on which market(s) is primarily served.

Determine which primary business model is currently deployed by each major business unit: Based on observations and analysis of public documents, statements, and contract information, assign a primary business model that appears to be deployed for each business unit.

Score each business unit based on coherence between model deployed and optimal model: Assign a "1" for each business unit where the optimal and deployed business model is the same; a "0.67" for those units deploying a model one step removed from an optimal model (e.g., deploying a "highly tailored" model for an "at-rate" market); a "0.33" for a model two steps removed; and a "0" for a model three steps removed.[11]

Calculate a revenue-weighted average of coherence: For each company, use business unit revenue to calculate weighted average business model coherence based on each business unit's score.

These market shifts were prominent in the defense sector starting in the 2000s, when the shift of attention toward countering asymmetric threats required rapid solutions that didn't have to address the sophisticated defenses of a near-peer threat. Companies with business models that allowed them to bring a "good enough" solution much more quickly, often at lower cost, took significant market share during this period.

Over the next few years, the current disruptive forces of technology democratization, globalization, and digitalization will continue to evolve. These trends will likely accelerate market needs away from traditional defense industry models and require defense companies to make significant changes in strategy, business models, and capability investments.

The same forces are at play in commercial aerospace, which is under additional pressure from the need for more rapid product refreshes, most notably in interiors. These disruptions have revealed a gap between business models tuned for time-consuming, holistic redevelopment of product extensions and the market's demand for rapid, less expensive tailoring and refreshing of platforms. Increasing production rates in portions of the large commercial transport model also continue to stress business models tuned for lower rates of production.

The bottom line

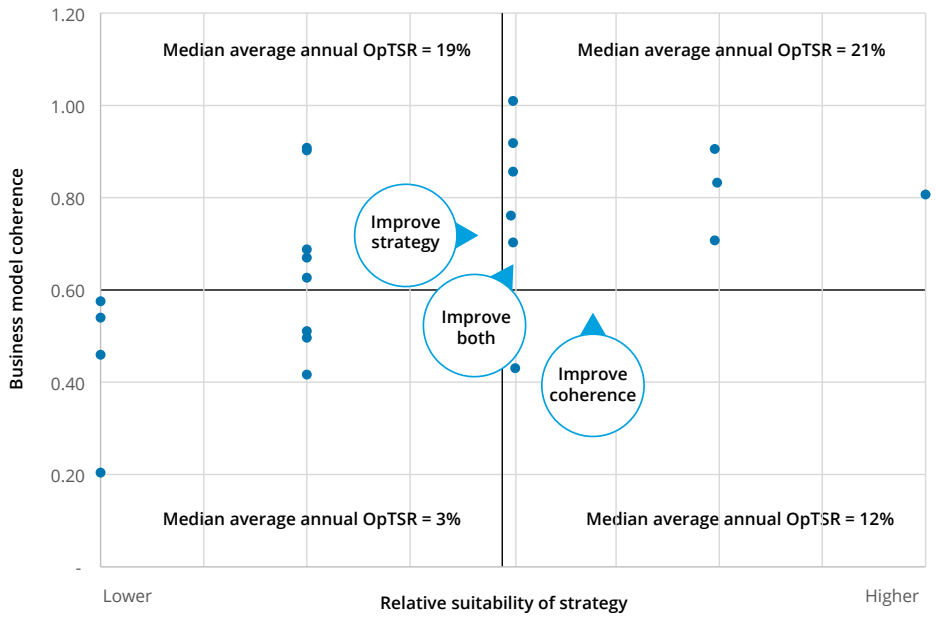
The bottom line is that there is significant financial performance upside for the large portion of the A&D industry deploying business models unsuited to current market needs. This situation is ripe for disruption from new entrants or companies able to retool their business and operating models to meet market requirements. This is of particular importance today as lowered technology barriers and new tools for business execution make it easier than ever for non-traditional companies to serve portions of the market in new, potentially disruptive ways.

Strategy and coherence together: Fundamental change is often required

The right strategy is only as good as the coherence of the business model that implements it. And a coherent business model is only as good as the strategy it executes. This can be measured quantitatively (figure 7), and our analysis shows that:

- Financial performance of companies with better business model coherence and strategies that are more suitable to the environment is superior, as demonstrated by higher OpTSR.
- Conversely, performance of companies with less coherence and strategies less well-suited to the environment is inferior, as indicated by low OpTSR.
- The financial performance of companies with either low coherence or a strategy less well-suited is lower than those scoring well on both.

Figure 7. The performance benefit of optimizing both strategy and business model



Source: Deloitte analysis of S&P Capital IQ, DACIS, company documents and public statements.

Notes: OpTSR is for 2009-2014. Relative suitability of strategy is determined by comparing apparent company strategy deployed vs. historical performance of the strategy, as described above.

These findings indicate that:

- Both strategy and business model coherence are critical to maximizing financial performance.
- A significant portion of the A&D industry faces the need for fundamental change, with many needing to change both strategy and business model(s).
- The rewards are significant for those that make the right strategy and business model choices, with performance improvements of up to seven times possible.[12]

Who is best positioned?

There is a curious dynamic within the A&D industry. Many companies select strategies and deploy business models that suboptimize their financial performance. Why is this? Some may face real financial or strategic constraints that prevent them from making optimal choices. In our experience, some companies simply lack a systematic way of considering strategy and business model alternatives.

Yet other companies suffer from a lack of situational awareness regarding the strategic degrees of freedom they may have relative to others. How much flexibility and capability does the company have to choose a markedly different strategy or deploy a different business model(s)? And how are competitors situated? A company will often spend much time and effort understanding its position within the markets it has chosen to serve. It often spends less time evaluating how well positioned a company and its competitors may be to make moves that shape the market.

Taking the traditional approach to viewing the industry doesn't help companies if they are interested in doing things differently.

The traditional approach to viewing the industry

Taking the traditional approach to viewing the industry doesn't help companies understand their positioning if they are interested in doing things differently.

TSR or OpTSR is a good way to measure past performance. Traditional financial metrics such as return on assets or enterprise value relative to capital are certainly reasonable measures of performance at a particular period of time. But these are poor *predictors* of performance and future potential, demonstrating little to no correlation between value at time=0 and performance over subsequent years.[13]

Furthermore, traditional approaches to segmenting the A&D industry, such as by tier (e.g., prime contractor, tier 1, tier 2), don't provide a great deal of insight into the strategic choices senior leadership should make.

Overall, none of the traditional ways of describing and segmenting the A&D industry, financial or otherwise, tell us much about how portions of the industry *are positioned to succeed* (or not). They don't tell us which companies *are in a position of power to shape their environments or what capabilities a company may need* to outperform its peers.

Better insight: Financial capacity and strategic flexibility

There is a better approach to characterizing a company's degrees of freedom for choosing a markedly different strategy and/or business model(s). At least two factors come into play: *financial capacity* and *strategic flexibility*.

Financial capacity defines to what extent a company has the financial strength to shape its position in an evolving market and perhaps to shape the market itself; for example, by a major investment in organic or inorganic repositioning or consolidation. Strategic flexibility defines the degrees of freedom a company has in terms of shaping its own or the market's position; for example, whether a company can fundamentally redefine its position or is constrained to small, incremental steps. Ultimately, these two factors limit the set of choices a company has on the strategy game board.

Financial capacity

Financial capacity estimates the level of a company's resources to make organic or inorganic moves to effect its chosen strategy. Three metrics, when combined, provide a realistic view of a company's financial capacity:

Cash/revenue (3-year average): The "dry powder" a company has on hand to make strategic moves. These are the quickly liquefiable assets that make moves possible. (Although, of course, having significant cash on hand can also make a company an attractive acquisition target.)

Retained earnings/revenue (3-year average): Indicates whether a company is generating profit that contributes to financial capacity or is spending or distributing profit elsewhere.

Revenue growth (3-year LSGR): Indicates financial momentum by measuring whether cash flow is being sustained and grown. Note that "LSGR" indicates Least Squared Growth Rate, which is preferred to compound annual growth rate (CAGR) as a measure of a multi-point trend.

These metrics don't reflect the absolute amount of resources available to a company but rather the normalized amount (e.g., retained earnings divided by revenue). After all, a small company may need fewer resources to make a big move in its market(s) while a larger player may need significantly more resources.

Strategic flexibility

Strategic flexibility approximates the ease with which a company can make major strategic shifts or move into new markets or customer types without the likelihood of being punished by the investment community. A company with greater strategic flexibility has more choices available.

There are no off-the-shelf metrics that measure strategic flexibility. From our analysis, we have found that three proxy metrics, when combined, provide a balanced indicator of a company's strategic flexibility:

Portfolio mix: A proxy measure of how free a company is to pursue new avenues beyond what it has traditionally produced. For the A&D sector, we describe this as the non-defense percentage of a company's A&D revenue. It's based on extensive historical evidence showing that it's more difficult for a company focused on defense to "diversify" than it is for a company focused on commercial aerospace or other commercial markets.

Market leadership: A proxy measure of the wealth of strategic choices available to a company. It describes the degree to which a company holds sustained, leading positions in the markets it serves, given that leading companies have a greater wealth of strategic choices available than non-leaders, which generally must react to the leaders instead of setting their own agendas (disruptive new entrants excluded). This metric is an approximate measure of the percentage of a company's revenue associated with number one or number two market positions.

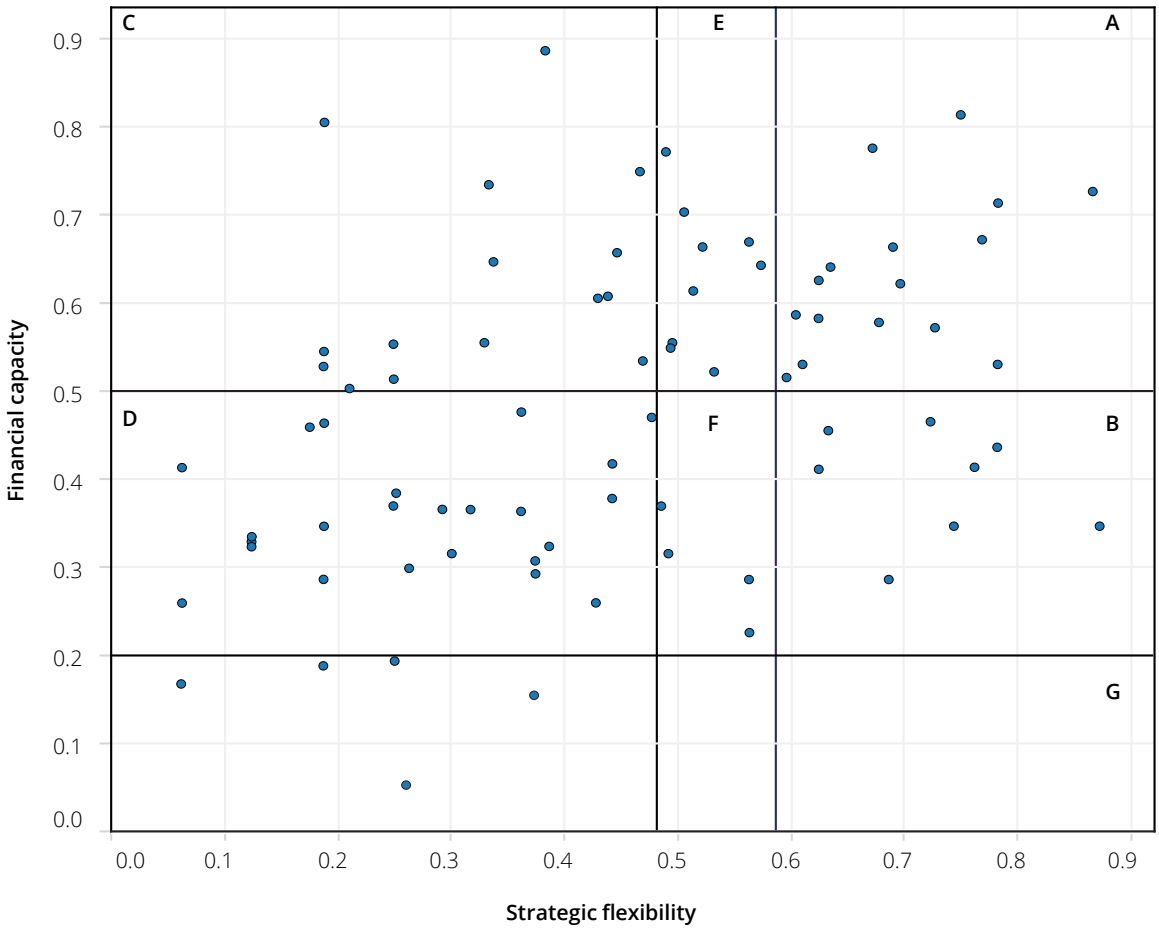
Market permission: A rough approximation of the ability a company's leadership has to make bold moves. It estimates the degree to which the company's current leadership team has made notable moves over the past few years that have been viewed favorably by the investment community, either to reposition itself or to solidify its existing position.

Evaluate financial capacity and strategic flexibility for a better way to see which companies are in a position of power to shape their environments.

Which companies are best positioned?

What do financial capacity and strategic flexibility tell us about how well positioned companies are to make differentiating moves? We segmented companies using these metrics (figure 8) to identify natural groupings of companies. This analysis isn't a measure of past performance, nor does it select "winners" or "losers." It's designed to indicate the potential that companies and their competitors have to succeed over the next few years by showing how free they are to make shaping moves in the market and whether they have the resources to do so.

Figure 8. A&D industry segmentation



Source: S&P Capital IQ, DACIS; company public financial statements, public statements, annual reports, analyst presentations; Deloitte analysis.

Note: Financial capacity is weighted average 50% cash/rev, 25% ret earn/rev, 25% rev growth; strategic flexibility is weighted average 50% portfolio mix, 25% market leadership, 25% market permission.

Seven segments of the A&D industry

Based on our analysis, we define seven segments of the A&D industry:

A: Have the financial capacity and strategic flexibility to make the most varied and notable moves. They are often high-performing conglomerates or commercial aerospace-heavy companies with strong financials.

B: Have a good degree of strategic flexibility given their portfolios, their positions within markets, and/or the performance of their executive teams. Typically known for their heavy mix of commercial aerospace, their relatively lower financial performance has left them with limited capacity to make notable moves.

C: Have the financial capacity to make substantive strategic moves, but their heavy mix of defense positions limits the nature of moves to those closer to defense or heavily regulated markets. These tend to be financially higher-performing defense specialists.

D: Limited in terms of the nature of their moves and more financially constrained to make moves than defense-heavy counterparts in segment C.

E: Have the financial capacity to make substantive strategic moves and more strategic flexibility than a typical defense-heavy company, although not as much flexibility as high-performing, commercial aerospace-heavy companies. These companies typically either have a mixed portfolio or are very high-performing defense companies.

F: Have the strategic flexibility of segment E largely given their portfolio mix, but less financial capacity to make substantive moves. Typically, these are relatively lower-performing commercial aerospace companies or companies with a defense-commercial portfolio mix underperforming their peers.

G: Highly financially constrained companies relative to their competitors despite the fact that they may or may not have strategic flexibility. There may be some in this segment who recently underwent an acquisition or spinoff that left the company with limited resources.

The bottom line

Some companies lack the informed situational awareness of how much freedom they and their competitors have to make decisions beyond the incremental. Traditional views of the industry don't help. Looking at the industry through a lens of financial capacity and strategic flexibility provides insight into a company's potential and that of its competitors. It helps to identify the types of actions a company should take to outperform its competition.

Putting it all together: How to outperform the industry over the next 10 years

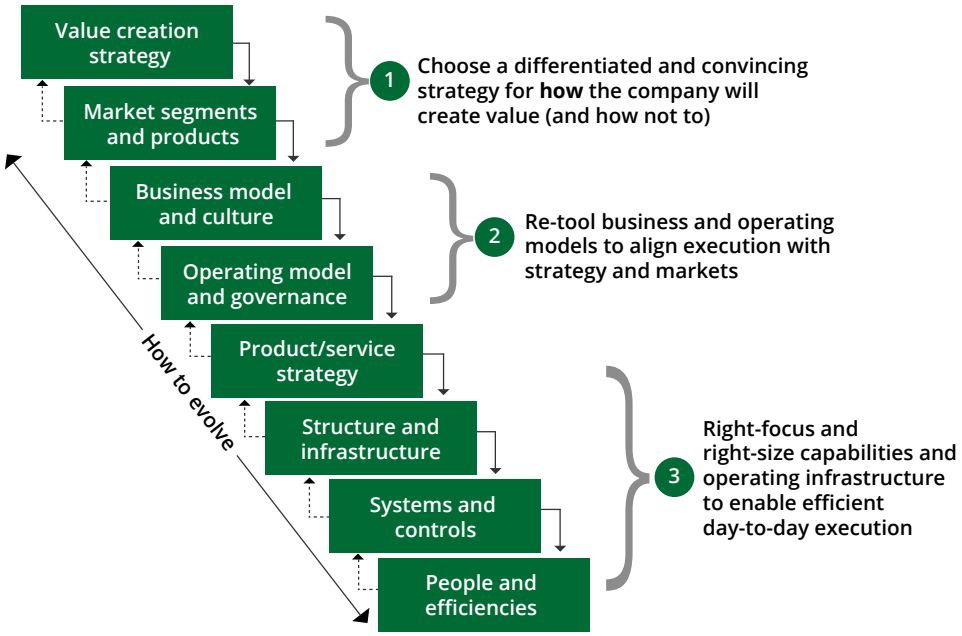
A company's performance is demonstrably dictated by the strategic choices it makes and how those choices are executed (figure 9). To outperform the A&D industry over the coming years, companies will have to do the following or run the risk of being marginalized:

1 Choose a strategy that actively creates value rather than simply staying the course. This has shown the potential to demonstrably outperform other strategies and takes into account the company's degrees of freedom relative to competition.

2 Deploy a business model(s) that reflects the true needs of chosen markets today and is nimble enough to proactively adapt for evolving needs.

3 Stop the death spiral of running faster just to keep up. Innovate new capabilities, business models, and operating models that break the traditional constraints of the past and radically improve affordability for markets facing increasing competition and commoditization.

Figure 9. Strategy choice cascade



A company's performance is demonstrably dictated by the strategic choices it makes and how those choices are executed.

1 Choose an active strategy that demonstrably outperforms

Although an individual company's choice of strategy is usually unique to its specific situation, there are certain strategies that enable better financial performance than others. Some companies and/or their competition have more flexibility to choose certain strategies. Table 2 illustrates a highly simplified summary of the attractiveness of strategies in a downturn versus an upturn and the relative availability of a strategy to a company in a particular segment.

For example, a company in a market downturn is likely to have better success consolidating excess capacity in its market rather than staying its current course. This said, companies with greater degrees of strategic flexibility and financial capacity also have the choice of fundamentally repositioning themselves into adjacent or even more diverse markets (in the case of more commercially centered companies) as long as they recognize the higher risk associated with these moves.

Table 2: Simplified applicability of strategies

Relative attractiveness of strategies[1]	Stay the course	Do more with core	Expand into adjacencies	Consolidate	Restructure portfolio	Diversify	Exit/sell
Downturn	-	?	+*	+	+*	-	+
Upturn	+*	?	+*	+	+*	-	?
Availability of strategies by segment							
A	✓	✓	✓	✓	✓	✓	✓
B		?	✓	✓	✓		✓
C	✓	✓	✓	✓	✓		✓
D		?	✓	✓	✓		✓
E	✓	✓	✓	✓	✓	?	✓
F	✓	✓	✓	✓	✓		✓
G		?	?	?	✓		✓

[1] "+" indicates a relatively good strategic choice; "+*" can be a good choice, but carries significant downside risk; "-" is a choice typically associated with lower success; "?" indicates insufficient data to determine.

Source: Deloitte analysis.

Companies that find themselves in a particular segment should consider these strategies:

A: Look for inorganic or organic growth in all scenarios, including consolidation, strategic repositioning, or portfolio restructuring moves. Since choices are relatively unconstrained, these companies should shy away from passive strategies. Fundamentally, they can use their positions to reshape the market itself if required—or valuable—to do so.

B: Consider performance improvement strategies under all scenarios and consider expansion into adjacent markets or consolidation. It's important to make the most of core positions, for example, by seeking to secure market "choke points" such as particular technologies.

C: Deploy active strategies to consolidate portions of the market and expand into well-chosen adjacent markets both organically or inorganically. Diversification strategies are generally not recommended for these companies, and portfolio restructuring should be approached cautiously. Shy away from passive strategies.

D: These companies are somewhat at the mercy of defense budgets. They will have to choose whether to become a utility or to move to a more differentiated position. Regardless of upturn or downturn, they will need to consider performance improvement/transformation strategies.

E: Avoid passive strategies and use their strong position to reshape the market itself if it's required or valuable to do so.

F: Use their relative strategic flexibility to improve financial performance while repositioning themselves into more attractive adjacencies either by organically shifting investment across their portfolio or by smaller, inorganic consolidation or repositioning moves.

G: These companies can decide to either work their way out of their current position, take action to secure a high price as an acquisition target, or possibly become an acquirer (e.g., pruning outside the core, selective R&D/program investment, tax-efficient restructuring).

2 Deploy a business model that reflects the true needs of chosen markets

Choosing the right business model to support the strategy and serve chosen markets affects performance. The first step in choosing the optimal business model is to truly understand what business model(s) is required for markets a company serves, to recognize that this may not be static, and then to determine how elements of its business and operating model(s) have to evolve. Although a thorough treatment of business model characteristics and their requirements for different markets is left to a future paper, we outline below a few of the more major considerations as illustration (see table 3 on the next page):

- Basis of competition: what the market demands.
- Value proposition: how value is provided to the customer(s).
- Cost structure: how much cost is required and how cost is managed to enable the value proposition.
- Risk model: level of exposure to specific types of risks and the approaches to mitigation.
- Investment approach: what mechanisms and level of investment are required.

3 Right-focus and right-size capabilities for execution and innovation

To support a differentiated strategy and optimal business model, companies need to make deliberate choices about capabilities. They should limit the number of capabilities they invest in, concentrating on those that truly differentiate them and withholding investment for those that don't. Of course, they will still have to invest in some less strategic capabilities to maintain operations, for example, compliance.

Why is re-examining a company's capabilities of particular importance at this moment?

- The needs of many markets have shifted away from the business models and associated capabilities of a large portion of the A&D industry, as discussed above.
- The underlying level of demand is likely changing, with a potential softening in portions of commercial aerospace and a slight increase in defense.
- The industry is experiencing a set of truly disruptive factors that fall into three categories: changes in the nature of business execution, changes in the macro-environment, and changes in customer expectations and market needs.

Together, these suggest a) a potential for significant disruption to the industry and b) an opportunity and perhaps requirement for companies to invest in capabilities to capitalize on or defend against these disruptive forces.

Re-examining a company's capabilities is of particular importance at the moment. Companies need to decide how to capitalize upon or defend against disruptive forces.

Table 3: Example business model considerations for four types of markets

	Markets			
	Bespoke development	**Highly tailored product line**	**At-rate product line**	**Global scale and scope**
Example markets	• *Aircraft carriers* • *Next-gen fighters* • *"One-off" services*	• *Destroyers* • *Hardened military comms satellites* • *Analytical services*	• *Transport aircraft* • *Logistics ships* • *Many IT implementation services*	• *Logistics trucks* • *UAS Groups 1 to 3* • *Base operations services*
Basis of competition	Technology/capability superiority for decades post-deployment	Leading technology balanced with cost and speed to market	Cost-effective technology with schedule stability	Price and speed to market
Value proposition	Exceed specifications almost regardless of price and schedule	Provide a technically superior offering within a reasonable range of schedule expectations at a fair price	Provide a technically acceptable offering on schedule and at a market price	Provide a low-cost, off-the-shelf solution whenever required
Cost structure	High: Ensure cutting-edge technology superiority and cover the significant cost of compliance and oversight	Moderate: Capture benefits of product line/architecture while maintaining technological superiority in targeted areas	Moderate to low: Capture full benefits of rate production	Low: Scale-based approach to minimizing cost structure
Risk model examples (focus of risk mitigation)	• Technology • Program execution • Reputation	• Technology • Program execution • Product architecture	• Market needs • Forecasting • Supply chain risk	• Cost • Supply chain risk • Forecasting
Investment approach	Largely customer funded, directed at most critical areas of technology requirements and major program capture	Mix of customer- and internally funded, directed at technology "choke points" and product architecture	Internally funded investment in product-line development and roadmap extensions ahead of demand	Internally funded investment in product lines and process cost reduction

Disruptive factors: The nature of business execution

By many measures the early stage of the fourth industrial revolution is here, one of smart automation and connectedness. Additive manufacturing and predictive analytics will fundamentally shift the cost structure and power centers across elements of the value chain. Companies that don't proactively address these trends could find themselves marginalized or extinct.

Democratization of technology/speed of innovation: Sustainable technology superiority has historically been the hallmark of most competitive strategies within the A&D market. This barrier is rapidly eroding in some areas. Technology has simply become more accessible to a wider cross section of our planet, spurred on by the Internet, electronic miniaturization, and software advances. This is quite visible in portions of the space market, for example. These factors have converged to unleash a host of almost garage-based manufacturers to attack the traditional satellite manufacturer and operator businesses. The commercial aerospace industry isn't immune either. The duopoly of large commercial transport aircraft manufacturers is under threat from competitors in multiple countries.

Questions to consider: How to maintain technology barriers? What strategies are needed to anticipate, shape, and react to technology needs? How can innovation be accelerated?

Business ecosystems and globalization: Not only is technology more accessible, collaboration is as well. It's become increasingly easy to work virtually with complementary businesses, whether they're down the street or across the planet. Companies can develop dynamic ecosystems of partners tailored to market needs to rapidly deploy differentiated capabilities. For the A&D industry, this has led to a breakdown of some global barriers to doing business. One result has been that some US A&D companies have lost share to their European counterparts even as supply chains have globalized and non-home country markets have become increasingly important.

Questions to consider: How can ecosystems be developed and adapted to improve business nimbleness? With what partners? Which business models and structures are required to compete effectively globally?

Industry 4.0/digitalization: These terms are shorthand for what is a broad and still somewhat loosely defined area of advances in how products and services are developed, produced, and supported. These advances can be thought of as translating physical items to digital information (smart development, manufacturing, and connectivity), translating digital information into other digital information (intelligence and insights), and translating digital information back to physical action or items (digital development and manufacturing methods). For manufacturing industries such as A&D there are six areas where advances are being made and will continue to be made: 1) creating smart products and services, 2) connecting and integrating with customers in new ways, 3) accelerating engineering and design cycles, 4) predicting changes and responding in real time, 5) creating a digital link between operational technology and information technology, and 6) automating and scaling aftermarket operations. These advances will have significant impact on everything from the cost structure of the value chain to where power lies.

Questions to consider: Which areas are most critical to create new revenue streams, augment existing revenue streams, reduce cost, and mitigate risk? Which business models and capabilities are needed to do so?

The role of organization and human capital: The A&D industry's traditional organization and talent models no longer support an industry that has adopted more modern ways of working. Furthermore, the industry is experiencing the realities of a markedly different workforce. The industry needs organizational models that allow companies to absorb new capabilities more quickly and react faster to changes in demand. It needs talent models that better address the limited supply of highly specialized workers and leadership models that develop and advance business leaders, not only program managers. Moreover, the traditionally hierarchical culture of the A&D industry is out of step with new tools for business execution and with much of the younger workforce today.

Questions to consider: How should organization and talent models change to support strategy, business model, and capabilities? What leadership capabilities are required? What elements of behavior and culture are critical to driving differentiated strategy and business model(s)?

Disruptive factors: Changes in the macro environment

Rise of the global middle class: The creation of a well-off middle class across portions of the globe, most notably in highly populous China and India, has already unleashed tremendous change across many industries. In A&D, this is most apparent in commercial aerospace, where the demand for air travel by a population suddenly able to afford it has driven enormous growth. But this trend will also impact other segments of the A&D markets. There's new demand for space-based services. Countries will increasingly have the requirement for and monetary wherewithal to assert and defend new geopolitical and resource claims. With significant upside left for middle-class growth globally, we're just beginning to see the impact of this trend on the A&D industry.

Questions to consider: How does the rise of the global middle class create threats as well as opportunities for your business? Are there innovative strategies and business/operating models to address them?

Proliferation of threats and geopolitical instability: The current national security environment is more unstable than at almost any point in recent memory. From the strengthening of real or perceived near-peer threats to US and Western Europe, to non-state actors, to individuals wielding either bombs or computers, physical and virtual threats have become a part of daily life. While a cynic would say that this type of environment creates significant opportunity for the defense sector, it's clear that the national security establishments of countries across the globe have yet to fully determine how to re-gear themselves to address the current environment. Much like the shift in certain markets away from traditional A&D business models, the environment has been shifting away from traditional approaches to managing it.

Questions to consider: What physical and virtual threats and opportunities for your business does the geopolitical situation create? Does strategy need to shift? What business models are required to compete in the new environment?

Disruptive factors: Customer expectations and market needs

Program performance and competitiveness: In an industry that designs and produces some of the most complex hardware, software, and services in the world, program performance is expected by some to suffer occasionally. But over the coming years program performance and cost competitiveness will become more and more of a focus given increasing competition in the commercial airframer market, demands for increasing competition by the US Department of Defense, and enormous structural costs in the defense establishment that will lead to sustained budget constraints.

Questions to consider: Who is your true competition today and tomorrow? How can you maintain current program positions by improving program performance in the short and long term? What can you do to demonstrate a sustained commitment to and focus on program performance?

Expectation of the immediate (mobility and connectedness): Much has been written about the "on demand" expectations of today's consumers. Some of these expectations are starting to be addressed by the industry—for example, through commercial aircraft interiors offering in-flight entertainment and connectivity options. But in an environment where both the virtual (e.g., information) and the physical (e.g., car service) are expected whenever and wherever we want, it's only a matter of time before other segments of A&D feel the pressure to respond, for example, persistent UAS or space-based coverage and on-demand intelligence to forward-deployed troops for defense CONOPS.

Questions to consider: How can the concept of "immediate" be incorporated as a benefit or viewed as a threat to current products/services? What opportunities might there be to disrupt current or adjacent markets? What are the implications for business and revenue models?

These trends will fundamentally change the way the A&D industry is structured, operates, and performs. Some companies will find themselves suddenly disrupted by new or existing competitors wielding new capabilities. Other companies will have the foresight to invest in capabilities that will allow them to move beyond just keeping up by "running faster" to fundamentally break the bonds that constrain their strategies and business models today.

These trends will fundamentally change the way the A&D industry is structured, operates, and performs.

A final word on the case for strategy and business model innovation

A&D company strategies have historically revolved around technology leadership that requires heavy investment and long development cycles. This fundamental basis of competition has remained little changed for years.

But increasingly over the past 10 years—and accelerating dramatically today—the same capabilities are being delivered more quickly and at lower cost in many portions of the industry. The inevitable march of commoditization appears to have finally arrived at portions of the A&D market's doorstep. The source of cutting-edge technology and innovation has been shifting away from government and defense toward commercial. These changes have given rise to a new set of competitors. They are shaking the foundation upon which many A&D companies have based their strategies. And while many companies have not yet embraced this fundamental disruption in the fabric of the market, forward-looking companies are today rethinking the assumptions on which they typically base their strategies.

The bottom line

Making better strategy and business model choices demonstrably improves financial performance. But "running faster to keep up" may be a grossly insufficient strategy in the face of today's fundamental market disruptions. Rethinking the constraints that are the basis upon which strategy and business model decisions are made today will be the hallmark of those companies that are truly poised to outperform the A&D industry over the next decade.

Endnotes

1 Deloitte analysis of S&P Capital IQ, Compustat, DACIS, company annual reports and public statements
2 Deloitte analysis of S&P Capital IQ, Compustat, DACIS, company annual reports and public statements
3 Deloitte 2016 global aerospace and defense sector financial performance study; Deloitte global defense outlook 2015; Deloitte US aerospace & defense labor market study
4 S&P Capital IQ and Compustat; Deloitte analysis
5 S&P Capital IQ and Compustat; Deloitte analysis
6 Deloitte analysis of S&P Capital IQ, Compustat, DACIS, company annual reports and public statements
7 S&P Capital IQ; Deloitte analysis
8 OpTSR = $\{[[(S_1/S_0)*(P_1/P_0)]^{[1/(Y_1-Y_0+1)]}]-1\}$, where S_1 = ending number of shares, S_0 = beginning number of shares, P_1 = ending share price, P_0 = beginning share price, Y_1 = end year, and Y_0 = beginning year
9 Source: For OpTSR, Deloitte analysis of S&P Capital IQ data. For business model coherence, Deloitte analysis of current business model practices of the major business units of the largest A&D companies based on company public documents, public statements, and other industry analysis. Note: Correlation coefficients overall = 0.59; Commercial platform integrators = 0.77, Defense platform integrators = 0.85, Tiers and propulsion = 0.62.
10 S&P Capital IQ; company statements and documents; Deloitte analysis
11 Deploying a "bespoke" model for a "highly tailored" market receives a 0.33 and for an "at-rate" market receives a 0
12 Deloitte analysis of S&P Capital IQ, DACIS, company documents and public statements
13 Deloitte analysis of S&P Capital IQ and Compustat data

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