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# Coronavirus & 737 MAX

## *Observations for Leadership*

February 2020

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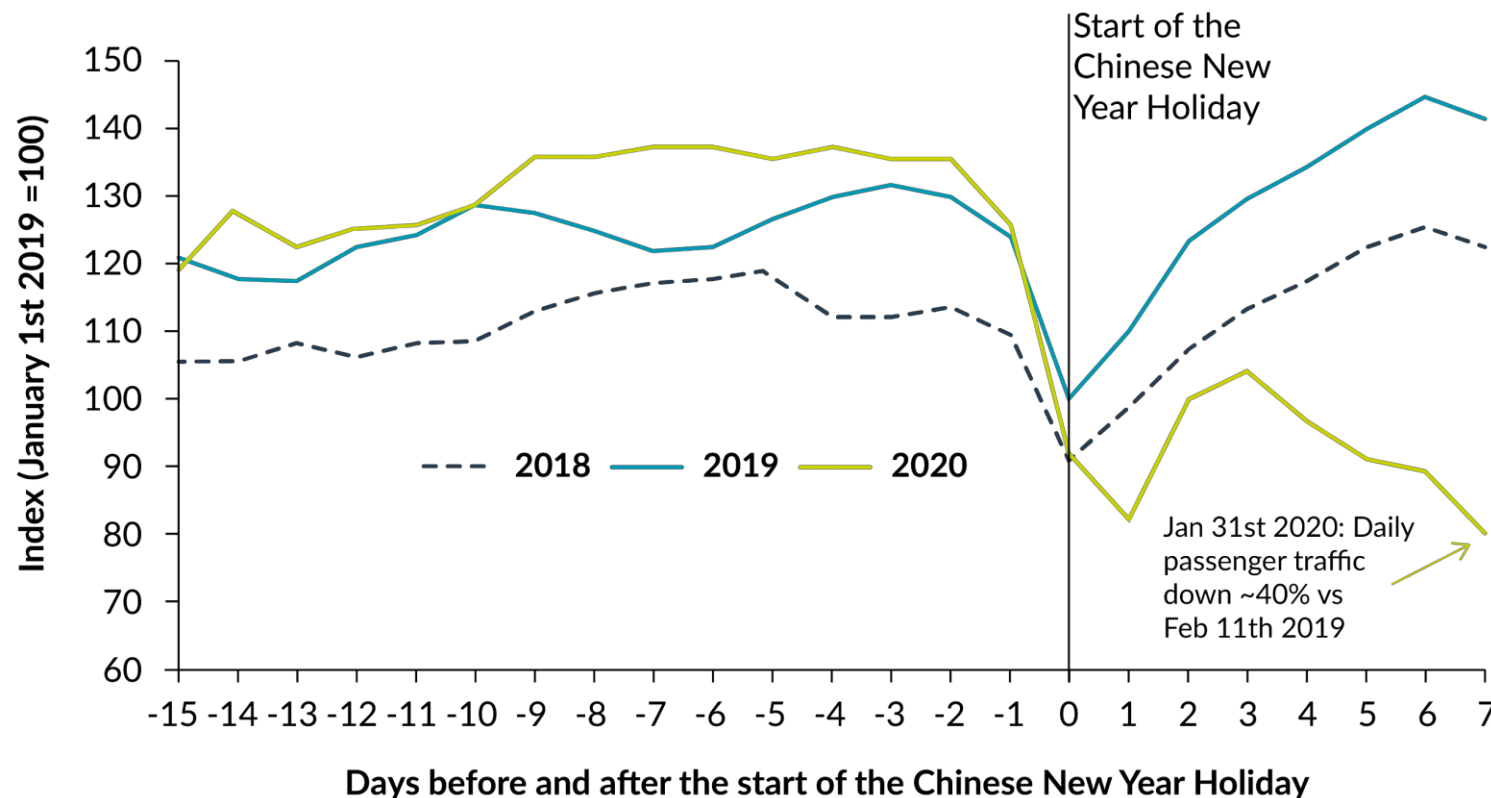


There are two key  
issues to address

#1  
CORONAVIRUS

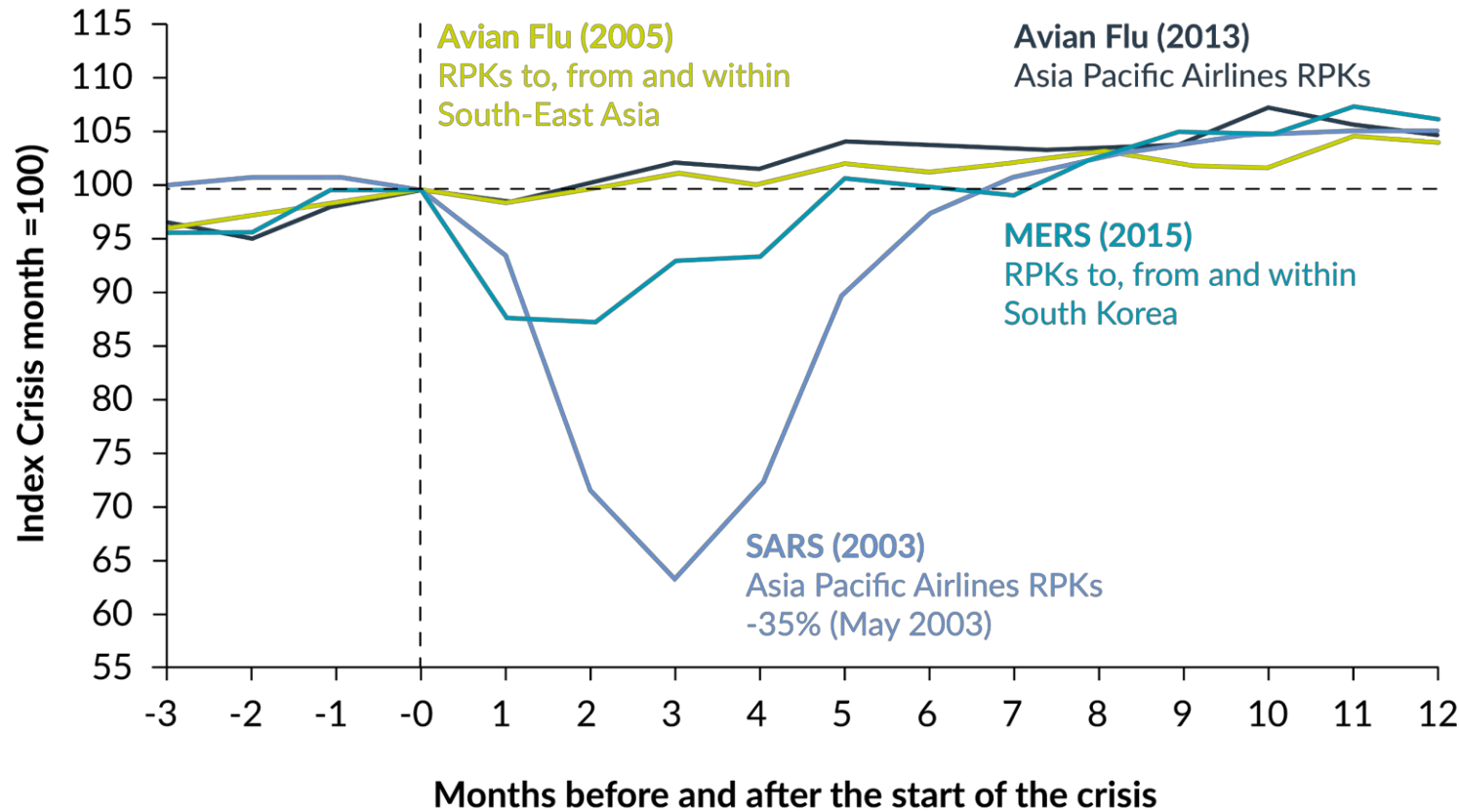
#2  
737 MAX

## Coronavirus is impacting passenger traffic – particularly Chinese travel



- ▲ Passenger volumes declined sharply following the closure of Wuhan Airport and the World Health Organization's declaration of the coronavirus as an international public health emergency
- ▲ For instance, IATA data shows that on Jan 31st, daily passenger volumes were c. 40% lower compared to where we would expect them to be at a similar stage (i.e., the week after the start of the holiday)
- ▲ China is the second-largest domestic market in terms of RPKs (after the USA). Hence, the continuation of this downward trend and its potential spillover to the region implies a sharp slowdown in Asia-Pacific RPKs in the short-term
- ▲ Previous analysis indicates the typical recovery period is around six months

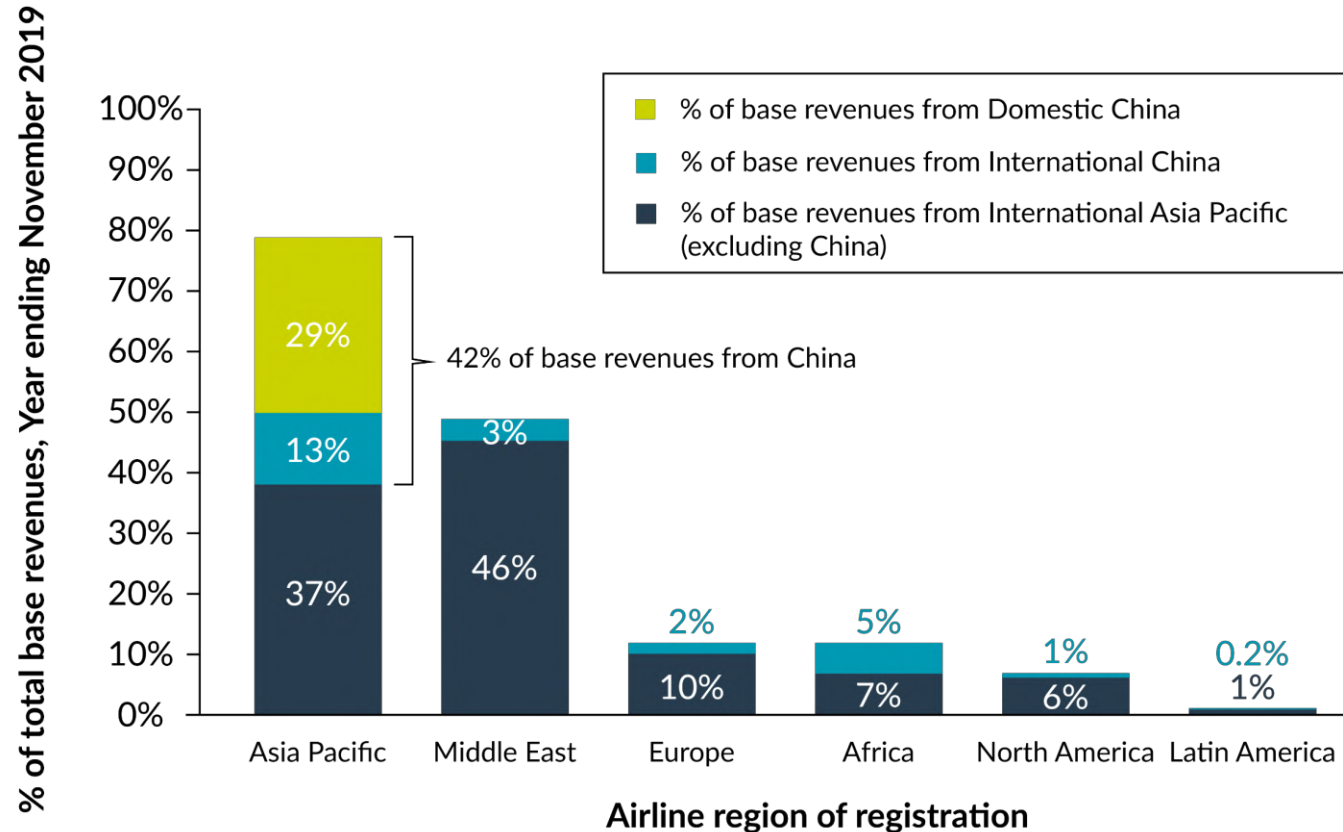
The airline industry has proven resilient to shocks. Even with the outbreak of SARS, monthly international passenger traffic returned to its pre-crisis level within nine months



- ▲ SARS (2003) has been the most serious epidemic impacting traffic in recent years. It resulted in Asia-Pacific airlines losing 8% of annual RPKs and \$6B revenues
- ▲ The 2005 and 2013 episodes of avian flu had a much milder and short-lived impact, and air travel rebounded quickly
- ▲ MERS Flu (2015) was focused on South Korea. The initial impact was a sharp slowdown, i.e. a 12% decline in monthly RPKs to, from and within South Korea in the first month of the outbreak. Air travel volumes began to recover after two months and returned to pre-outbreak levels within six months
- ▲ However, the strong growth of the Chinese air transport market means an additional 450 million passengers fly to from and within China per year compared with a decade ago
- ▲ The timing of this outbreak also coincided with New Year celebrations, China's busiest travel season
- ▲ While there are risks that this outbreak could cause a sizeable disruption, history indicates that any effect on air transport would be temporary



# Unsurprisingly, Asia Pacific airlines are most at risk of impact from Coronavirus



- Asia Pacific airlines generate approximately 42% of their revenue from flights to and from and within China - consequently, these airlines will be most susceptible to reduced travel demand
- Domestic China is now the world's second-largest domestic travel market (after the Domestic USA)
- For airlines, in other regions, the importance of China is much less with only 1-5% of revenues coming from flights to and from China
- The hope is that the virus doesn't expand to other regions in a big way since the impact on airlines that connect global transfer traffic (e.g., Middle Eastern hub carriers) would be much greater
- Cathay Pacific (based in Hong Kong) has canceled two in every five flights for February and March. Singapore Airlines is canceling 674 flights between March and May because of Coronavirus
- Asia Pacific airline profitability will be impacted the longer the outbreak continues

Source: IATA Economics using DDS. Base revenues: excluding revenues from ancillaries, baggage fees, etc

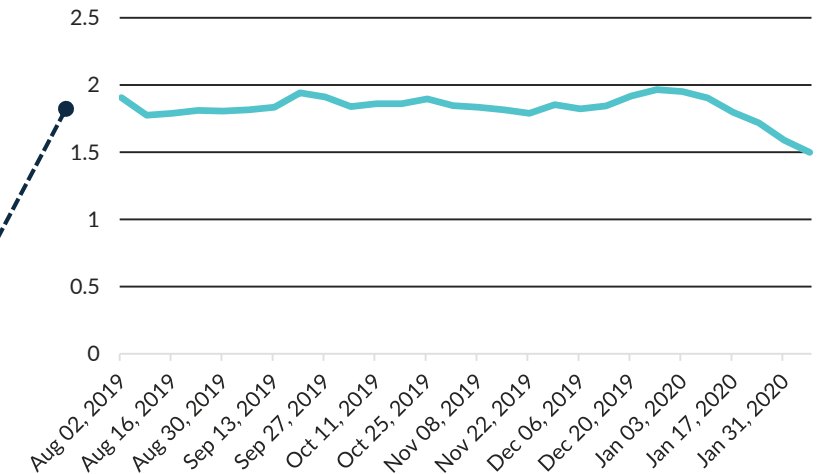
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# There's a bright spot: Jet fuel is currently 30% lower than it was at the end of 2019

U.S. Gulf Coast Kerosene-Type Jet Fuel Spot Price FOB (\$/Gallon)



U.S. Gulf Coast Kerosene-Type Jet Fuel Spot Price FOB (\$/Gallon)  
August 2019-February 2020

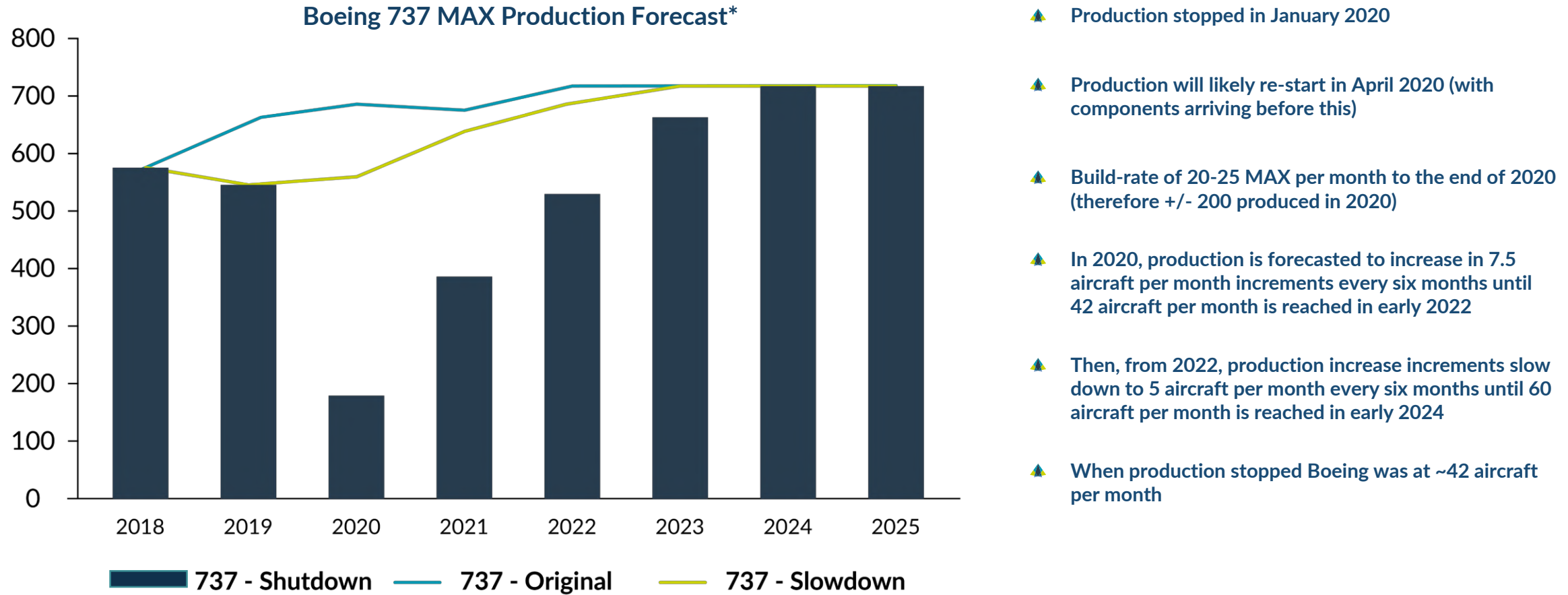


- ▲ Jet fuel is currently ~\$67.5 per barrel\*
- ▲ Average for 2019 was \$79.7 / bbl.
- ▲ Fuel is currently ~30% lower than at the end of December
- ▲ Fuel is typically #1 airline cost

Source: EIA, \* As of end of 14<sup>th</sup> February 2020

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## It will likely take two years until MAX achieves previous production rates



Source: Charles Edwards \* Production and not deliveries

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## Boeing's new CEO, David Calhoun

*"... things have changed ... the competitive playing field is a little different"*

*"We're going to start with a clean sheet of paper again"*

Has asked the Boeing team to do an assessment of the future market and what kind of airplane is needed to meet the future market

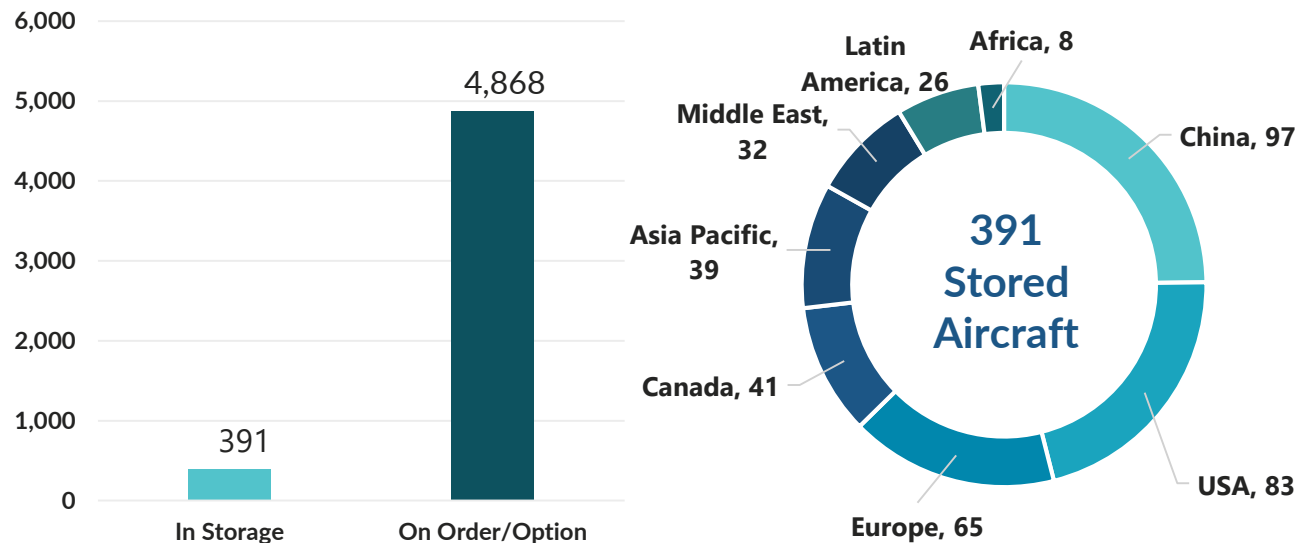
*"The MAX will resume its previous place in the market and remain in service for a generation"*





## Although there have been few MAX order cancelations, future price discounting will likely put even more pressure on suppliers

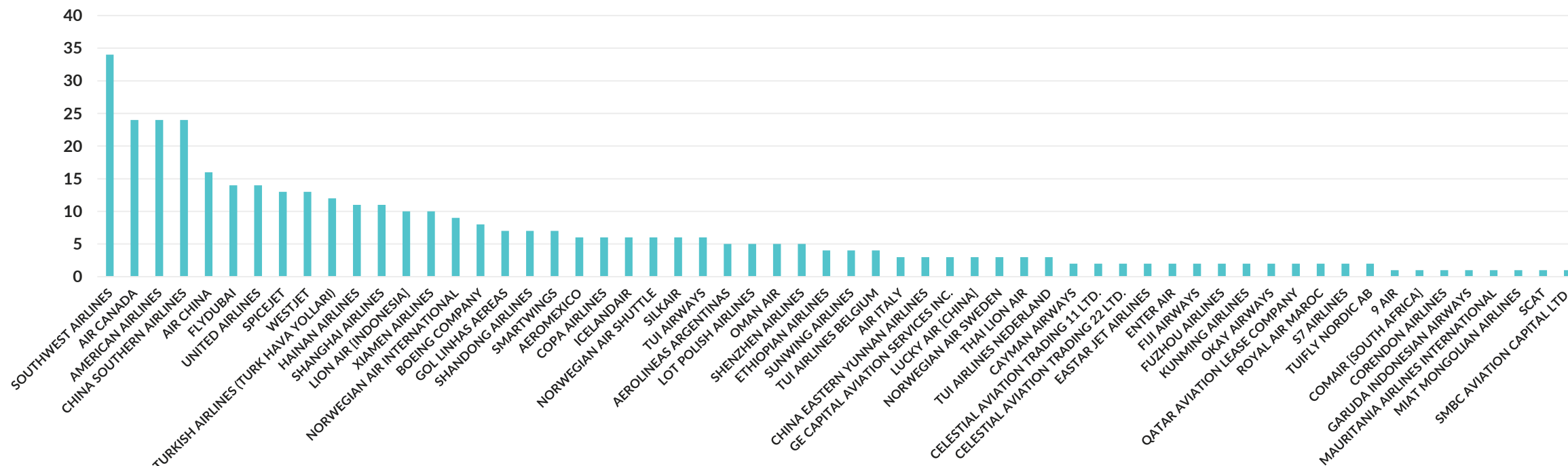
### 737 Max Fleet Status (February 2020) Qty of Aircraft



- ▲ The 737 MAX was launched in 2011, entered service in 2017
- ▲ 737 MAX was grounded in March of 2019 and will likely return to service in the “middle” of 2020
- ▲ ~391 aircraft are stored; backlog of 4,868 aircraft
- ▲ Boeing shut down the MAX production though it will resume in a few months. As a result, Spirit Aerosystems announced 2,800 layoffs (50% of their revenue comes from the 737)
- ▲ Boeing has been compensating customers for MAX delays. American Airlines, for instance, allocated \$30M from compensation to its 2019 employee profit-sharing program
- ▲ Boeing is likely having to discount more deeply to maintain share meaning further cost pressures on suppliers
- ▲ The company is “rethinking” the New Mid-market Aircraft (NMA) and needs to counter the success of the A321neo and A321XLR
- ▲ Changes to FAA’s oversight of Boeing will likely lead to increased supplier oversight
- ▲ Return to service of the parked aircraft will likely to be phased, and, will depend upon readiness of airlines to accept them and of course regional regulatory approval

There are 25 airlines with more than six MAX aircraft parked; 11 Airlines represent over 50% of the parked fleet

Boeing 737 MAX Stored Fleet by Operator (February 2020)



# Boeing has six key 737 MAX return to service objectives

## REMEMBERING LIVES LOST

### Lion Air Flight 610

Indonesia | October 29, 2018 | 6:20 a.m.

### Ethiopian Airlines Flight 302

Ethiopia | March 10, 2019 | 8:41 a.m.

## ESTABLISHED FUND FOR VICTIMS' FAMILIES AND COMMUNITY SUPPORT



### SOFTWARE UPDATES

- Robust MCAS software update **THREE ADDITIONAL LAYERS** of protection
- **800+ TEST** and **PRODUCTION FLIGHTS** with new software totaling **1,500+ HOURS**
- Additional updates to the flight control computer software for **FURTHER REDUNDANCY AND SAFETY**



### TRAINING UPDATES

- Developing **COMPREHENSIVE** proposed **TRAINING** with global regulators
- **ONGOING FEEDBACK** from pilots around the globe
- **NEARLY 90%** of MAX operators participated in simulator session with software update



### FLEET SUPPORT

- **24/7 OPERATIONS CENTER**
- Deliver **HIGHEST QUALITY** on-the-ground **SUPPORT** for fleet readiness
- **ENTRY-INTO-SERVICE APPROACH** to support MAX return to service augmented with advanced analytics



### GLOBAL OUTREACH

- **CONTINUED LISTENING** and **FEEDBACK** from customers and regulators
- **20 GLOBAL CONFERENCES** for operators & financiers with **1100+ PARTICIPANTS** from **250+ ORGANIZATIONS**
- **545 PARTICIPANTS** in **SIMULATOR SESSIONS** from 140 customers, regulators and other stakeholders



### AIRPLANE PRODUCTION

- Actions to **DRIVE QUALITY AND STABILITY** across production system
- **CLOSELY ENGAGING WITH** more than **900 737 SUPPLIERS** and efforts for **SUPPLY CHAIN STABILITY**
- **MEASURED DECISIONS** on production rate to plan for future



### COMPANY ACTIONS

- **STRENGTHENING** the culture of **SAFETY** at Boeing and industry-wide
- Separated Chairman and CEO roles for increased **FOCUS ON SAFETY** and **RTS**
- **REINFORCED CORE VALUES** of **SAFETY, QUALITY** and **INTEGRITY** in annual recommitment
- **ALL-EMPLOYEE QUALITY** stand-down and training



Other trends

# Additional Aerospace Trends Impacting Leadership



## OEMs are using several tactics to reduce cost and improve market position

Cost Reduction	Vertical Integration
<ul style="list-style-type: none"><li>• Scope+ (Airbus)</li><li>• Partnership for Success (Boeing)</li><li>• Year on year price reductions</li><li>• Sharing aftermarket profits is a condition of being sourced</li></ul>	<ul style="list-style-type: none"><li>• Wings</li><li>• Actuation</li><li>• Interiors</li><li>• Flight Control Computer</li><li>• Landing gear</li><li>• Aftermarket (e.g., KLX)</li></ul>
Increasing Supplier Competition	Other Tactics
<ul style="list-style-type: none"><li>• Dual sourcing</li><li>• Developing new suppliers and forming partnerships (e.g. Adient Aerospace, Boeing's seating joint-venture with Adient, and, Initium Aerospace, the Boeing/Safran joint-venture for APUs)</li></ul>	<ul style="list-style-type: none"><li>• Raw material aggregation</li><li>• Breaking LTAs or re-bidding parts even though an LTA is in effect</li><li>• No fly lists for suppliers that don't cooperate</li><li>• Redesigning parts to remove supplier IP</li><li>• Lengthening payment terms</li></ul>

## Merger & acquisitions continue to restructure the aerospace supply chain

Examples of Aerospace M&A Activity in 2018-2020



### Airbus A220



Bombardier exits the A220 program.  
Airbus acquires majority 75% stake with the remaining 25% held by Government of Quebec



Who is next ?



## There are also several key MRO trends to watch...



Big Data: Aircraft health monitoring & predictive maintenance



OE supply chain constraints & part shortages



How to differentiate MRO service offerings



OEM continued focus on the aftermarket



MRO capacity crunch



Retirement wave and USM / engine green time availability



In-service aircraft & engine issues



MRO expansion & insourcing



Labor shortages

# Introducing



**NAVEO**  
CONSULTANCY

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Naveo is a focused aerospace consultancy dedicated to serving the needs of global clients, large and small. Highly responsive and backed by timely, relevant thought leadership, and in-house intellectual property. We support revenue growth and business optimization across the production value chain – from raw materials to operators – and aircraft lifecycle – from entry-into-service to retirement and part-out. Our team is led by the aerospace consultant, Richard Brown.

Aerospace is fast-moving, so we understand how your in-house analytical, operational, and strategic resource is being challenged with constantly evolving issues. Naveo provides fresh, dynamic, and relevant advice to help you understand the critical issues that impact revenue growth, efficiency savings, and strategic options.



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Experience managing  
projects with global  
blue-chip clients



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leadership for the  
digital age



From manufacturing suppliers  
to operators, from production  
to aftermarket

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# NAVEO's consultancy expertise is broad. Our capabilities include:

## Strategy & Market Analysis

- ▲ Additive manufacturing and 3D printing
- ▲ Aerospace cluster strategy planning and support
- ▲ Aftermarket value proposition research, design and testing
- ▲ Airframe, component, engine and cabin interior market
- ▲ Big data and connectivity, aircraft health monitoring, prognostics and diagnostics
- ▲ Customer satisfaction research, implications and action plans
- ▲ Customer segmentation and buying behaviour
- ▲ Engine parts repair market Operations and supply chain improvements
- ▲ Original equipment production and MRO aftermarket forecasting
- ▲ PMA parts market
- ▲ Strategy planning
- ▲ Surplus parts / used serviceable material (USM)

## M&A transaction support services

- ▲ Market assessment and trends
- ▲ Demand and supply outlook
- ▲ Competitive positioning, strengths and weaknesses
- ▲ Independent revenue and margin commentary
- ▲ Expansion growth vectors
- ▲ Potential bolt-on acquisitions (or divestitures)
- ▲ Exit considerations





# Thank you!

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