After the COVID-19 Pandemic – How the Structural Crisis Can Be Overcome

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Summary

The aerospace industry is experiencing a severe culture shock in the COVID-19 pandemic, after flourishing demand and booming business over the last decades. The reduction in production volumes will cascade from OEMs to the rest of the value chain, taking in all supply chain tiers and service providers. All industry stakeholders will need to adapt their production operations to the new environment, to avoid bleeding unnecessary cash and risking going out of business. Current government aid programs tend to slow down the necessary re-shaping of the aerospace supply chain. Short time working and other state programs merely bridge the immediate impact of the COVID crisis but should not be confused with long-term solutions. Full recovery of demand in the aerospace industry is not likely to happen until after government programs expire. The industry should proactively prepare itself and be "fit for ramp-down" in order to adjust the capacities and cost base as required, depending on the crisis recovery.

For decades, the aerospace industry has been flourishing, with near-exponential growth since its beginnings in the 1950s and 1960s. Past downturns such as the 9/11 terror attacks, SARS or the financial crisis in 2008/09 had no lasting effect on the overall growth trajectory. However, the impact of the COVID-19 pandemic is unprecedented. It brought commercial aviation to a standstill for months. The maximum monthly RPM (Revenue Passenger Mile) reduction due to COVID was over 75% leading to a significant global annual reduction. 9/11, by contrast, resulted in a maximum monthly RPM reduction of 45%, focused locally on the North American market, but just a 3% global annual RPM reduction in 2001 (Figure 1). Unlike in previous crises, the whole supply chain has been impacted: in 2020, commercial aviation sales collapsed by up to 70% globally [AlixPartners2, 2020].

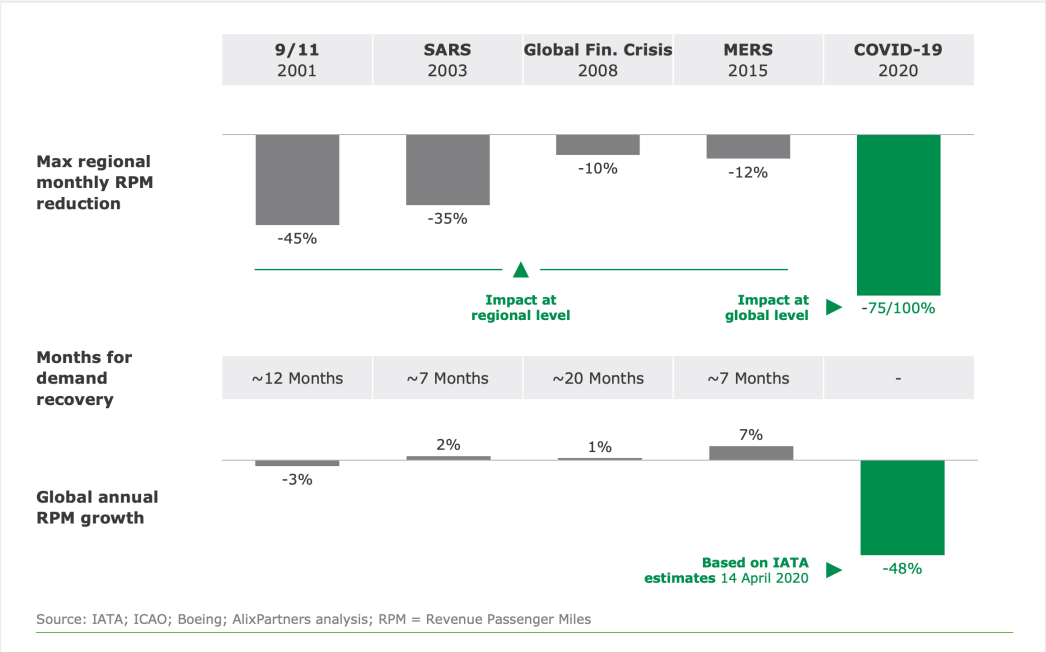

Figure 1: Impact of crises on air travel demand

Impact on Airlines, MRO and Aviation Services

Airlines and their affiliated service companies (MRO, catering, ground services) were the first to be hit by the pandemic. Travel bans and restrictions, accompanied by lockdowns, took effect from end-March 2020. Airlines consequently went into severe cash preservation mode: reducing flights, putting the workforce onto short time arrangements, mothballing or even advancing the retirement of entire fleets, and ultimately requesting state aid. Worldwide, airlines received multibillion-dollar support packages. At the same time, several airlines went bankrupt in circumstances where state subsidies requested were not granted [Reuters, 2020].

Connected services like MRO and aviation services accordingly found themselves in trouble. For MRO players, falling demand for aircraft maintenance, spares and other services resulted in a drop in revenue in 2020 of over 60% [AlixPartners, 2020].

Impact on OEMs, Tier 1s and Suppliers

Demand drops subsequently hit the aircraft industry with a slight delay, but with full force. Deliveries of Airbus and Boeing are expected to collapse by 40– 60% in 2020 compared to previous years, and recovery is likely to take several years. After a low point in 2020 and 2021, aircraft deliveries are not likely to recover to pre-crisis levels before 2024/25 (AlixPartners2, 2020).

Consequently, the full commercial aerospace supply chain has been heavily impacted by the reduced production rates. OEMs requested state aid and announced significant headcount reduction programs. Aerospace suppliers had to deal with sudden demand drops and the resulting liquidity shortage, aggravated by long lead times in the supply chain. Additionally, efficiency dropped due to operative impairments such as decoupling of production shifts, physical distancing on the shop floor and in offices, and quarantines in case of positive COVID results.

The defense-related aerospace industry has been insulated from demand decline so far, but complete shutdown of international traffic and transportation caused disruption of global value chains (Mehta, 2020). It has meant that certain suppliers were able to offset losses in the commercial segment by accelerating military business.

Recovery Scenarios

After the full impact of the pandemic unfolded in 2020, a number of forecasts estimated the recovery duration and pathway for the airline and subsequently the commercial aircraft industry. Best cases assume recovery by 2023. In a worst-case scenario, recovery is not expected before 2028 (Figure 2). All industry experts seem to agree however, that we are dealing with a crisis of unprecedented magnitude which will have lasting effects [Rollins, 2020].

Recovery in demand for air travel – and therefore for new aircraft – is likely to be impacted by certain key drivers. In the current situation, the most important aspect in increasing global travel activities is the availability and effective deployment of a vaccine against the virus.

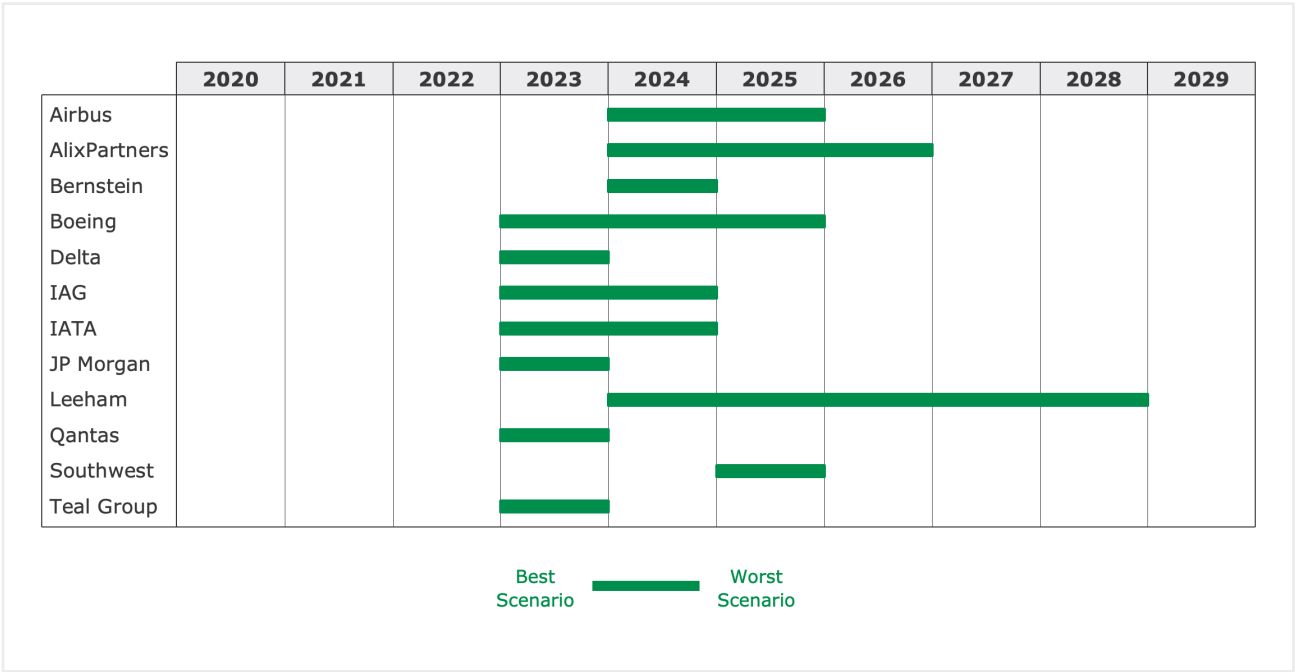

Figure 2: Overview of forecasts to recovery of Pre-COVID levels

	Family	Orders	Orders at Risk	Adjusted Orders	Share at Risk
Narrow Body	Airbus	6,615	828	5,787	13%
	Boeing	4,164	709	3,455	17%
	Total	**10,779**	**1,537**	**9,242**	**14%**
Wide Body	Airbus	886	272	614	31%
	Boeing	996	65	931	7%
	Total	**1,882**	**337**	**1,545**	**18%**

Table 1: Airbus and Boeing order books at risk

A second crucial driver for the aerospace industry is passenger confidence. Gradual relaxation of flight restrictions will start only if the required sanitary or other confidence-boosting measures, like pre-flight testing, are implemented. Demand for travel activities is also likely to be impacted by the depth and length of the economic recession. A faster recovery is likely to increase demand for business travel sooner.

Additionally, the availability of viable financing options for airlines either from private companies (e.g. banks, lessors, agencies) or via government support is crucial in recovering demand for aircraft. The potential return to service of the 737Max (with stocks currently around 450 aircraft) will also impact the supply chain, delaying demand for new aircraft.

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Crisis Impancts the Whole Aerospace Supply Chain

The fall in demand for air travel, the resulting critical financial situation for airlines and the unclear path to recovery, have impacted the total supply chain. Leisure travel is likely to take several years to fully recover and business travel may never revert to pre-crisis levels, given greater acceptance of virtual solutions. Airlines have already started to restructure their business models and fleets, looking to defer acceptance of aircraft. Moreover, impending bankruptcies of airlines and lessors put 10 – 20% of orders at risk (Table 1) [Leeham, 2020].

Declining demand increases pressure on an aircraft supply chain which already required consolidation and restructuring. Even pre-crisis, it was characterized by an overgrown and complex structure, with many undersized companies on Tier 2/3 level and generally poor financial performance [AlixPartners3, 2019]. Low diversification of cost footprints, a significant high cost share, above-average personnel costs and high fixed costs intensify the effects of the demand drop for OEMs and suppliers. The low-demand situation creates an additional risk for the supply chain and could make strategic alliances with important suppliers necessary in extreme cases. To avoid delivery issues, a back-up plan is required to ensure to ensure delivery capability.

Supply Chain Consolidation

In recent years, attempts at consolidation were mainly driven by the large aircraft OEMs. Boeing established the strategic concept of "Focus Factories". This concept aims to use a platform-like approach to achieve economies of scale and drive operational excellence. Supply chain complexity was significantly reduced, and management became much easier. The number of existing suppliers in the network, for example, was reduced by approximately

50%. Market consolidation was accelerated as a result. In addition to workload aggregation, the contract structure was adapted to ensure better transparency of the entire supply chain for Boeing. The supply chain approach was strongly influenced by the "build to print" model.

There is therefore an opportunity to accelerate supply chain consolidation, in line with the desired target supply base.

It is flanked by the intention to push ahead with further development and continuous improvement to achieve competitive advantage [Brothers, 2019].

Airbus also began to significantly streamline its supply chain. For some modules, partnerships for development and industrialization were established with a small number of Tier 1 suppliers, leading to monopoly-like positions for these suppliers. For other modules, the supplier base was expanded in line with the build to print concept to achieve cost reductions. Some critical activities – following the "Chamber of References" principle up to part level – remained in-house. The goal was to continue technology leadership and cost structure control, and thus be able to audit suppliers and determine the conditions along the value chain [Beelaerts von Blokland & Santema, 2010].

Neither concept has led to a stable supply chain. The current crisis reveals the problems of highly fragmented, small suppliers, while the level of fragmentation and supply chain robustness varies segment by segment. In general, however, limited financial resources and low vertical integration put many suppliers at risk.

There is therefore an opportunity to accelerate supply chain consolidation, in line with the desired target supply base. As the legacy set-up is characterized by few direct suppliers to the OEMs, increasing vertical integration of OEMs and Tier 1 supplier to grow market share could be an option. To ensure competitiveness, fixed cost reductions and footprint adjustments are likely to be required.

European suppliers in particular often have a high fixed cost structure, partly due to the underlying footprint and making it more difficult to achieve a competitive cost structure. Evolved structures and historical decisions have created or added sites, with frequently complex plant configurations. Specialization is rare and mixed footprints common. Over-capacity caused by the COVID-19 demand drop increases the pressure on suppliers to act. Analysis of the supply base of a typical European OEM shows that 89% of its supplier plants are located in high-cost countries (Figure 3). Compared to other industries (e.g. the automotive industry), the resulting best-cost ratio is low. These results indicate further potential for suppliers to adjust their footprint to increase competitiveness and respond to increasing

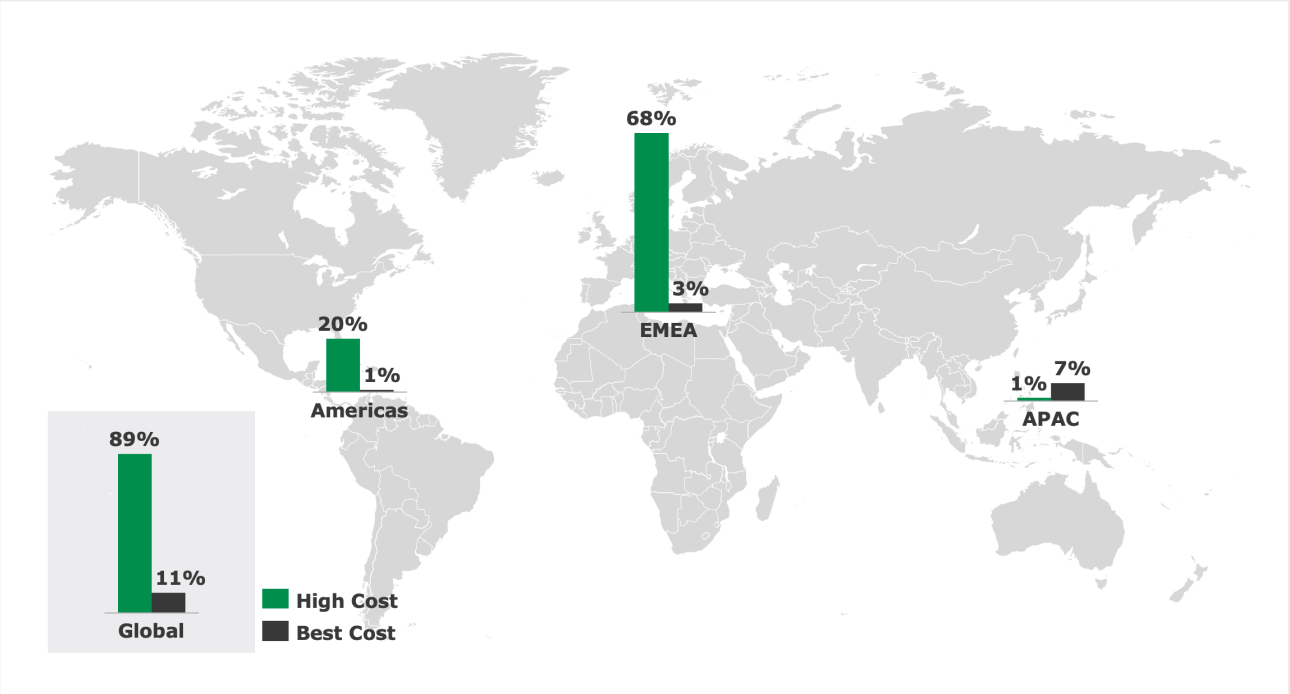

Figure 3: Supply base of typical European OEM (number of production sites by region)

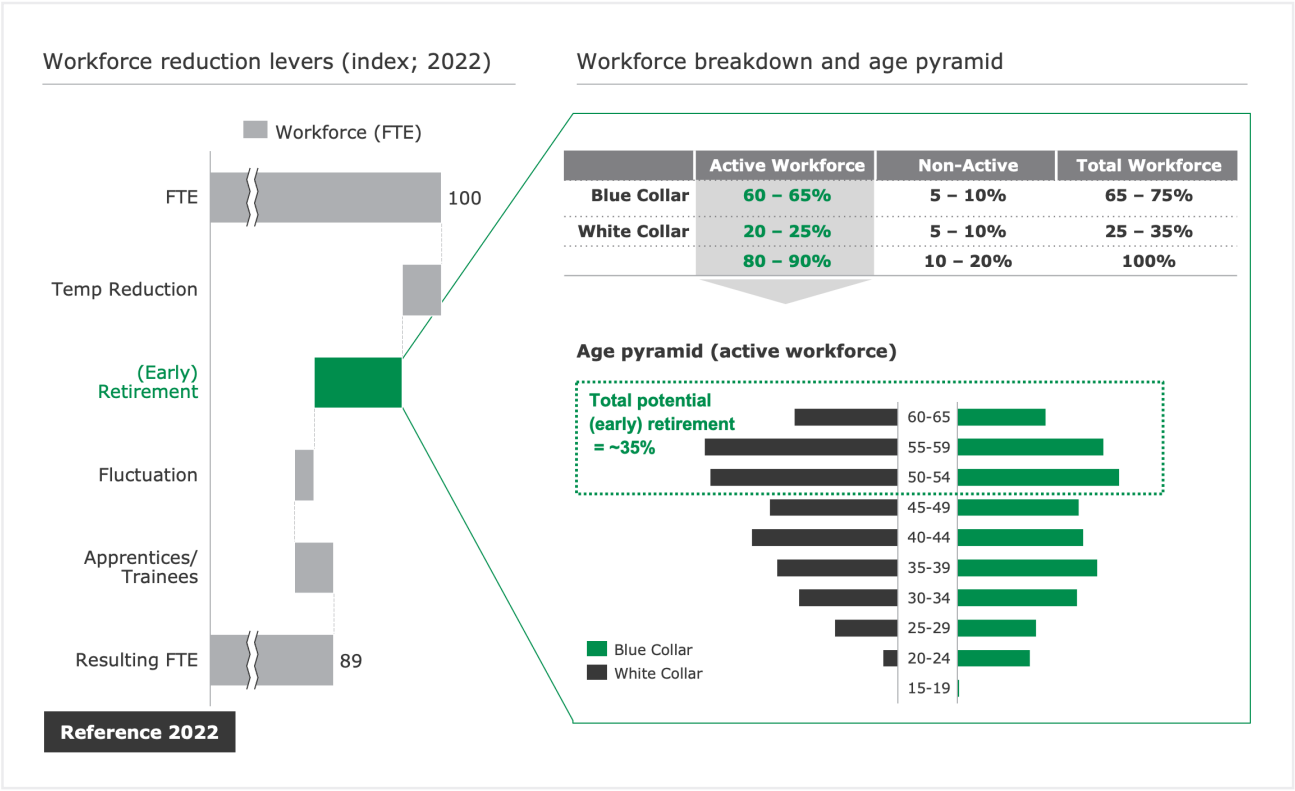

Figure 4: Workforce reduction levers and typical age pyramid

price pressure. Alongside overall production cost management, efficient personnel cost management is vital for sustainable competitiveness.

Structural Change Required

Most companies cut their temporary workforce to a minimum as an immediate reaction to the crisis, although this was usually not sufficient to compensate for the sudden drop in demand. To mitigate the impact on the core workforce, government measures such as short-time working have been established in many countries. However, government support is not likely to last until demand fully recovers, and further staffing reductions will necessarily impact the core workforce. As government support is withdrawn, companies are likely to be forced into ensuring sustainable workforce reductions by pulling common levers like early retirement, natural churn fluctuation and, as a last resort, forced layoffs. Taking on apprentices and trainees has the opposite effect but might be necessary to ensure a desired age pattern.

In Germany, based on common age pyramids in its aerospace companies, voluntary programs will account for a significant portion of layoffs. Around 35% of the total workforce are eligible for early retirement programs, and projections anticipate a take-up ratio of one in three. A further reduction of about 10% could come from additional measures – including reducing the remaining temporary workforce, natural churn and taking on apprentices. Given a sustained workload reduction in 2022, the ending of the German short time working agreement will require additional workforce reductions which will most likely lead to forced layoffs (Figure 4).

To reduce the social impact of forced layoffs, immediate preparation and implementation measures such as transfer or qualification companies are advisable, to ensure both social acceptance and cash containment for companies by drawing on government support.

Industrial setup, workforce adjustment and footprint optimizations will all be on the table to ensure business continuity.

The resulting downsizing of the workforce will lead to companywide organizational adjustments and process re-designs to keep the business running with a reduced headcount.

Government aid helped to reduce the immediate impact of the COVID-19 crisis. However, given the

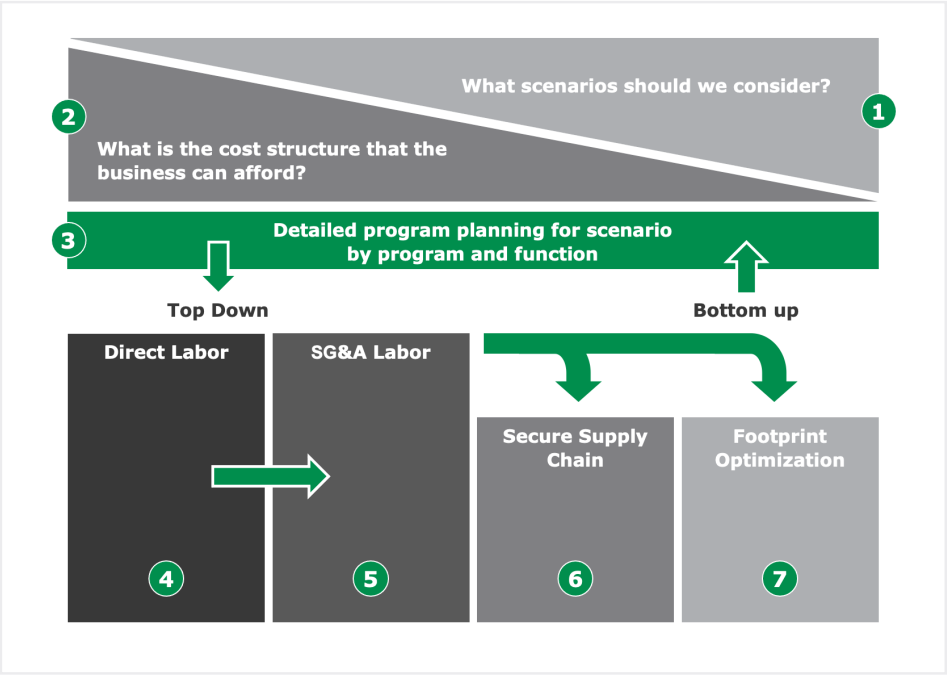

Figure 5:
Guiding structure of 'Fit for Ramp-Down' methodology

current outlook for the airline and commercial aerospace industry, short term measures will not be enough for the industry to survive sustainably. Access to debt refinancing with increased debt will become more difficult as economies move past COVID-19.

The measures taken by governments address short-term survival issues, to maintain immediate liquidity in corporations. Most of the volume centers on state guarantees for corporations to take on new debt or to refinance existing debts. In special cases states have also opted for equity investment, becoming a shareholder and supplying financial assistance through a capital increase. This kind of state aid poses the risk of delaying or even preventing necessary restructuring initiatives, leading to a preservation of the status quo [Konle-Seidls, 2020].

Holistic Approach for Ramp-Down Required

Sustained demand drops lead to the conclusion that a structural change in the aerospace industry is inevitable, affecting all parts of businesses. Industrial setup, workforce adjustment and footprint optimizations will all be on the table to ensure business continuity.

Re-assessment of the industrial setup and of make/buy strategies, including insourcing of production volumes, are short-term measures to increase workload and mitigate fixed-cost impact on product costs. In the medium-term, vertical integration and increased M&A activities will be considered to improve competitiveness.

In the light of demand drops of 40% or more during the crisis and pre-crisis overstaffing in many companies due to termination or rate reduction of aircraft programs (e.g. Airbus A380 and Boeing 737Max) and low automation, workforce adjustments are likely to become necessary in many cases to ensure competitiveness. Short-term governmental measures, e.g. extended short time working, that currently support excess workforce are unlikely to last until demand in the aerospace industry recovers. Company resizing, including adapting direct and indirect processes and workforce (e.g. by implementing transfer or qualification companies), requires preparation time. Government aid programs cannot replace management decisions on how to shape the future of the company after the crisis, but instead allow some time to develop a holistic "Fit for Ramp-Down" program, enabling structured, company-wide adaptation of resources in a highly dynamic business environment.

Additionally, suppliers need to devise a footprint strategy to improve the overall cost base over the medium-term by transferring work to best-cost countries.

The measures described can be aggregated in a holistic approach to help companies: in the short term, by preparing for lower and more flexible demand, and in the medium term by consolidating their supply chains and optimizing their footprint by applying 7 structured and interconnected elements (Figure 5).

1. Scenario planning drives decision-making

Early assessment of the impact of the crisis on business top line is critical to safeguarding business and supply chain and preserving cash. A "Fit for Ramp-Down" approach begins with developing realistic Top-Down business scenarios at the executive leadership level, which is then followed by cascading financial targets down to all business levels.

A scenario planning war room should be established for each program, to understand the new business environment and to assess the impact on own business and the supply chain. This will help in developing likely scenario assumptions and rough order of magnitude (ROM) targets. Decisions will need to be taken, firstly on how to refocus the company on streamlined production and then on how to resize the industrial environment and its support organization to the "new reality".

2. Determine new cost structure and reduction levers

As next step, the cost structure of each program needs to be assessed to have a detailed view on cost and to derive the reduction potential. Building on this, cost reduction levers for labor, material, and industrial footprint can be identified. Bottom-up reduction levers identified in the program cost analysis need to be reconciled to the top-down targets established in the enterprise planning scenarios.

3. Detailed program planning for scenario by program and function

Multiple scenarios should be developed, but only one scenario should be selected to enable the business to start planning implementation of levers. Given the current dynamic industrial environment, a company needs to be prepared to modify the chosen scenario frequently. New information is likely to arise relating to changed circumstances compared to any initially forecast plan.

4. Match direct labor with the new workload and shop floor setup

The main objective of this step is to offload excess direct labor and increase workforce flexibility. Factory workers and corporate employees who focus on production-related activities should match the new workload and shop floor setup. This will achieve lower recurring costs, proportionate to the required production rate decrease.

On the other hand, preserving competencies is essential to ensuring readiness once production programs start to ramp up again. Human resources (HR) team support is critical in retaining mandatory competencies and expertise, and in training staff for new competencies. HR is also the instrumental element in setting up redeployment platforms and organizing and structuring all personnel moves and transfers.

5. Reduce fixed cost base of selling, general, and administrative (SG&A) labor

Expenses related to workforce in central functions such as SG&A or engineering are fixed costs; these also need to be challenged and resized. Companies need to estimate the rough number of people required for each activity. Additional steps include revisiting central versus local allocation, consolidating teams, and applying span and layer rules for a leaner structure.

Strong governance and discipline are needed to maintain clear focus in improvement projects and limit product modifications (e.g. to essential improvements in safety, airworthiness and obsolescence). This is critical to resizing the engineering setup with exceptions to allow product development of highest value projects, safeguarding the future.

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6. Secure and consolidate supply chain

In the medium term, the supply base will need to be reshaped and consolidated. This will take time to implement but must be initiated as part of the resizing plan. Reducing production rates is an opportunity to reshape the supply chain and manage transfer of work with minimal disruption. This may include site divestiture, consolidations, or closures. Such a plan enables consolidation and reshaping of the target Tier 1 and Tier 2 supplier landscape. To secure the supply chain, a 'watch tower' is established to communicate rate changes, identify supplier risks for performance and viability, and plan for transfer of work.

7. Footprint optimization

Footprint optimization is usually the last reduction lever to be pulled, due to the lead-time and the competing priority to stabilize existing operations. This lever can be implemented in combination with supply chain optimization. AlixPartners applies a tailored value-chain perspective footprint modelling approach to help companies frame their future operations. To optimize manufacturing and distribution cost, it is crucial to consider current and legacy products, processes in different plants, and inter-company flows. Besides the manufacturing facilities, office space needs to be analyzed, as it represents a huge opportunity to reduce fixed costs in a post-COVID world where working remotely has proven effective.

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Zusammenfassung

Nach jahrzehntelangem, stetigem Wachstum ist die Aerospace-Industrie durch die COVID-19 Pandemie schlagartig in eine schwere Krise gestürzt. Aufgrund sinkender Passagierzahlen sind Airlines in ihrer Existenz bedroht und verschieben oder stornieren Flugzeugbestellungen. Entsprechend verringerte Produktionsraten werden von den Herstellern auf die gesamte Wertschöpfungskette kaskadiert. Alle Akteure in der Industrie sind gefordert, ihre Produktionsabläufe anzupassen, um unnötiges Cash-out zu vermeiden und die Existenz der Unternehmen zu schützen. Kurzarbeit und andere staatliche Programme überbrücken lediglich die unmittelbaren Auswirkungen der COVID-Krise, sollten aber nicht mit langfristigen Lösungen verwechselt werden. Eine vollständige Erholung der Nachfrage in der Luft- und Raumfahrtindustrie wird wahrscheinlich erst nach dem Auslaufen der Regierungsprogramme eintreten. Die Aerospace-Industrie sollte sich auf einen länger anhaltenden Nachfragerückgang einstellen und ihre Kapazitäten strukturiert an die „neue Normalität" anpassen. Proaktive nachhaltige und strukturelle Anpassungen der Unternehmen, insbesondere das Flexibilisieren der Kostenbasis können einen Vorteil für den Ramp-up nach der Krise bringen.

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