

Global Aerospace

BofA Commercial Aerospace: Cycles improved across all regions except EU

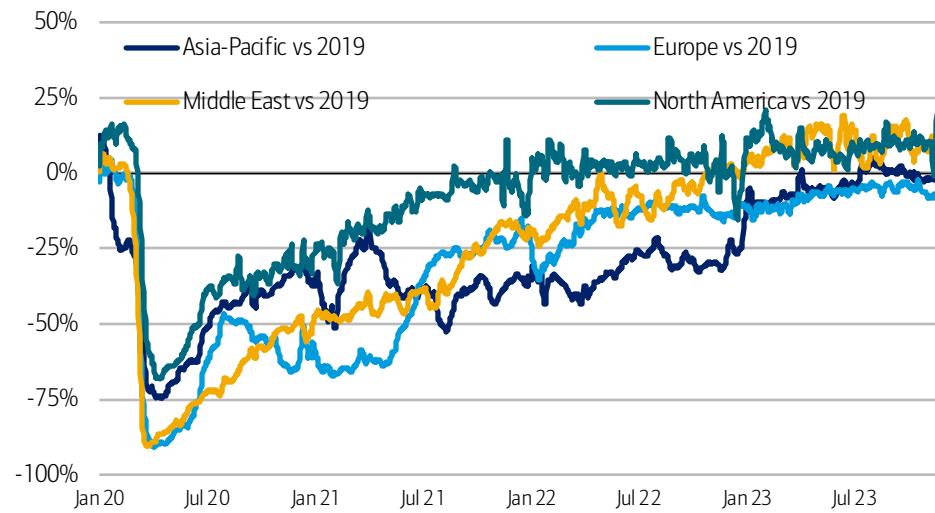
Industry Overview

All major engine families reported strong growth in 2023

Global commercial 7-day average cycles vs 2019 improved by 0.4ppts to -6.1% this week, vs -6.5% last week. On the positive side, North America 7-day average cycles improved by 3.3ppts to 4.4% this week, vs 1.1% last week, primarily driven by USA improving by 3.9ppts to 4.5% this week, vs 0.6% last week. On the same lines, Latam and Middle East 7-day average cycles vs 2019 improved by 3.3ppts and 2.2ppts to 9.6% and 8.5% vs 2019 levels vs 6.3% and 6.4% last week, respectively. APAC 7-day average cycles vs 2019 remained flat at 0% vs last week as China only improved by 0.1ppts WoW, while Africa slightly improved by 0.2ppts to 10.4%, vs 10.2% last week. On the negative side, Europe 7-day average cycles vs 2019 declined by 0.5ppts to -4.3% this week, vs -3.8% last week. Europe is the only region below 2019 levels in 2024 (c.-5%).

Exhibit 1: Global commercial flights daily tracked 7-day avg. vs 2019

North America was the region that improved the most this week, primarily driven by strong performance in the US



Source: BofA Global Research, Flightradar24

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Global dedicated freighters improved by 0.7% WoW

Global dedicated freighters 7-day average cycles vs 2019 improved by 0.7% WoW to 1.7% this week, vs 1.0% last week. Widebody dedicated freighters 7-day average cycles vs 2019 improved by 2.9ppts to 5.0%, vs 2.1% last week. On the flip side, Narrowbody dedicated freighters 7-day average cycles vs 2019 declined by 4.7ppts to -6.7% this week, vs -2.1 last week.

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avg: average

c.: circa

ppts: percentage points

vs: versus

WoW: Week over Week

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Refer to important disclosures on page 85 to 86.

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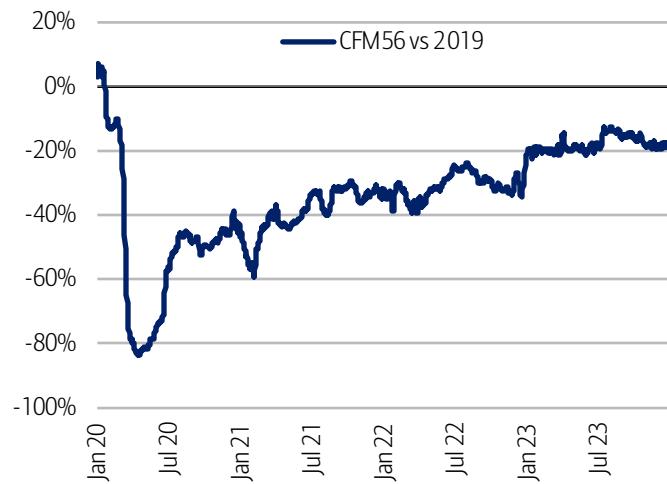
Engine cycles tracker

Engine cycles historically have tended to be better indicators for engine aftermarket trends than flight hours, as take-offs and landings are where most stress is placed on engine components.

- CFM56 family** 7-day rolling avg. daily flights declined to 12.3% YoY and improved to -18.1% vs 2019 this week, a -10.4 pts fall and 0.2 ppts improvement vs 22.8% and -18.3% respectively last week

Exhibit 2: CFM56 family 7-day avg. daily flights tracked YoY %

The CFM56 family made gradual progress through FY23

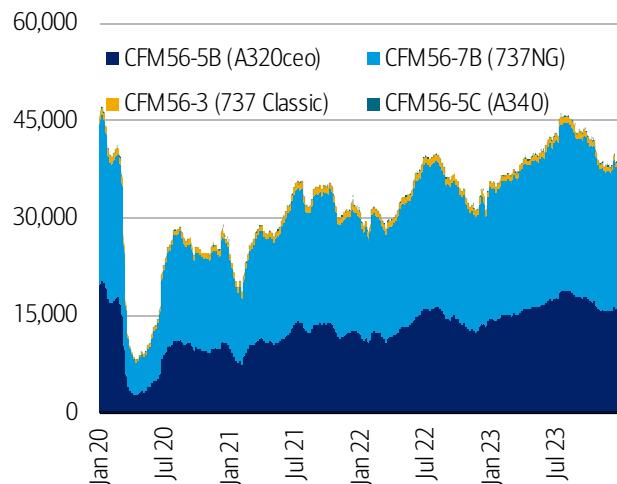


Source: BofA Global Research, Flightradar24

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Exhibit 3: CFM56 family 7-day avg. daily flights total

5B and 7B have the largest share of fleet on Boeing/Airbus narrowbody



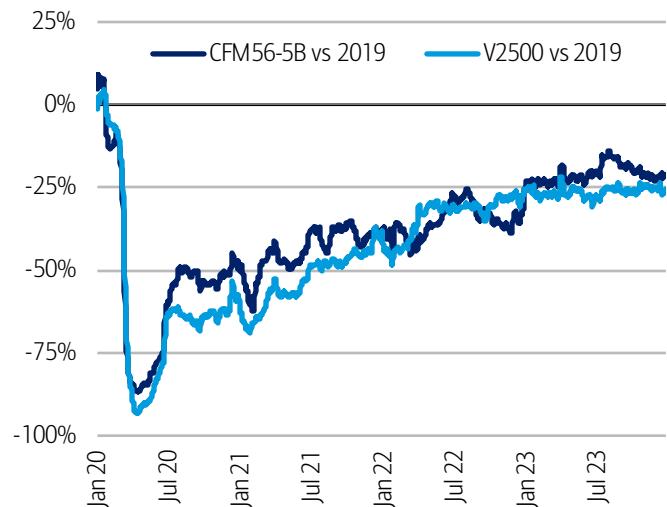
Source: BofA Global Research, Flightradar24

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- CFM56-5B (A320ceo)** 7-day rolling avg. daily flights declined to 14.6% YoY and declined to -21.8% vs 2019 this week, a -4.9 pts fall and -0.5 ppts fall vs 19.5% and -21.3%, respectively, last week. This compares to **V2500 (A320ceo)**, which declined to 1.2% YoY and improved to -26.5% vs 2019 this week, a -3.3 pts fall and 0.1 ppts improvement vs 4.5% and -26.5%, respectively, last week.

Exhibit 4: CFM56-5B (A320ceo) vs V2500(A320ceo) 7-day avg.

YoY
CFM56-5B and the V2500 are now broadly in line

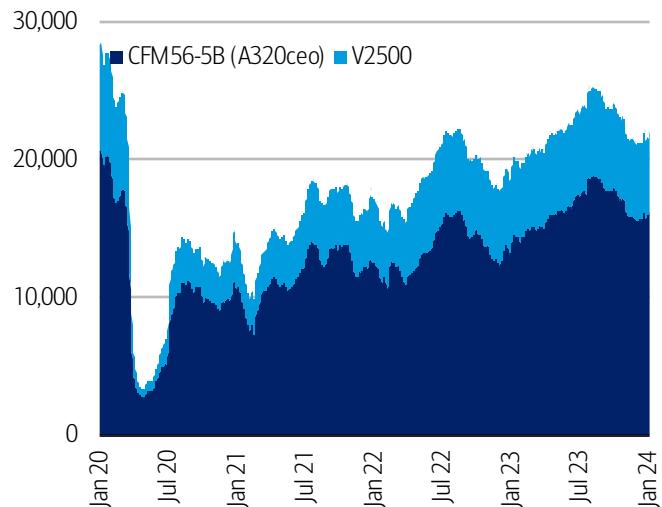


Source: BofA Global Research, Flightradar24

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Exhibit 5: CFM56-5B (A320ceo) vs V2500(A320ceo) 7-day avg. daily flights total

CFM56 has higher market share vs V2500 on the A320ceo



Source: BofA Global Research, Flightradar24

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- CFM56-7B (737 NG)** 7-day rolling avg. daily flights declined to 12% YoY and improved to -14.7% vs 2019 this week, a -15.6 pts fall and 0.8 pts improvement vs 27.6% and -15.5%, respectively, last week.

Exhibit 6: CFM56-7B (737NG) 7-day avg. daily flights tracked YoY %
CFM56-7B shown gradual improvement through 2023

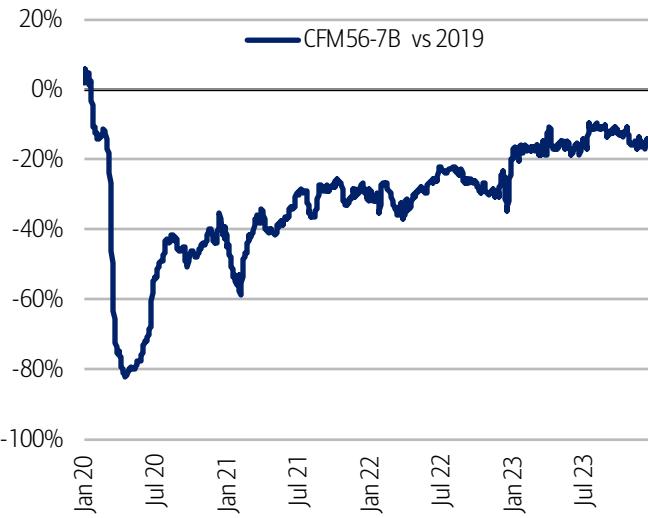
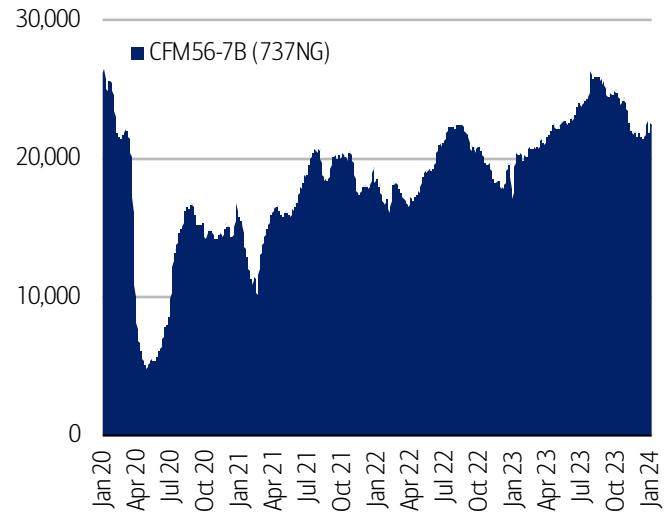


Exhibit 7: CFM56-7B (737NG) 7-day avg. daily flights total
CFM56-7B cycles are almost back at pre-COVID levels



- CFM LEAP-1A (A320neo)** 7-day rolling avg. daily flights declined to 25.6% YoY and declined to 71.2% vs 2019 this week, a -2.7 pts fall and -4.7 pts fall vs 28.3% and 75.9%, respectively, last week. This compares to **PW1100G (A320neo)**, which declined to -3.2% YoY and declined to 76.5% vs 2019 this week, a -5.7 pts fall and -7 pts fall vs 2.6% and 83.5%, respectively, last week.

Exhibit 8: CFM LEAP-1A (A320neo) vs PW1100G 'GTF' (A320neo) 7-day avg. daily flights tracked YoY %

PW1100G 'GTF' cycles have been higher than LEAP 1-A on A320neo

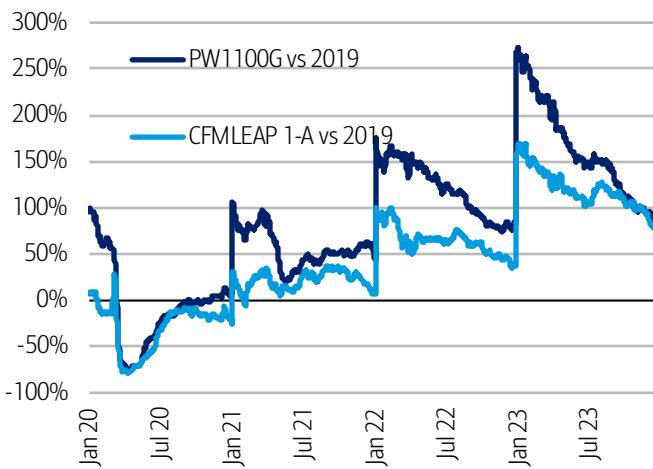
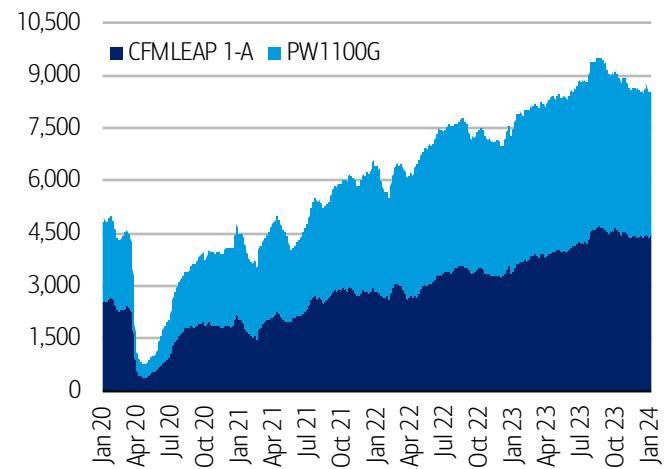


Exhibit 9: CFM LEAP-1A(A320neo) vs PW1100G 'GTF' (A320neo) 7-day avg. daily flights total

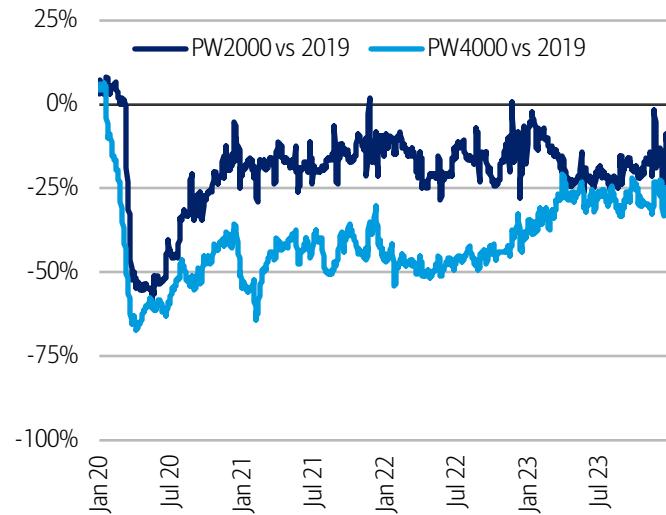
LEAP1-A fleet is slightly smaller than the GTF



- PW2000 (757)** 7-day rolling avg. daily flights declined to -3.2% YoY and improved to -11.6% vs 2019 this week, a -2.1 pts fall and 0.9 pts improvement vs -1.2% and -12.5%, respectively, last week. This compares to **PW4000 (A300, A330, 747, 767, 777, MD-11)**, which declined to 18.4% YoY and declined to -27.8% vs 2019 this week, a -3.6 pts fall and -0.7 pts fall vs 21.9% and -27%, respectively, last week.

Exhibit 10: PW2000 (757) vs PW4000 (A300, A330, 747, 767, 777, MD-11) 7-day avg. daily flights tracked YoY %

PW2000 has large freight/military exposure, driving resilience

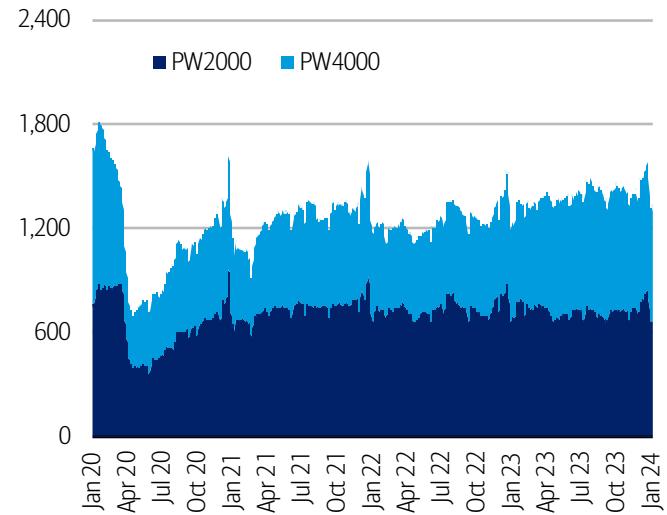


Source: BofA Global Research, Flightradar24

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Exhibit 11: PW2000 (757) vs PW4000 (A300, A330, 747, 767, 777, MD-11) 7-day avg. daily flights total

Pre-COVID, PW2000 cycles were c.800 per day vs c.600 in November 2022



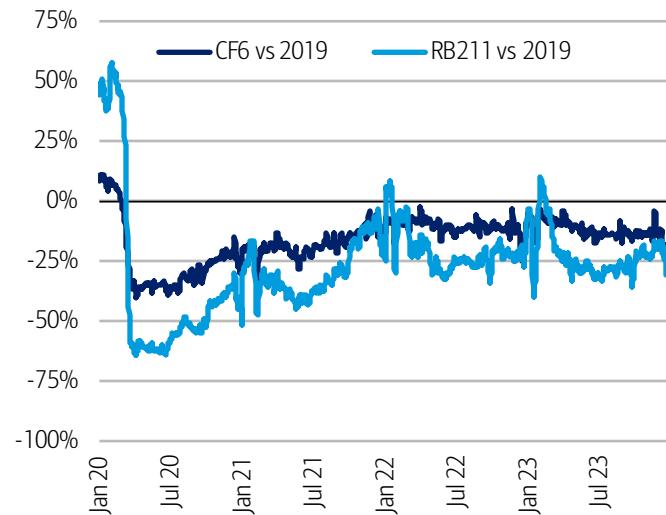
Source: BofA Global Research, Flightradar24

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- CF6 (A300, A310, A330, 747, 767)** 7-day rolling avg. daily flights declined to -5.5% YoY and declined to -20.8% vs 2019 this week, a -7.7 pts fall and -0.7 pts fall vs 2.2% and -20.1%, respectively, last week. This compares to **RB211 (747, 757, 767)**, which declined to -6.8% YoY and declined to -31.2% vs 2019 this week, a -8.1 pts fall and -12 pts fall vs 1.2% and -19.2%, respectively, last week.

Exhibit 12: CF6 (A300, A310, A330, 747, 767) vs RB211 (747, 757, 767) 7-day avg. daily flights tracked YoY %

CF6 and RB211 have shared freight exposure on 747 and 767

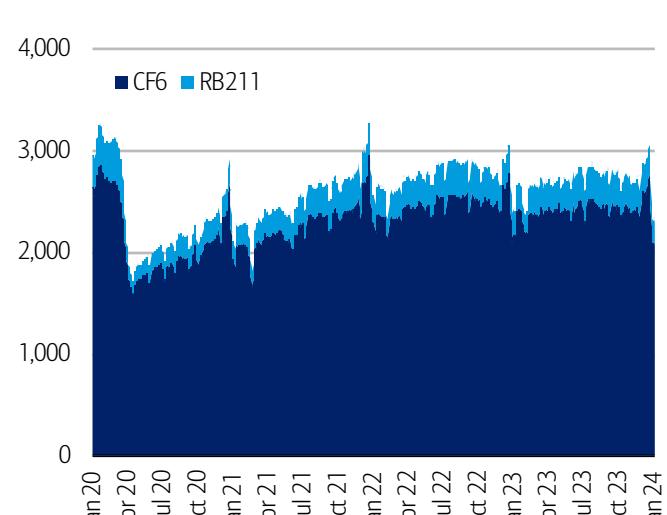


Source: BofA Global Research, Flightradar24

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Exhibit 13: CF6 (A300, A310, A330, 747, 767) vs RB211 (747, 757, 767) 7-day avg. daily flights total

CF6 has a substantially larger fleet than RB211



Source: BofA Global Research, Flightradar24

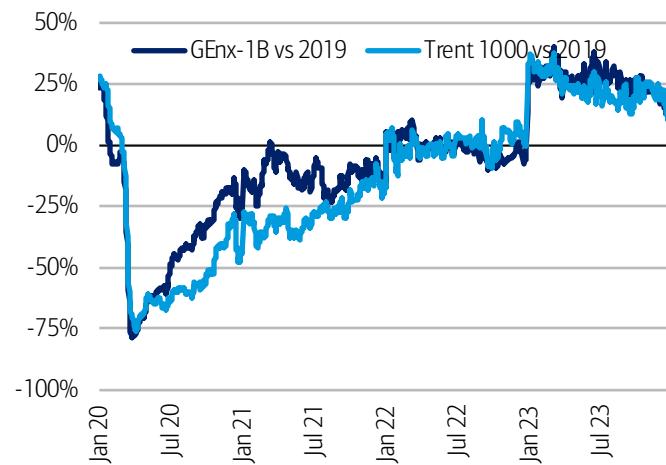
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- GENX (787)** 7-day rolling avg. daily flights declined to 22.6% YoY and improved to 20.3% vs 2019 this week, a 0 pts fall and 6 ppts improvement vs 22.6% and 14.4%, respectively, last week. This compares to **Trent 1000 (787)**, which improved to 11% YoY and improved to 14.4% vs 2019 this week, a 0.4 pts improvement and 2 ppts improvement vs 10.6% and 12.4%, respectively, last week.

Exhibit 14: GENX (787) vs Trent 1000 (787) 7-day avg.

Trent 1000 cycles had been weaker than GEnx-1B but are now in line

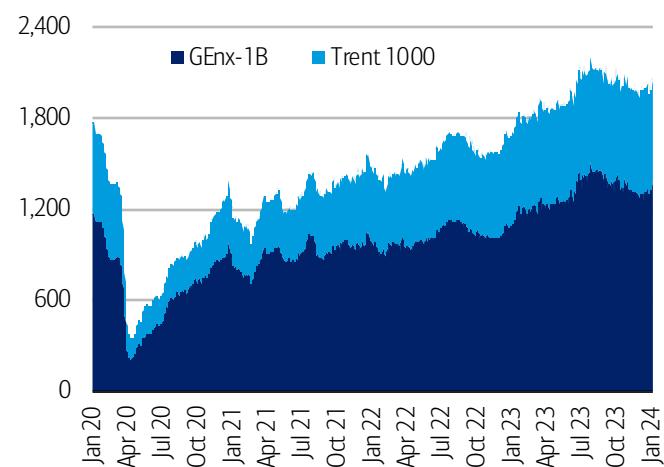


Source: BofA Global Research, Flightradar24

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Exhibit 15: GENX (787) vs Trent 1000 (787) 7-day avg. daily flights total

Trent 1000 has smaller exposure than GEnx-1B on 787



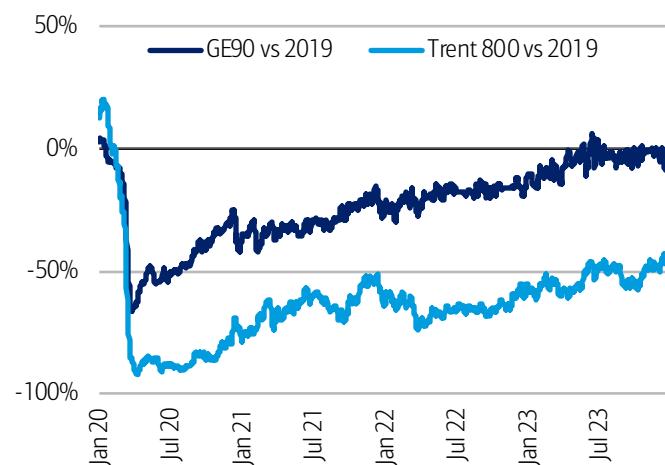
Source: BofA Global Research, Flightradar24

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- GE90 (777)** 7-day rolling avg. daily flights improved to 14% YoY and improved to -3.2% vs 2019 this week, a 0 pts improvement and 5.2 ppts improvement vs 14% and -8.3%, respectively, last week. This compares to **Trent 800 (777)**, which declined to 29.8% YoY and declined to -47.4% vs 2019 this week, a -5.4 pts fall and -1 ppts fall vs 35.2% and -46.4%, respectively, last week.

Exhibit 16: GE90 (777) vs Trent 800 (777) 7-day avg. daily flights tracked YoY %

GE90 historically competed with the Trent 800 and PW4000 on 777

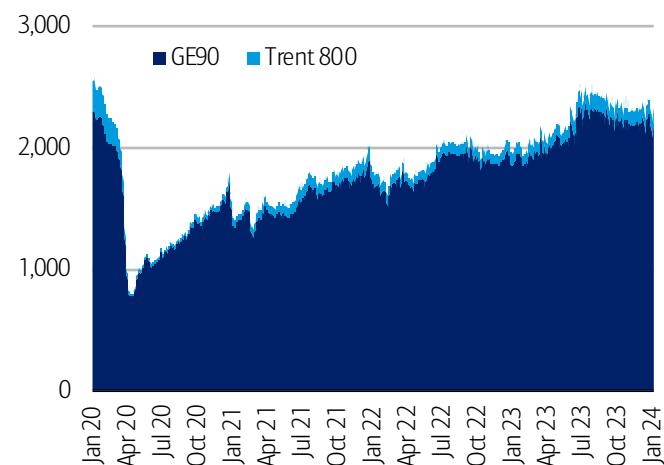


Source: BofA Global Research, Flightradar24

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Exhibit 17: GE90 (777) vs Trent 800 (777) 7-day avg. daily flights total

GE has sole position on later 777 variants (e.g., -300ER, -200LR)



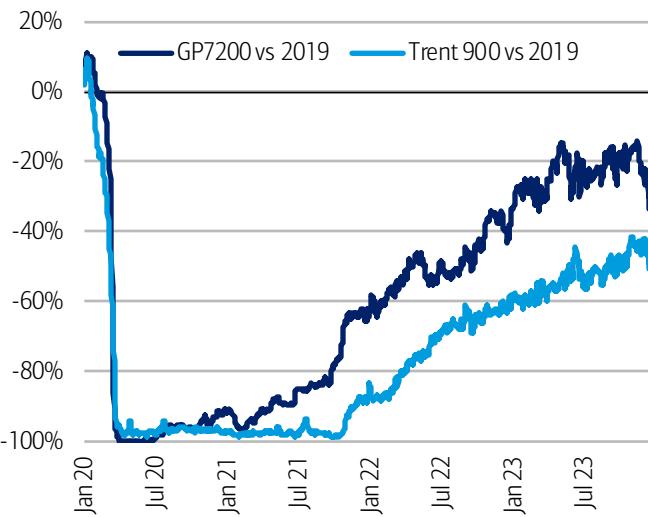
Source: BofA Global Research, Flightradar24

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- GP7200 (A380)** 7-day rolling avg. daily flights improved to 19.6% YoY and improved to -25.7% vs 2019 this week, a 1.6 pts improvement and 7 ppts improvement vs 18% and -32.7%, respectively, last week. This compares to **Trent 900 (A380)**, which improved to 38.5% YoY and improved to -42.6% vs 2019 this week, a 5.7 pts improvement and 7.6 ppts improvement vs 32.7% and -50.2%, respectively, last week.

Exhibit 18: GP7200 (A380) vs Trent 900 (A380) 7-day avg. daily flights tracked YoY %

The A380 has recovered strongly since 2022 but is still well below pre-COVID levels

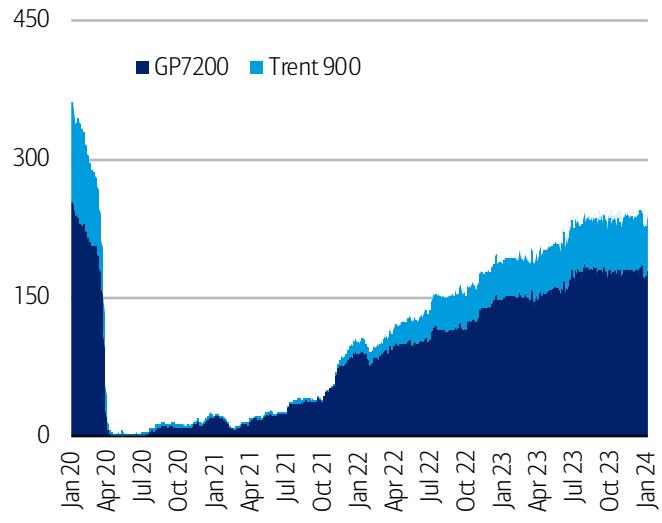


Source: BofA Global Research, Flightradar24

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Exhibit 19: GP7200 (A380) vs Trent 900 (A380) 7-day avg. daily flights total

GP7200 cycles have led Trent 900 during the limited recovery of A380



Source: BofA Global Research, Flightradar24

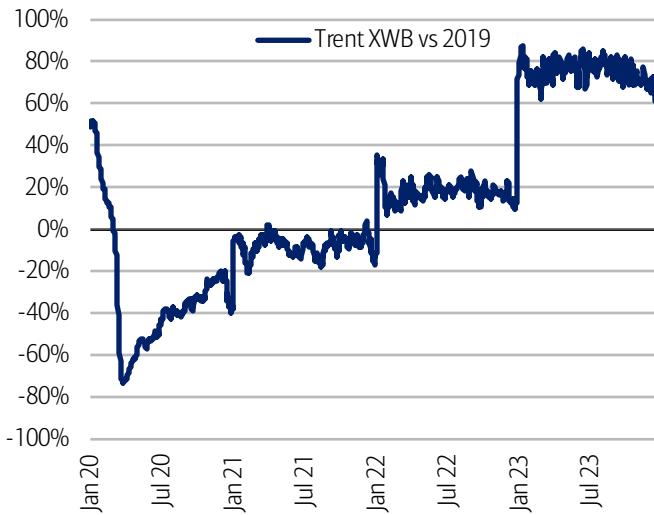
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- Trent XWB (A350)** 7-day rolling avg. daily flights declined to 44.6% YoY and improved to 64.9% vs 2019 this week, a -1.1 pts fall and 4.1 ppts improvement vs 45.7% and 60.8%, respectively, last week.



Exhibit 20: Trent XWB (A350) 7-day avg. daily flights YoY %

Trent XWB has strongly recovered driven in part by new deliveries

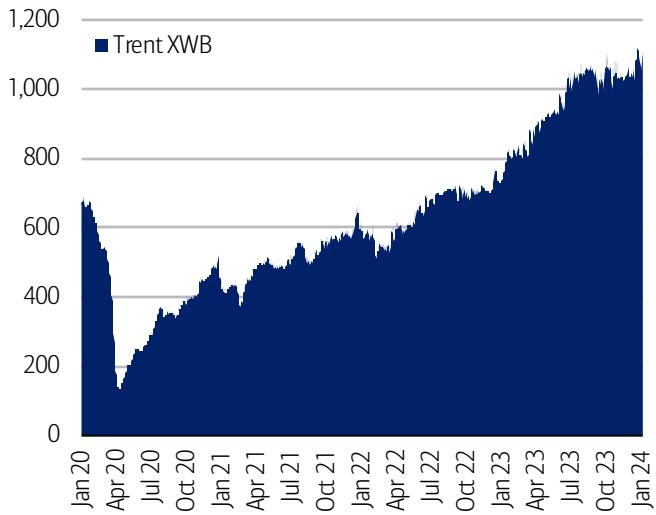


Source: BofA Global Research, Flightradar24

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Exhibit 21: Trent XWB (A350) 7-day avg. daily flights total

Pre COVID, Trent XWB daily cycles peaked at c.630



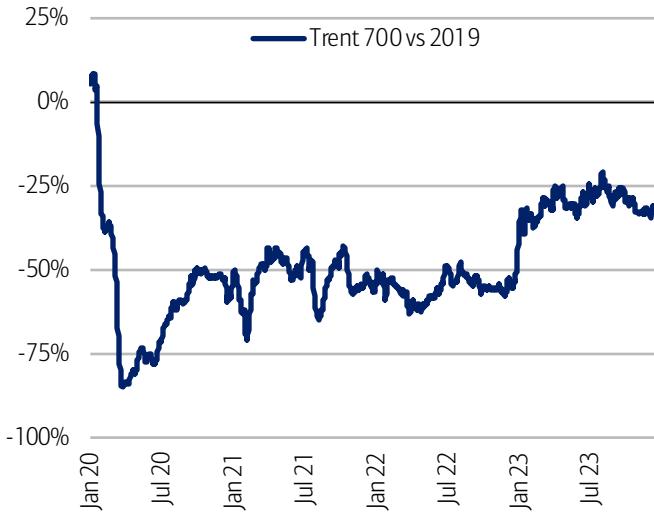
Source: BofA Global Research, Flightradar24

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- **Trent 700 (A330) 7-day rolling avg. daily flights** declined to 42.6% YoY and improved to -29.2% vs 2019 this week, a -6.3 pts fall and 3.5 ppts improvement vs 48.9% and -32.6%, respectively, last week.

Exhibit 22: Trent 700 (A330ceo) 7-day avg. daily flights tracked YoY %

Trent 700 is the market leader on A330ceo (c.65% of total fleet)

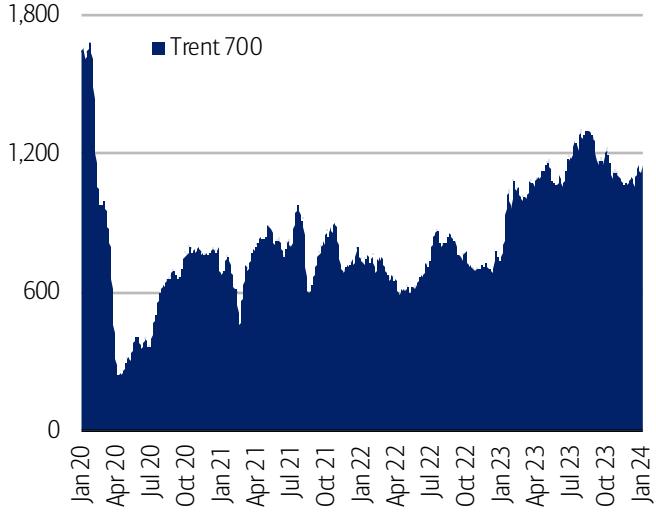


Source: BofA Global Research, Flightradar24

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Exhibit 23: Trent 700 (A330ceo) 7-day avg. daily flights total

Trent 700 daily cycles were c.1600 before COVID-19 pandemic



Source: BofA Global Research, Flightradar24

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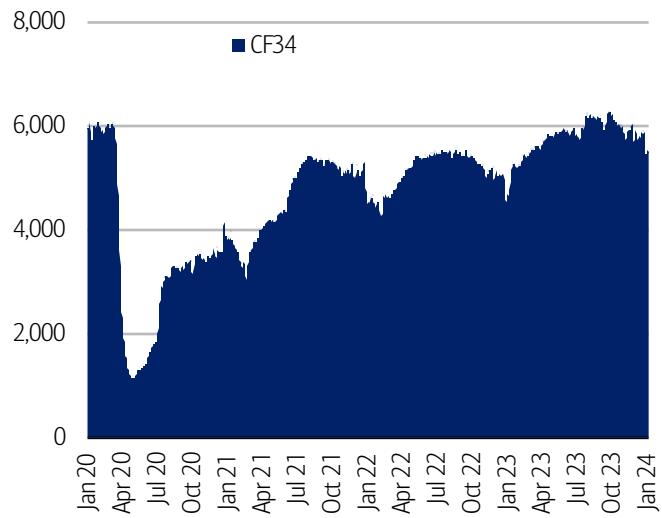
Exhibit 24: GE CF34 (E-Jet) 7-day avg. daily flights YoY %
The CF34 available on Embraer E-170 and E-190 family aircraft



Source: BofA Global Research, Flightradar24

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Exhibit 25: GE CF34 (E-Jet) 7-day avg. daily flights total
CF34 is back at pre-COVID levels



Source: BofA Global Research, Flightradar24

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Airbus: Airframe flight cycles

- Airbus A320neo** 7-day avg. daily flights were 20% YoY and 121.4% vs 2019, declining -4 ppts YoY and declining -6.4 ppts over 2019 vs 24% YoY and 127.9% over 2019 last week and comparing to a 2020 low of -76.5%.
- Airbus A320ceo** 7-day avg. daily flights were 12.2% YoY and -18.5 % vs 2019, declining -3.6 ppts YoY and improving 0.1 ppts over 2019 vs 15.9% YoY and -18.5% over 2019 last week and comparing to a 2020 low of -88.9%.

Exhibit 26: Airbus A320neo – 7-day avg. daily flights YoY %

A320neo fleet is much larger vs 2019 levels

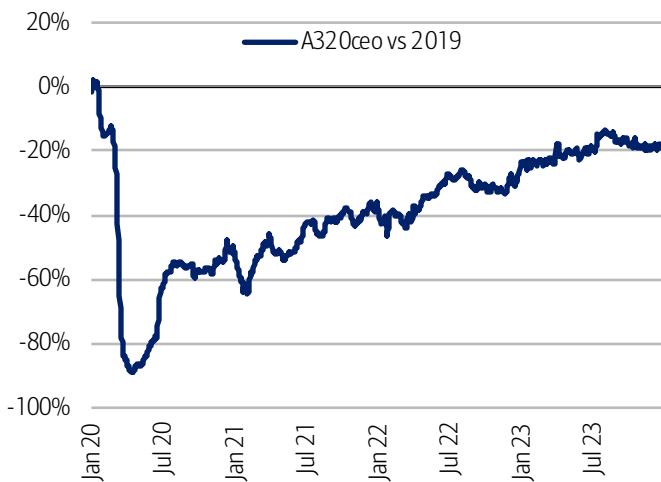


Source: BofA Global Research, Flightradar24

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Exhibit 27: Airbus A320ceo – 7-day avg. daily flights YoY %

A320ceo cycles have been gradually recovering



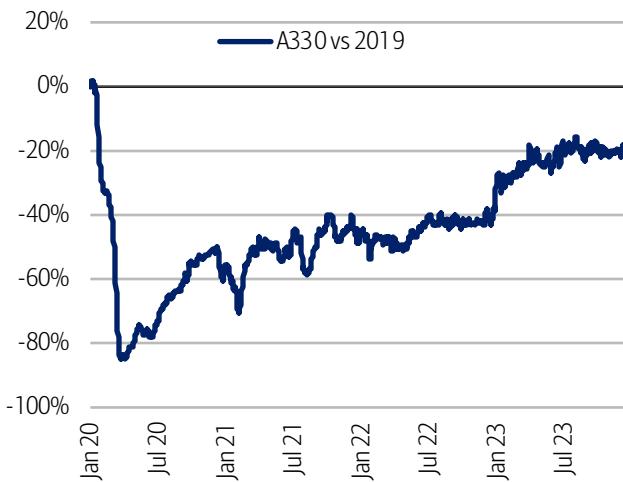
Source: BofA Global Research, Flightradar24

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- Airbus A330 family** 7-day avg. daily flights were 32.5% YoY and -17.4 % vs 2019, declining -3.9 ppts YoY and improving 3.8 ppts over 2019 vs 36.4% YoY and -21.1% over 2019 last week and comparing to a 2020 low of -84.9%.
- Airbus A340 family** 7-day avg. daily flights were 42.8% YoY and -36.2 % vs 2019, improving 4 ppts YoY and declining -3.6 ppts over 2019 vs 38.8% YoY and -32.6% over 2019 last week and comparing to a 2020 low of -89.5%.

Exhibit 28: Airbus A330 family – 7-day avg. daily flights YoY %

A330 family cycles have stabilized at c.-20% vs 2019 levels

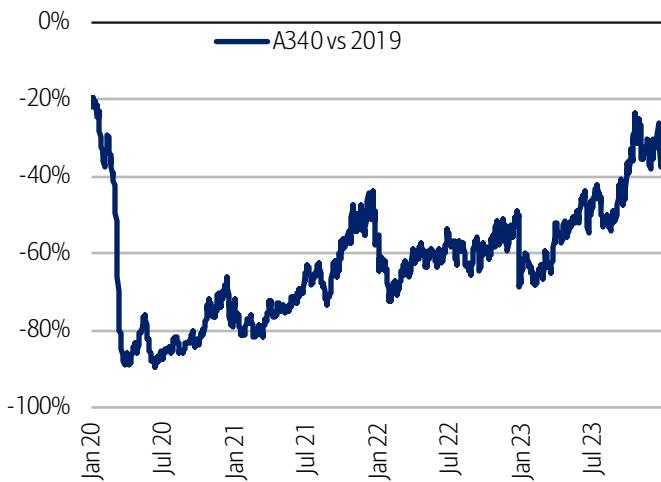


Source: BofA Global Research, Flightradar24

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Exhibit 29: Airbus A340 family – 7-day avg. daily flights YoY %

A340 has four engines – we expect platform to face high retirements



Source: BofA Global Research, Flightradar24

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- Airbus A350** - day avg. daily flights were 44.6% YoY and 64.9 % vs 2019, declining -1.1 ppts YoY and improving 4.1 ppts over 2019 vs 45.7% YoY and 60.8% over 2019 last week and comparing to a 2020 low of -73.2%.
- Airbus A380 family** 7-day avg. daily flights were 23.6% YoY and -30.7 % vs 2019, improving 2.5 ppts YoY and improving 7.2 ppts over 2019 vs 21.2% YoY and -37.9% over 2019 last week and comparing to a 2020 low of -99.4%.

Exhibit 30: Airbus A350 family – 7-day avg. daily flights YoY %

A350 is a ‘next gen’ widebody and has outperformed older platforms

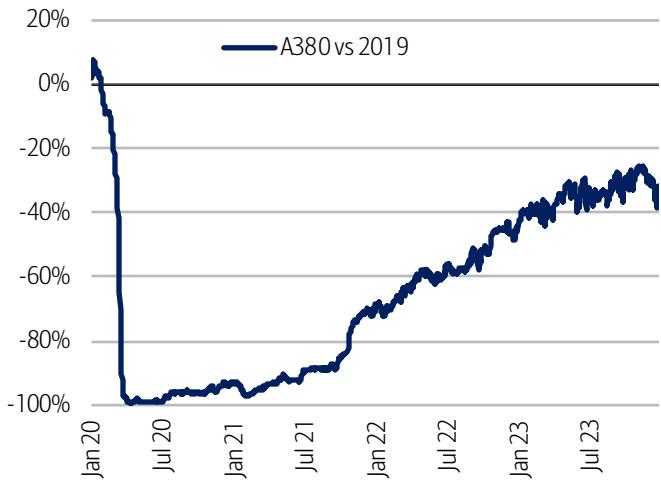


Source: BofA Global Research, Flightradar24

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Exhibit 31: Airbus A380 family – 7-day avg. daily flights YoY %

A380 is still very weak, but we see a progressive recovery trend



Source: BofA Global Research, Flightradar24

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Boeing: Airframe flight cycles

- Boeing 737 Original/Classic** 7-day avg. daily flights were -20.1% YoY and -31.8 % vs 2019, improving 1.7 ppts YoY and declining -1.6 ppts over 2019 vs -21.8% YoY and -30.2% over 2019 last week and comparing to a 2020 low of -64.4%.
- Boeing 737 NG** 7-day avg. daily flights were 12% YoY and -14.7 % vs 2019, declining -15.6 ppts YoY and improving 0.8 ppts over 2019 vs 27.6% YoY and -15.5% over 2019 last week and comparing to a 2020 low of -82%.

Exhibit 32: Boeing 737 Original/classic – 7-day avg. flights YoY %

Older 737s and 737 Classics have a large freight concentration

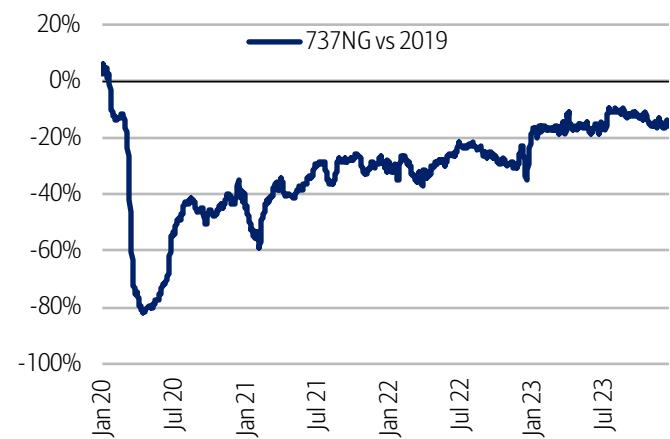


Source: BofA Global Research, Flightradar24

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Exhibit 33: Boeing 737NG – 7-day avg. daily flights YoY %

737NG recovery has gradually recovered



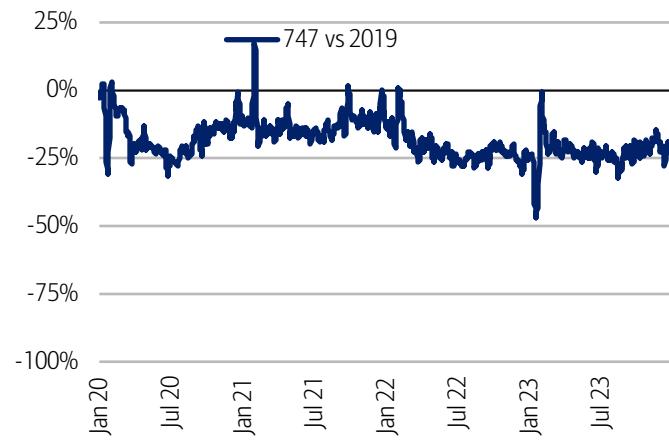
Source: BofA Global Research, Flightradar24

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- Boeing 747** 7-day avg. daily flights were 1.6% YoY and -20.4% vs 2019, declining -6.5 ppts YoY and improving 1.3 ppts over 2019 vs 8.1% YoY and -21.7% over 2019 last week and comparing to a 2020 low of -31.7%.
- Boeing 757** 7-day avg. daily flights were -5.4% YoY and -18.6 % vs 2019, declining -2 ppts YoY and improving 0.6 ppts over 2019 vs -3.4% YoY and -19.1% over 2019 last week and comparing to a 2020 low of -65.6%.
- Boeing 767** 7-day avg. daily flights were -1.1% YoY and -11.4 % vs 2019, declining -4.1 ppts YoY and improving 2.9 ppts over 2019 vs 3% YoY and -14.4% over 2019 last week and comparing to a 2020 low of -46%.

Exhibit 34: Boeing 747 – 7-day avg. daily flights YoY %

747 has been stronger than A380 due to high freight usage in fleet

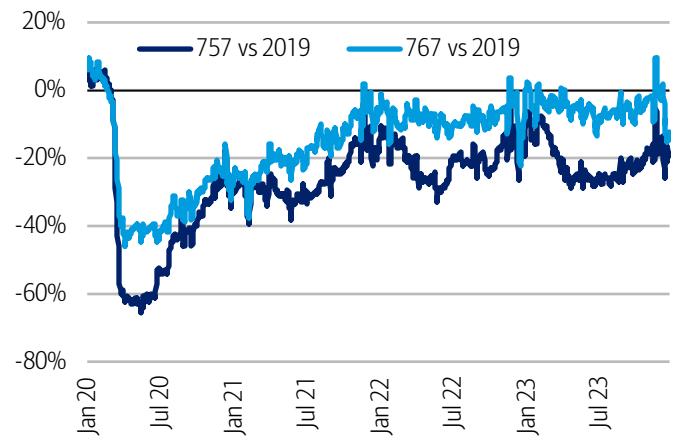


Source: BofA Global Research, Flightradar24

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Exhibit 35: Boeing 757/767 – 7-day avg. flights YoY %

757/767 are both legacy pax platforms with high freight utilisation



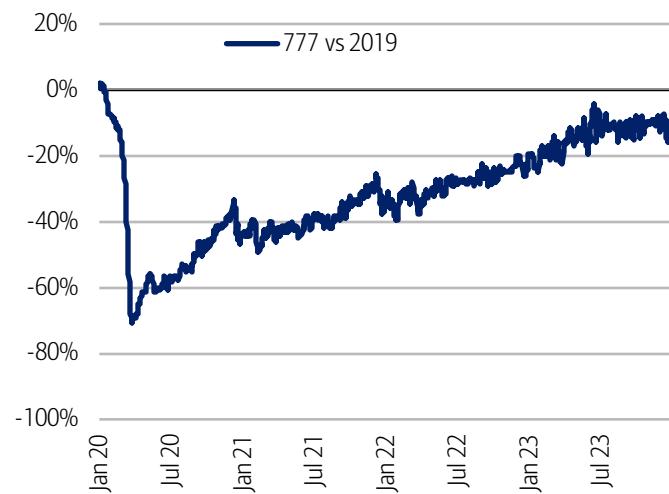
Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

- Boeing 777** 7-day avg. daily flights were 15.2% YoY and -11 % vs 2019, declining 0 ppts YoY and improving 3.9 ppts over 2019 vs 15.2% YoY and -14.9% over 2019 last week and comparing to a 2020 low of -70.7%.
- Boeing 787** 7-day avg. daily flights were 18.8% YoY and 20.8 % vs 2019, improving 0.4 ppts YoY and improving 4.5 ppts over 2019 vs 18.5% YoY and 16.3% over 2019 last week and comparing to a 2020 low of -76.3%.

Exhibit 36: Boeing 777 – 7-day avg. daily flights YoY %

Newer models (e.g., -300ER, -200LR) have been driving a steady recovery of flight cycles

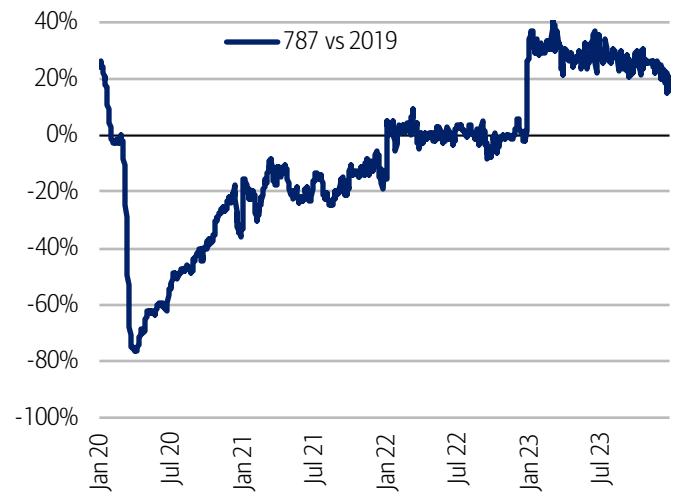


Source: BofA Global Research, Flightradar24

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Exhibit 37: Boeing 787 – 7-day avg. daily flights YoY %

787 already exhibited levels >2019 through 2023



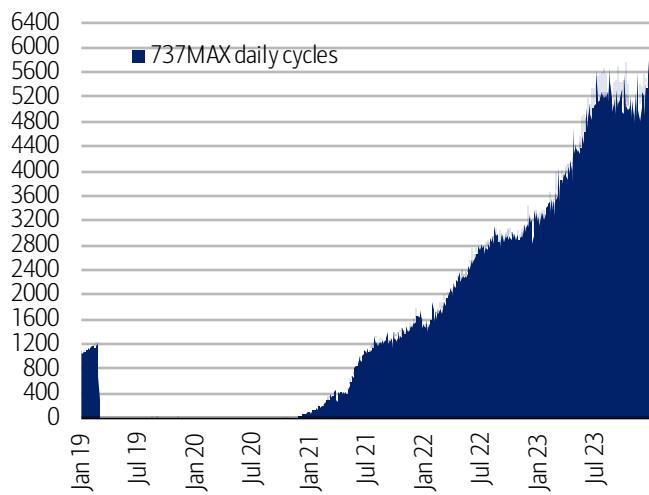
Source: BofA Global Research, Flightradar24

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Exhibit 38: Boeing 737 MAX daily flight cycles

MAX daily cycles have seen a very strong recovery

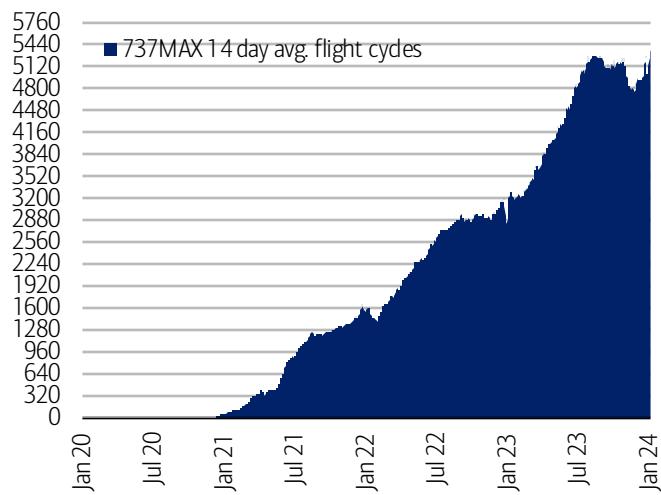


Source: BofA Global Research estimates, Flightradar24

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Exhibit 39: Boeing 737 – 14-day avg. daily flight cycles

Cycles have started to resume as regulators approve aircraft for service



Source: BofA Global Research, Flightradar24

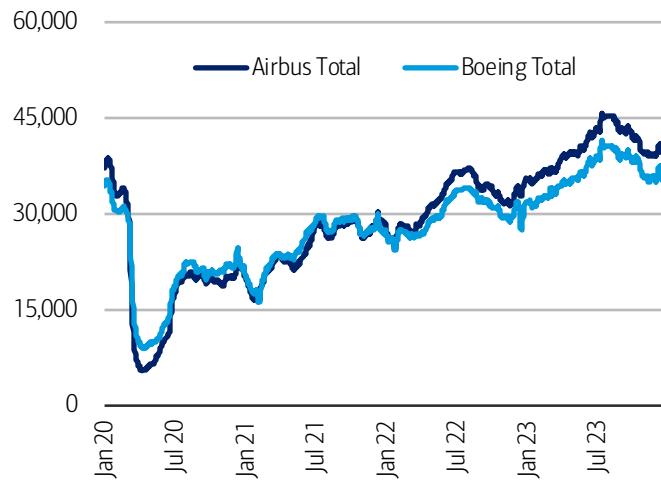
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Airbus vs Boeing: Airframe flight cycles

- Airbus** total fleet 7-day avg. daily flights were 40,153, improving 0.8 ppts vs 39,823 last week. **Boeing** total fleet 7-day avg. daily flights were 35,808, improving 1.6 ppts vs 35,257 last week.

Exhibit 40: Airbus vs Boeing total daily flights 7-day avg.

Airbus vs Boeing cycles have been similar through the pandemic

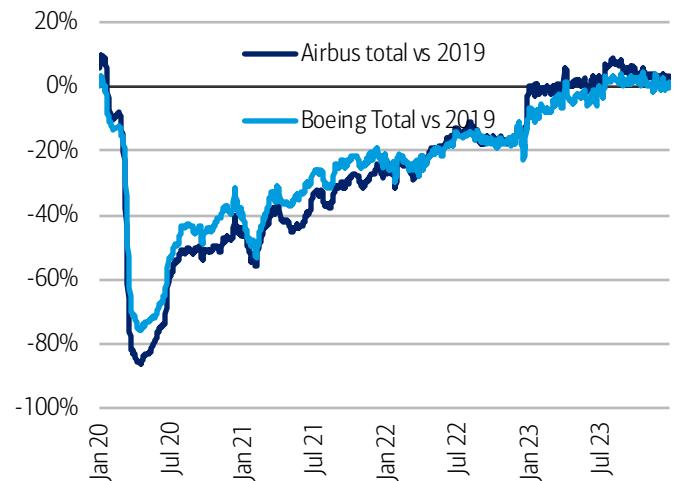


Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 41: Airbus vs Boeing total daily flights 7-day avg. % YoY

Airbus vs Boeing cycles have been similar through the pandemic



Source: BofA Global Research, Flightradar24

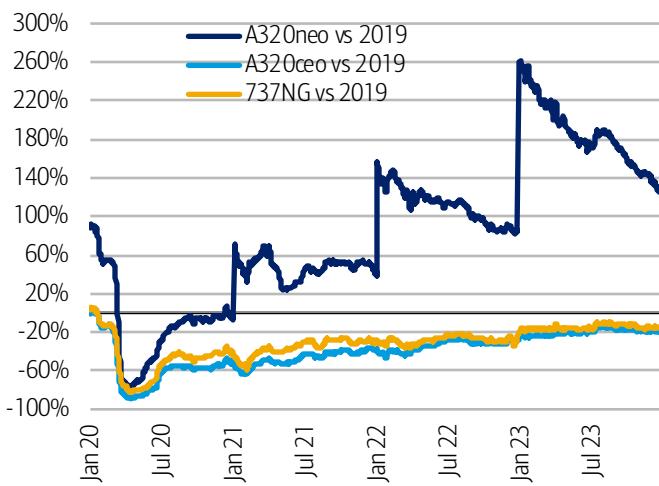
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- A320neo** 7-day rolling avg. daily flights declined to 12.2% YoY and improved to -18.5 % vs 2019 this week, and **A320neo** declined to 20% YoY and declined to 121.4 % vs 2019 this week, whereas **737 NG** declined to 12% YoY and improved to -14.7 % vs 2019 this week.
- A330** 7-day rolling avg. daily flights declined to 32.5% YoY and improved to -17.4 % vs 2019 this week, whereas **777** declined to 15.2% YoY and improved to -11% vs 2019.



Exhibit 42: A320 vs 737NG – 7-day avg. daily flights YoY %

737NG has outperformed A320ceo due to MAX grounding impact on 737 family operators; A320neo strongest due to efficiency, new production

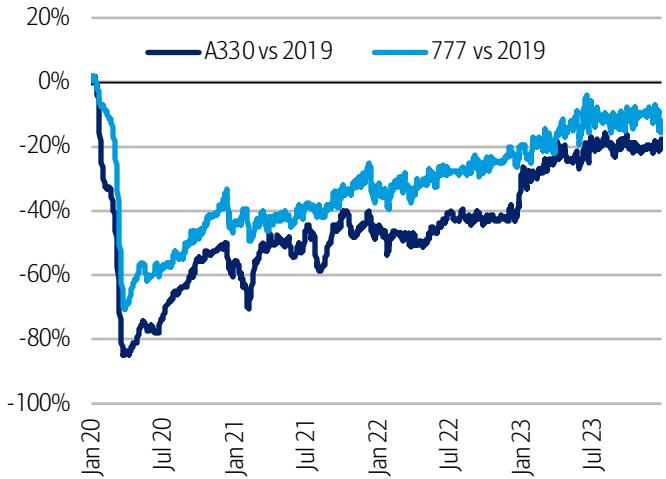


Source: BofA Global Research, Flightradar24

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Exhibit 43: A330 family vs 777 – 7-day avg. daily flights YoY %

777 has outperformed A330 throughout the COVID-19 crisis



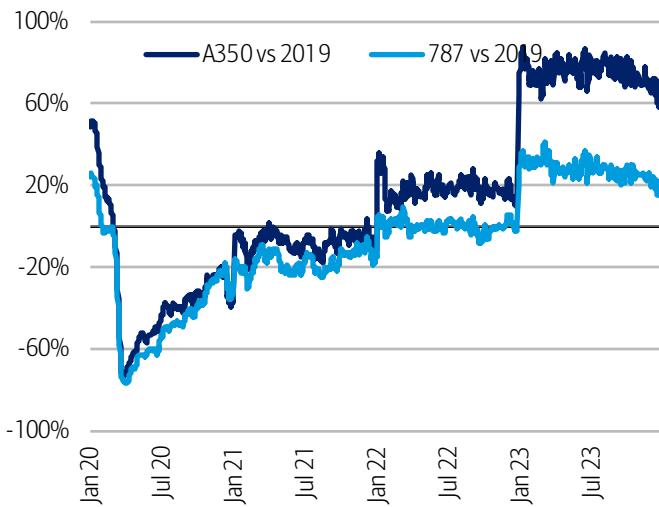
Source: BofA Global Research, Flightradar24

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- A350** 7-day rolling avg. daily flights declined to 44.6% YoY and improved to 64.9 % vs 2019 this week, whereas **787** improved to 18.8% YoY and improved to 20.8% vs 2019.
- A380** 7-day rolling avg. daily flights improved to 23.6% YoY and improved to -30.7 % vs 2019 this week, whereas **747** declined to 1.6% YoY and improved to -20.4% vs 2019.

Exhibit 44: A350 vs 787 – 7-day avg. daily flights YoY %

A350 and 787 YoY cycles have diverged from January 2022 onwards

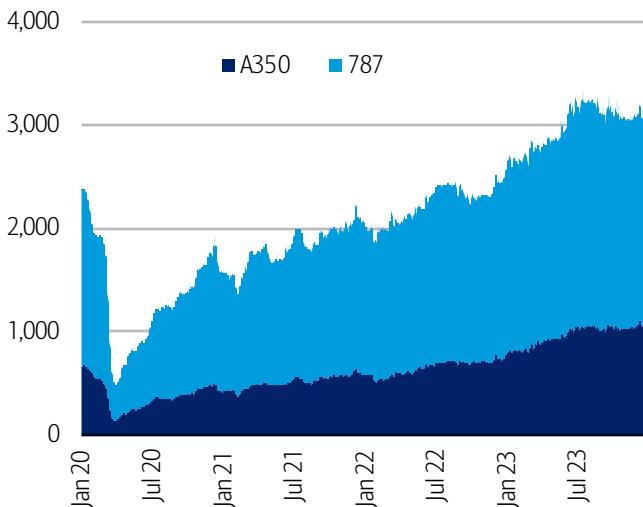


Source: BofA Global Research, Flightradar24

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Exhibit 45: A350 vs 787 total daily flights 7-day avg. total

787 is the market leader in the next-gen large widebody segment



Source: BofA Global Research, Flightradar24

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Exhibit 46: A320ceo vs 737NG total daily flights 7-day avg.

A320ceo and 737 NG YoY cycles have tailed off in the last quarter

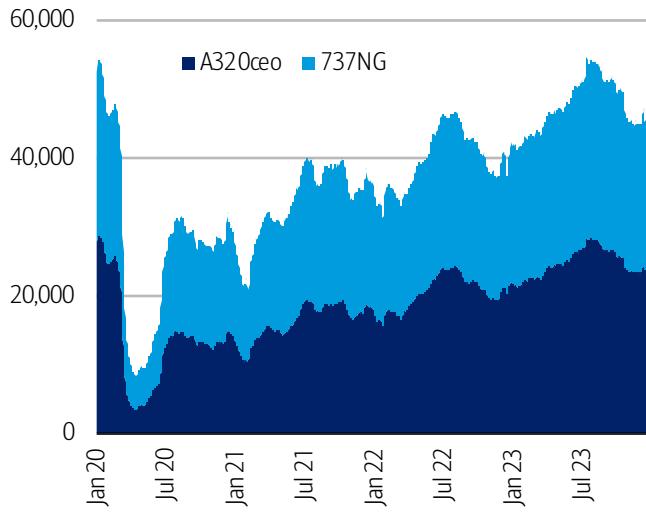


Source: BofA Global Research, Flightradar24

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Exhibit 47: A320ceo vs 737NG total daily flights 7-day avg. total

Total share of cycles between A320ceo and 737NG has been close to 50/50



Source: BofA Global Research, Flightradar24

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Exhibit 48: A380 vs 747 – 7-day avg. daily flights YoY %

A380 has no dedicated freight use (long-haul pax only), whereas 747 has large freighter utilisation (e.g., UPS, Atlas Air)

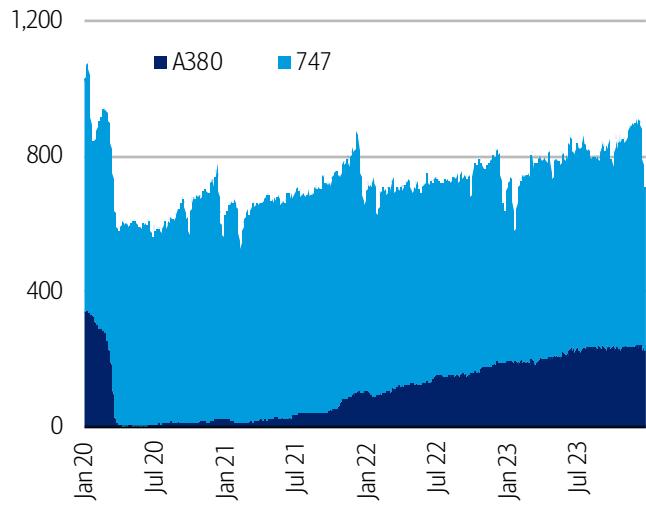


Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 49: A380 vs 747 total daily flights 7-day avg. total

A380 daily cycles are progressively recovering but slow vs. 747



Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

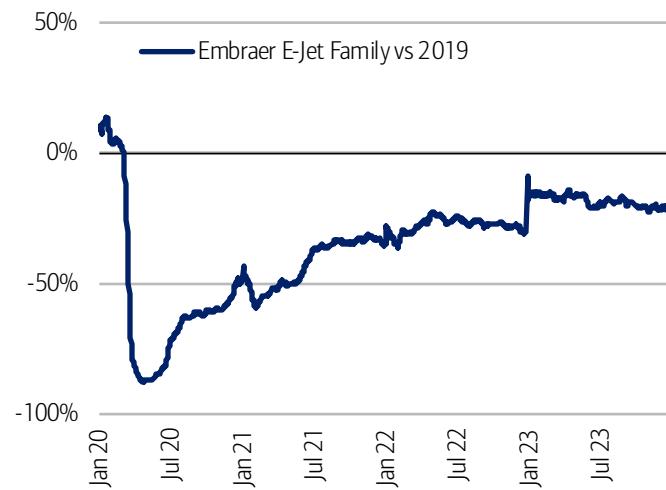


Other: Airframe flight cycles

- Embraer E-Jet** 7-day avg. daily flights were 11.3% YoY and -21.1 % vs 2019, declining -2.5 ppts YoY and improving 0 ppts over 2019 vs 13.8% YoY and -21.1% over 2019 last week and comparing to a 2020 low of -87.4%.
- Airbus A220** 7-day avg. daily flights were 31.1% YoY and 149 % vs 2019 improving 0.4 ppts YoY and improving 5.9 ppts over 2019 vs 30.7% YoY and 143.1% over 2019 last week and comparing to a 2020 low of -73.4%.

Exhibit 50: Embraer E-Jet – 7-day avg. daily flights YoY %

E-Jet (regional jet) has not outperformed narrowbody in recovery



Source: BofA Global Research, Flightradar24

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Exhibit 51: Airbus A220 – 7-day avg. daily flights YoY %

A220 is Airbus' regional single aisle programme



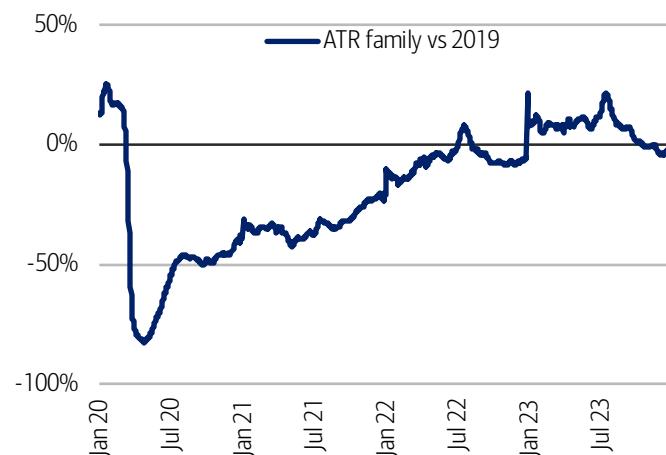
Source: BofA Global Research, Flightradar24

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- ATR Family** 7-day avg. daily flights were 3.8% YoY and -2.7 % vs 2019, declining -0.3 ppts YoY and improving 0.5 ppts over 2019 vs 4.1% YoY and -3.2% over 2019 last week and comparing to a 2020 low of -82.6%.
- Embraer 135/145** 7-day avg. daily flights were -2.6% YoY and -53.3 % vs 2019, declining -4.7 ppts YoY and improving 0.7 ppts over 2019 vs 2.1% YoY and -54% over 2019 last week and comparing to a 2020 low of -79.8%.

Exhibit 52: ATR Family – 7-day avg. daily flights YoY %

ATR is a 48-70 seat turboprop regional aircraft

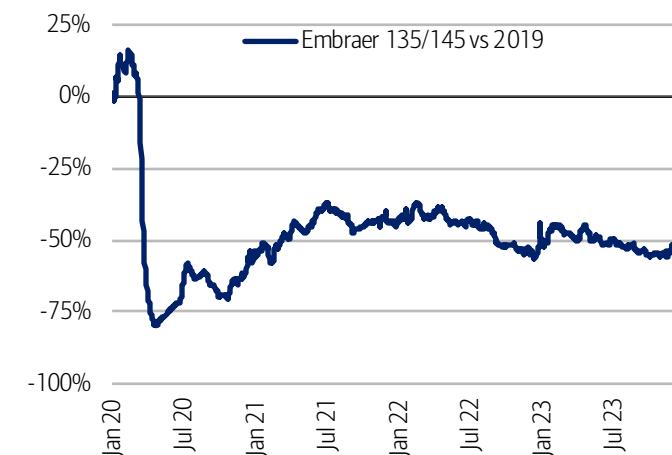


Source: BofA Global Research, Flightradar24

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Exhibit 53: Embraer 135/145 – 7-day avg. daily flights YoY %

ERJ is a 37-50 seat regional aircraft



Source: BofA Global Research, Flightradar24

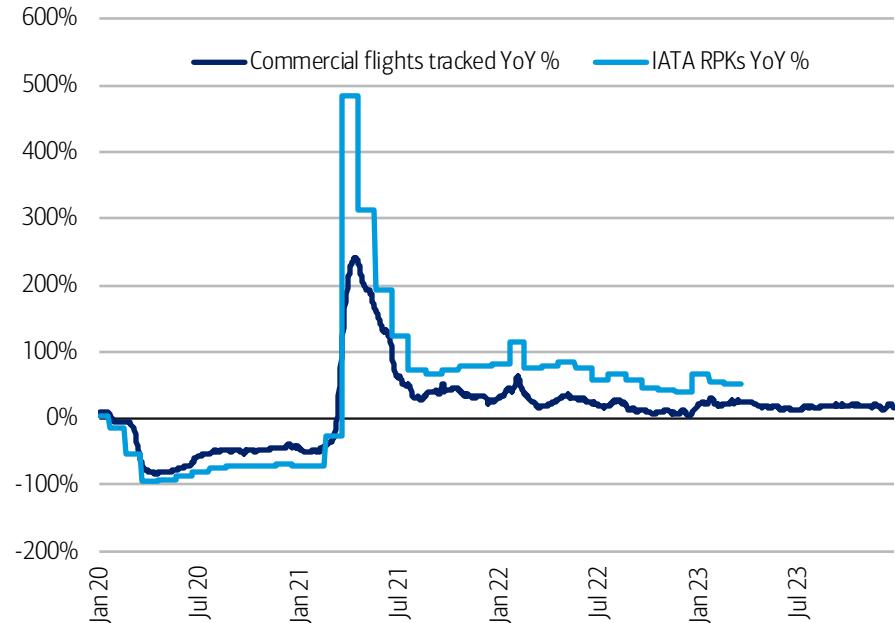
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Global commercial flight cycles

- Global commercial 7-day avg. daily flights were 13.6% YoY and -6.1% vs 2019, declining -6.6 ppts and improving 0.4 ppts vs 20.2% and -6.5% respectively last week and comparing to a 2020 low of -82.5%.

Exhibit 54: Global commercial flights tracked 7-day daily moving average YoY %

IATA RPKs have broadly followed global commercial flight cycles

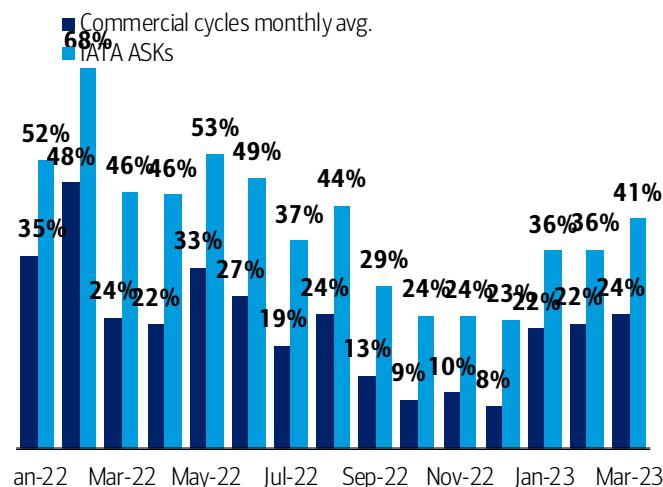


Source: BofA Global Research, Flightradar24

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Exhibit 55: Commercial aircraft monthly daily cycles avg. YoY % vs IATA ASKs

Monthly flight cycles were similar to IATA Available Seat Kilometers (ASKs) ...

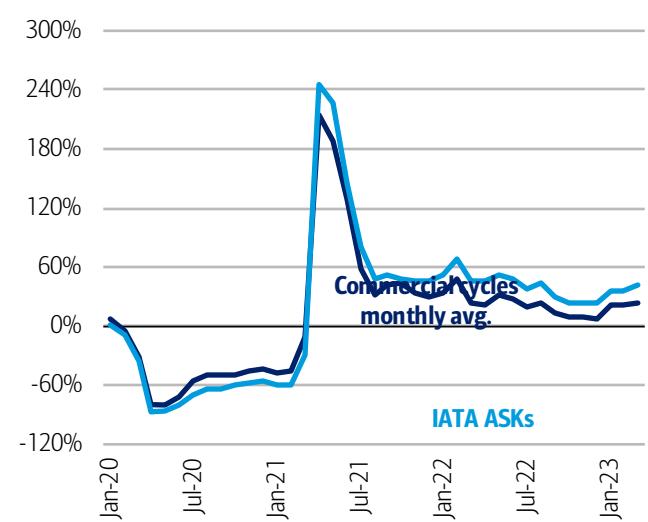


Source: BofA Global Research, Flightradar24

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Exhibit 56: Commercial aircraft monthly daily cycles avg. YoY % vs IATA ASKs

ASKs cycles remain above commercial ones after converging in April 2021



Source: BofA Global Research, Flightradar24

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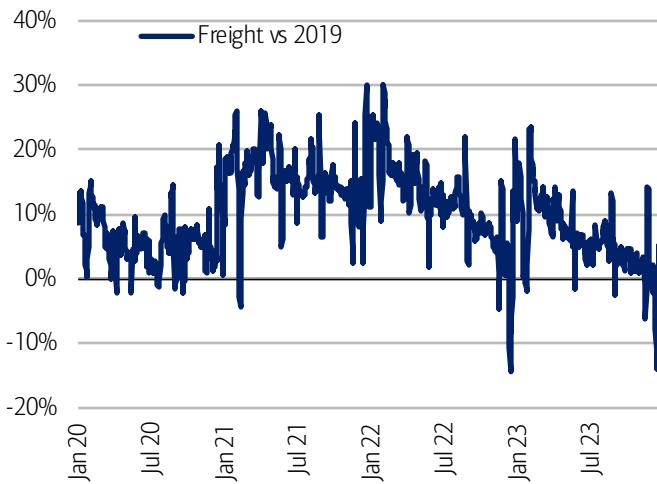


Global freighter cycles

- Global dedicated freighter** 7-day avg. daily flights were -7.7% YoY and 1.7% vs 2019, declining -3.1 ppts and improving 0.7 ppts vs -4.6% and 1%, respectively, last week and comparing to a 2020 low of -2.3%.

Exhibit 57: Global dedicated freighter flights tracked 7-day avg. YoY %

This excludes commercial aircraft used as freighter; it became progressively weaker through 2022-23

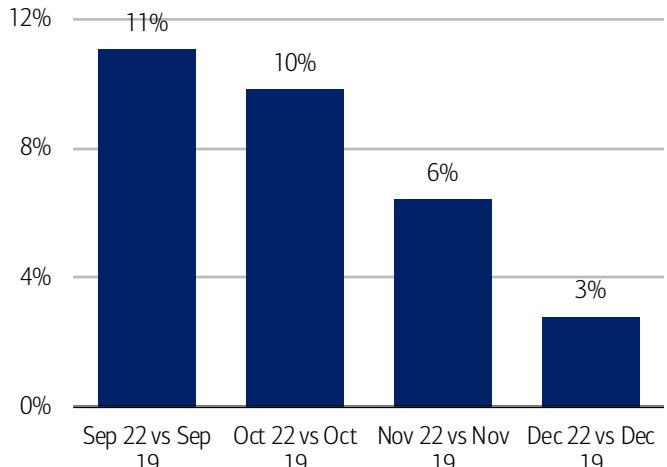


Source: BofA Global Research, Flightradar24

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Exhibit 58: Freight landings September – December 2022 vs 2019

Monthly average number of landings vs 2019 levels have cooled off since September 2022

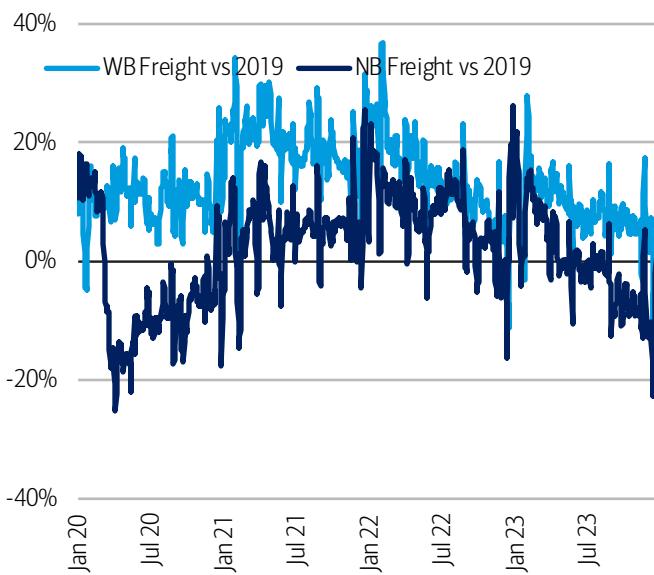


Source: BofA Global Research, Flightradar24

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Exhibit 59: Narrowbody vs Widebody dedicated freighter flights tracked 7-day avg. YoY %

Narrowbody and Widebody freight converged in 3Q22

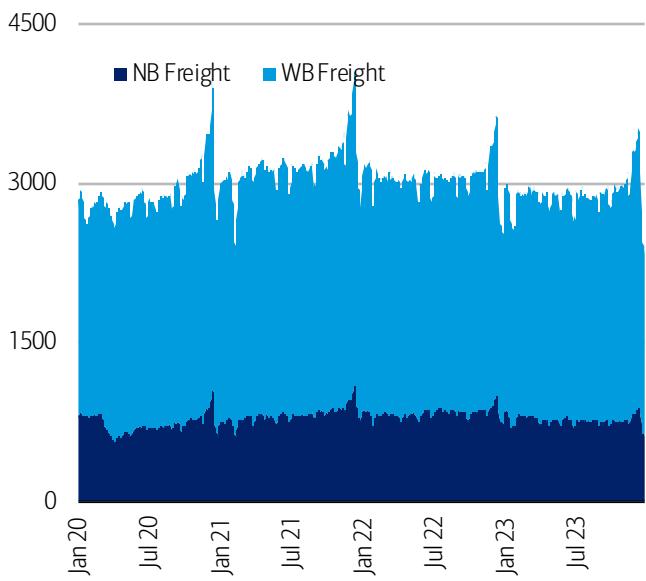


Source: BofA Global Research, Flightradar24

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Exhibit 60: Narrowbody vs Widebody dedicated freighter flights daily

Freight cycles typically peak around the holiday period in December

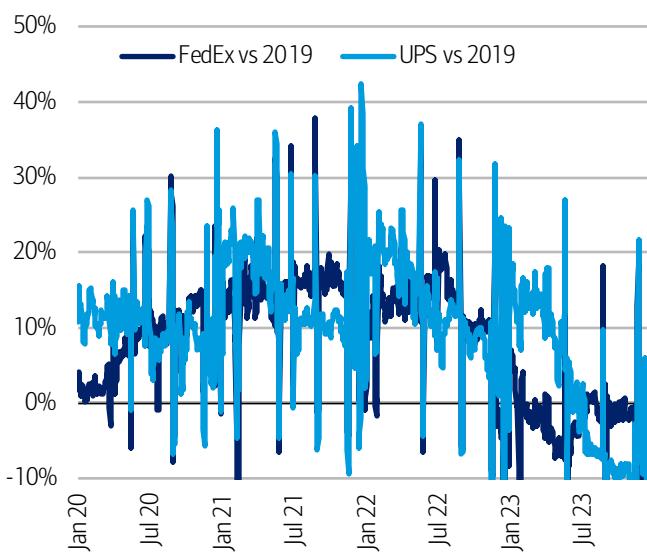


Source: BofA Global Research, Flightradar24

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Cargo airline cycles

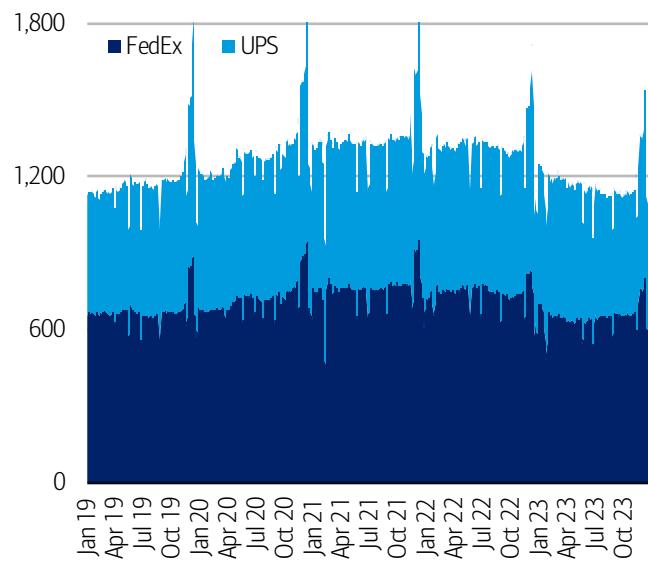
Exhibit 61: FedEx & UPS 7-day avg. daily flights vs 2019
FedEx and UPS were the 1st- and 2nd-largest global cargo airlines in 2019



Source: BofA Global Research, Flightradar24

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Exhibit 62: FedEx & UPS 7-day avg. daily flights total
Freight cycles reduced slightly through FY22-23



Source: BofA Global Research, Flightradar24

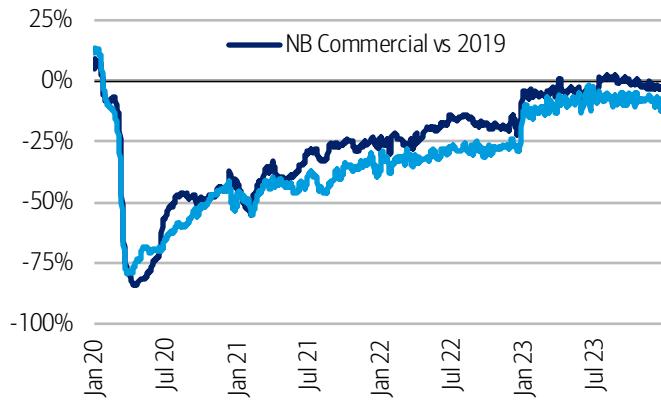
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Narrowbody vs widebody cycles

- **Global commercial narrowbody** 7-day rolling avg. daily flights declined to 15.7 % YoY and improved to -2.8% vs 2019 this week, whereas **commercial widebody** declined to 17.1 % YoY and improved to -8.6% vs 2019.

Exhibit 63: Narrowbody vs widebody 7-day avg. flights vs 2019

Narrowbody has led the recovery, largely as expected, but widebody traffic is catching up

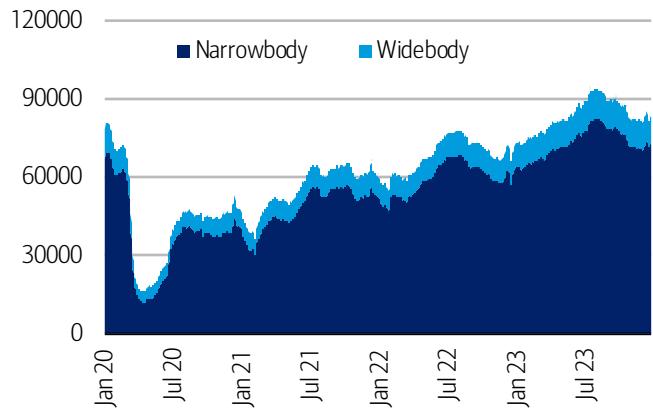


Source: BofA Global Research, Flightradar24

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Exhibit 64: Narrowbody vs widebody 7-day avg. flights total

Both narrowbody and widebody cycles continued to recover through FY23



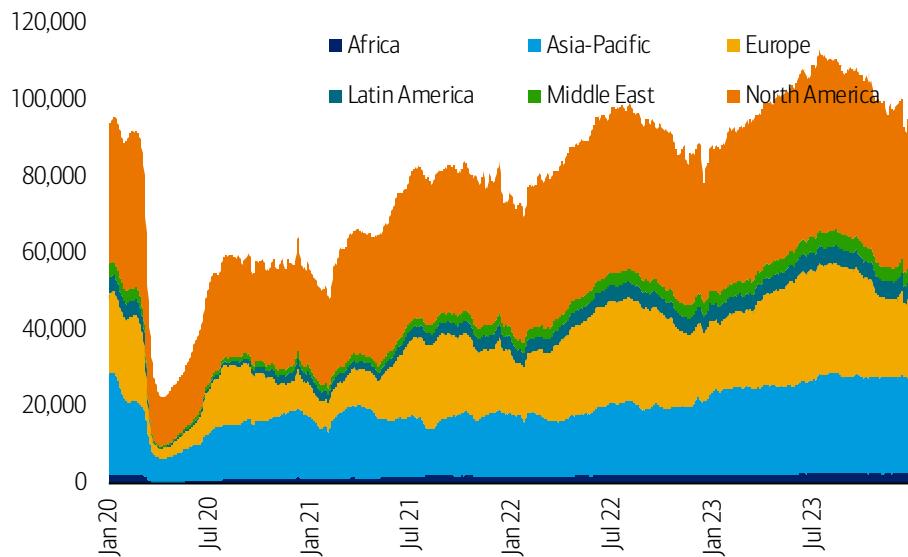
Source: BofA Global Research, Flightradar24

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Commercial flights regional split

Exhibit 65: Global commercial flights daily tracked 7-day avg. by region

North America is the largest region globally for daily flight cycles tracked

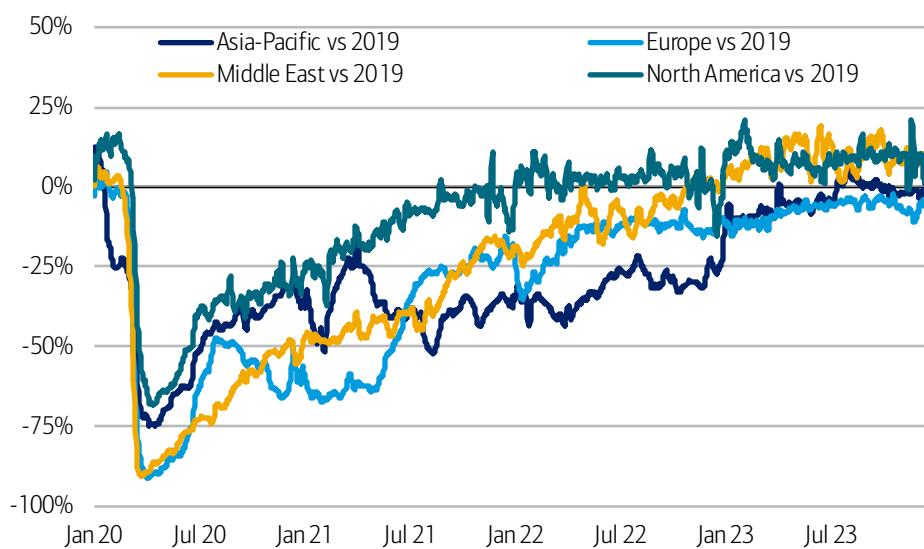


Source: BofA Global Research, Flightradar24

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Exhibit 66: Global commercial flights daily tracked 7-day avg. vs 2019

North America was the most resilient region throughout 2022-23, but all regions have continued to recover



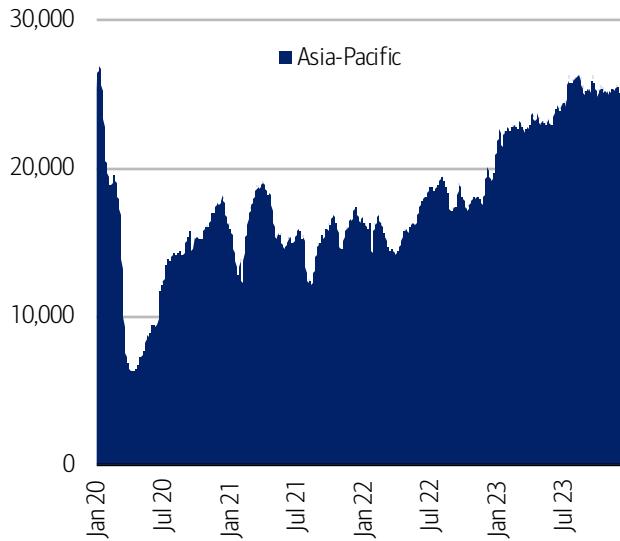
Source: BofA Global Research, Flightradar24

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- **Asia Pacific** 7-day avg. daily flights were 25.1% YoY and -3.4 % vs 2019, declining -5.3 ppts YoY and improving 0 ppts over 2019 vs 30.4% YoY and -3.4% over 2019 last week and comparing to a 2020 low of -74.7%.

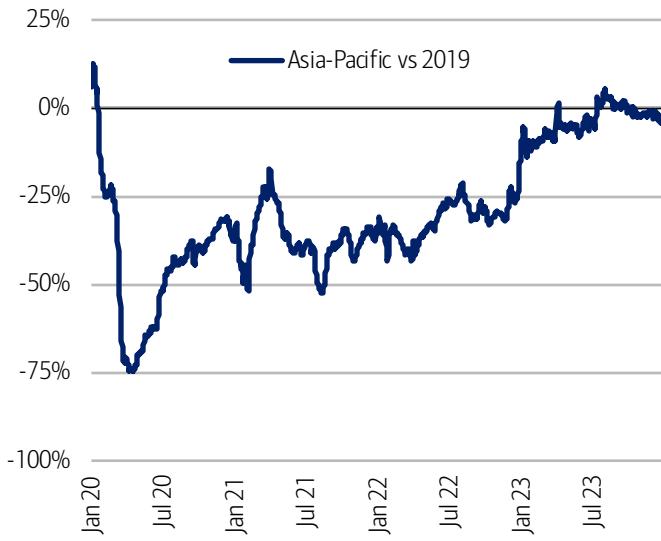
Exhibit 67: Asia-Pacific commercial daily flights 7-day avg.
APAC cycles improved through 2023



Source: BofA Global Research, Flightradar24

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Exhibit 68: APAC commercial flights daily tracked 7-day avg. YoY %
APAC cycles improved through FY23

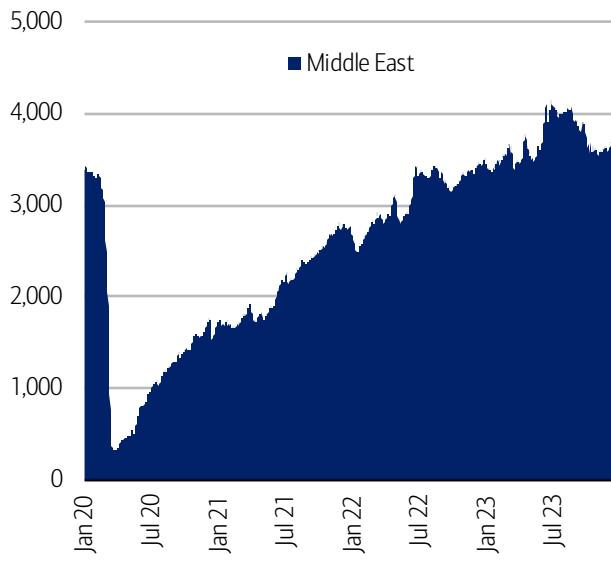


Source: BofA Global Research, Flightradar24

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- **Middle East** 7-day avg. daily flights were 8.6% YoY and 8.5 % vs 2019, improving 1.1 ppts YoY and improving 2.2 ppts over 2019 vs 7.5% YoY and 6.4% over 2019 last week and comparing to a 2020 low of -90.4%.

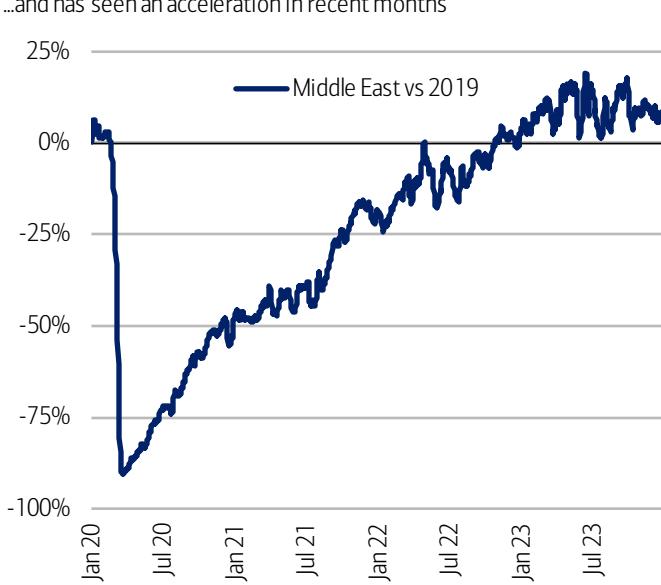
Exhibit 69: Middle East commercial daily flights 7-day avg.
Middle East has already recovered to pre-pandemic levels....



Source: BofA Global Research, Flightradar24

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Exhibit 70: Middle East commercial flights daily tracked 7-day avg. YoY %
...and has seen an acceleration in recent months



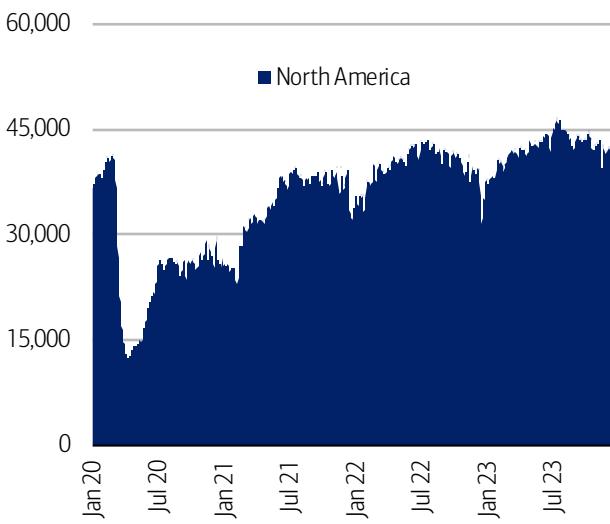
Source: BofA Global Research, Flightradar24

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- North America** 7-day avg. daily flights were 8.4% YoY and 4.4 % vs 2019, declining -4.7 ppts YoY and improving 3.2 ppts over 2019 vs 13% YoY and 1.1% over 2019 last week and comparing to a 2020 low of -68.2%.

Exhibit 71: North America commercial daily flights 7-day avg.

North America cycles saw some improvement in 2023

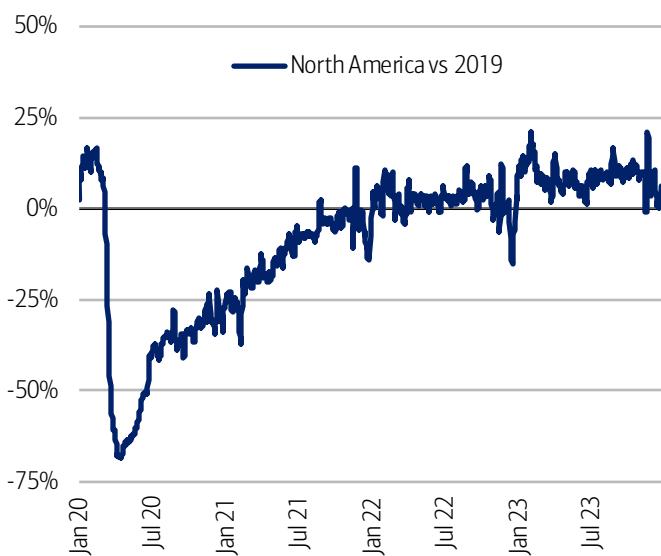


Source: BofA Global Research, Flightradar24

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Exhibit 72: North America commercial flights daily tracked 7-day avg. YoY %

North America cycles saw some improvement in 2023



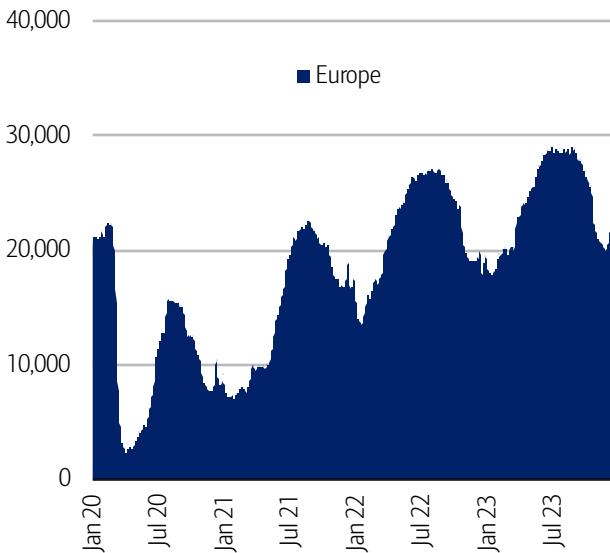
Source: BofA Global Research, Flightradar24

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- Europe** 7-day avg. daily flights were 7.2% YoY and -4.3 % vs 2019, declining -0.3 ppts YoY and declining -0.5 ppts over 2019 vs 7.5% YoY and -3.8% over 2019 last week and comparing to a 2020 low of -90.8%.

Exhibit 73: Europe commercial daily flights 7-day avg.

Europe cycles are the most volatile during the summer period

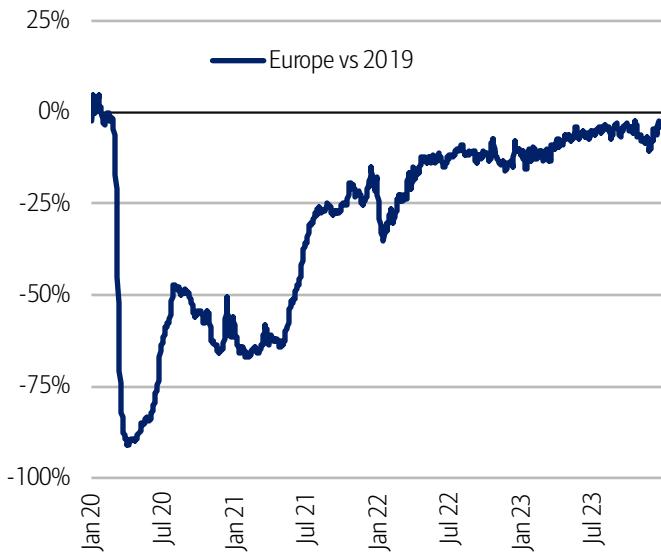


Source: BofA Global Research, Flightradar24

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Exhibit 74: Europe commercial flights daily tracked 7-day avg. YoY %

European commercial flights are still below 2019 levels



Source: BofA Global Research, Flightradar24

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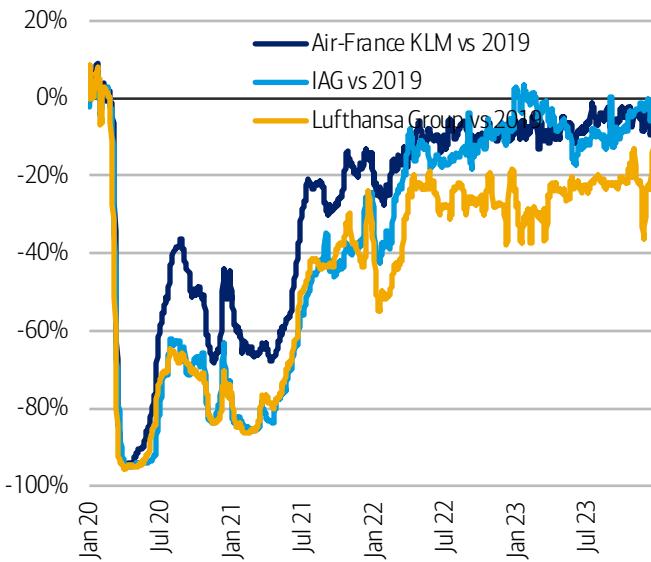


Global airline flight cycles

European airline flight cycles

Exhibit 75: EU Legacy carrier groups 7-day avg. daily flights vs 2019

Air France-KLM and IAG are largely recovered

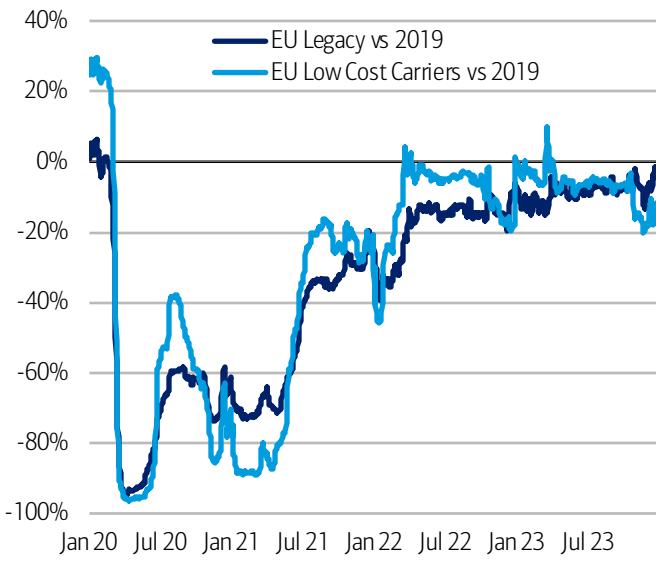


Source: BofA Global Research, Flightradar24

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Exhibit 76: EU LCCs 7-day avg. daily flights vs 2019

Low-cost carriers' recovery has slowed in the last couple of months

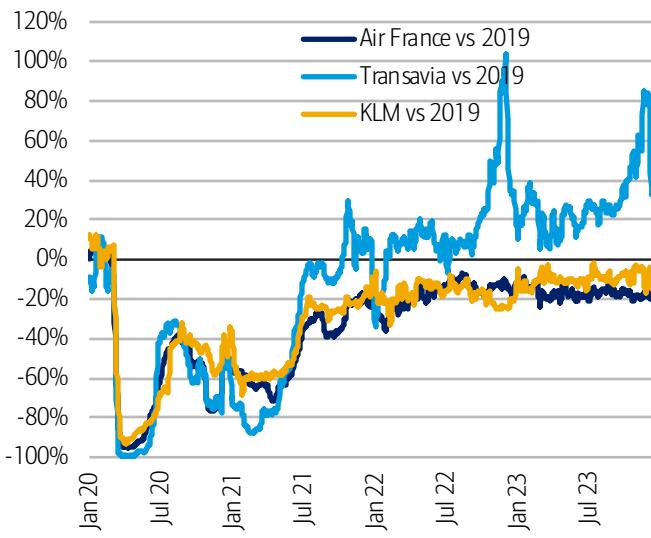


Source: BofA Global Research, Flightradar24

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Exhibit 77: Air France-KLM 7-day avg. daily flights vs 2019

Transavia exhibited the strongest performance YTD

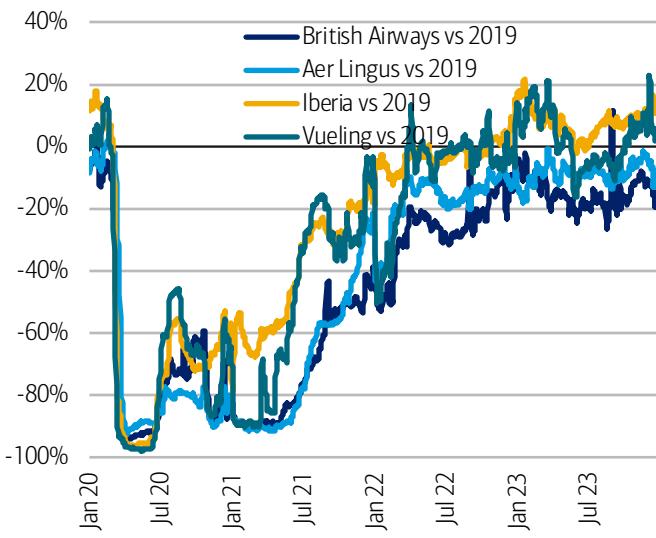


Source: BofA Global Research, Flightradar24

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Exhibit 78: IAG Group 7-day avg. daily flights vs 2019

Iberia and Vueling have outperformed British Airways and Aer Lingus



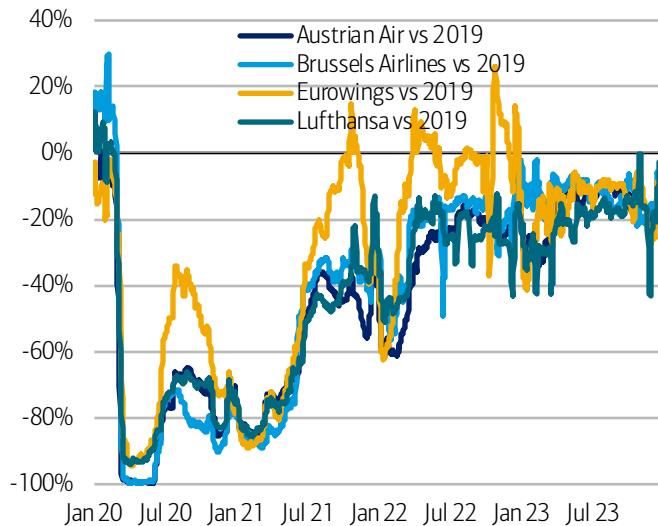
Source: BofA Global Research, Flightradar24

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Exhibit 79: Lufthansa Group 7-day avg. daily flights vs 2019

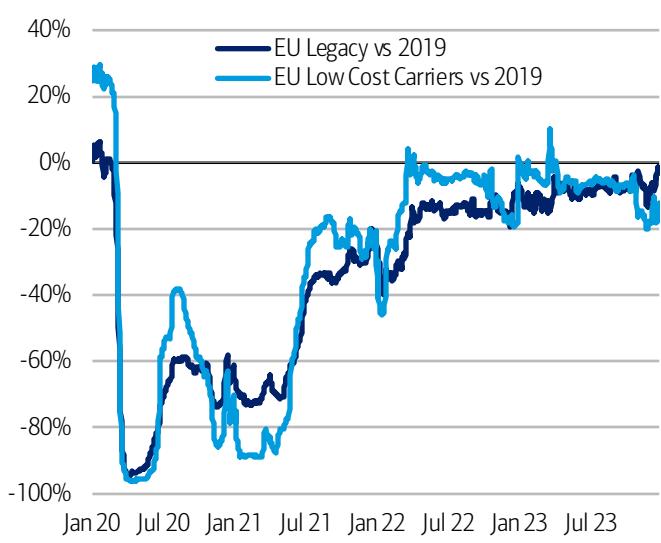
Eurowings (LCC) has recovered to 2019 levels.



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Exhibit 80: Legacy vs Low Cost Carriers 7-day avg. daily flights vs 2019

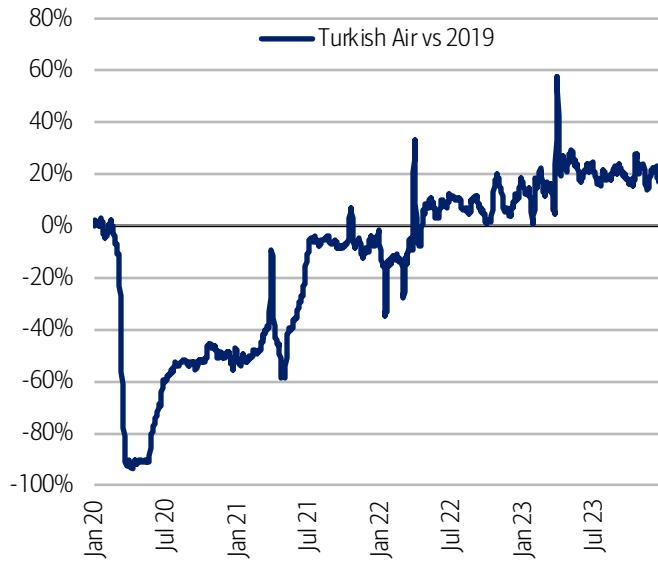
Low-cost carriers outperformed legacy carriers during 2nd/3rd quarters of 2022



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Other European airlines**Exhibit 81: Turkish Airlines 7-day avg. daily flights YoY %**

Turkish Airlines is already above 2019 levels



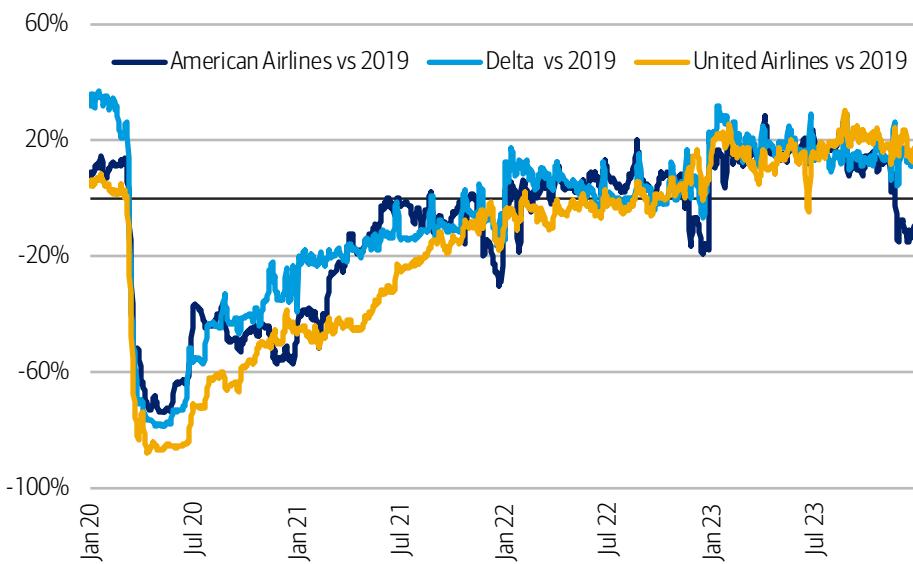
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North American airline flight cycles

Exhibit 82: US Big 3 Airlines 7-day avg. daily flights vs 2019

US Airlines largely performed in line with each other through 2022

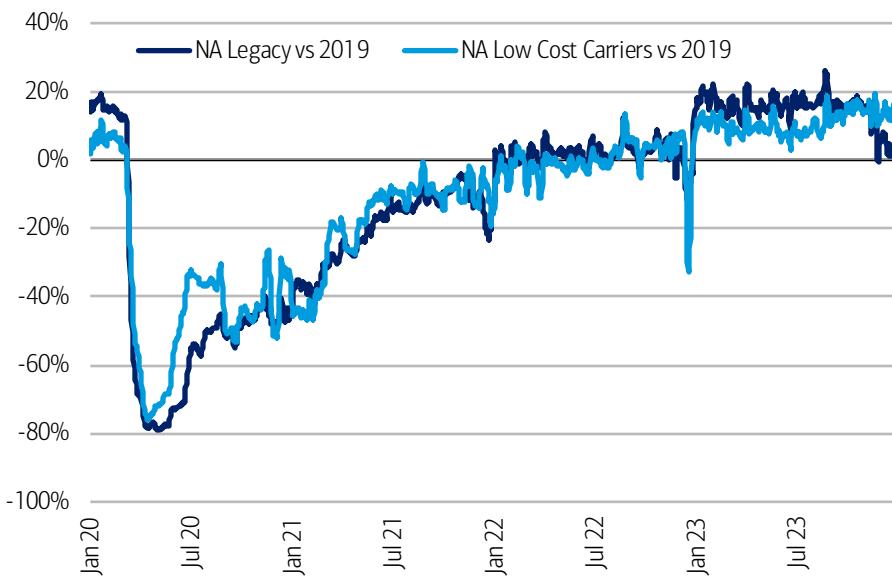


Source: BofA Global Research, Flightradar24

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Exhibit 83: North America (NA) legacy vs NA low-cost carriers 7-day rolling avg. daily flights YoY

Legacy carriers are slightly outperforming low-cost carriers YTD in North America



Source: BofA Global Research, Flightradar24

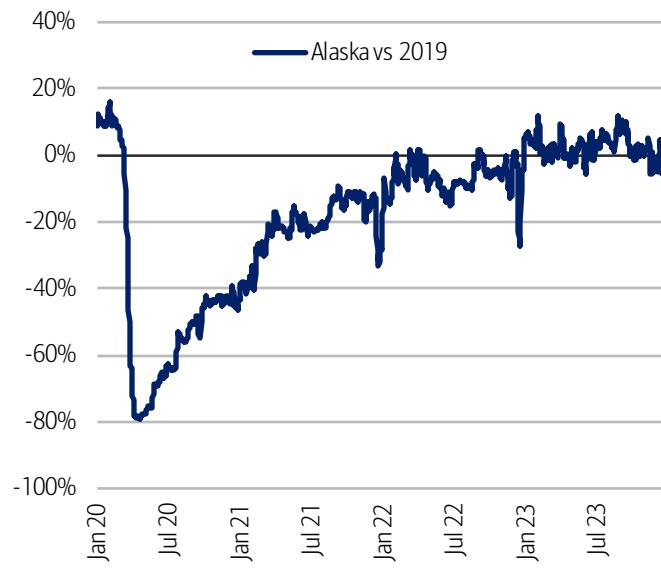
Note: Legacy carriers include Air Canada, Alaska Airlines, American Airlines, Delta, United Airlines. Low-Cost Carriers include Allegiant, Frontier Airlines, JetBlue, Southwest Airlines, Spirit

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NA other airlines

Exhibit 84: Alaska Airlines 7-day avg. daily flights YoY

Alaska Airlines has recovered to above pre COVID levels

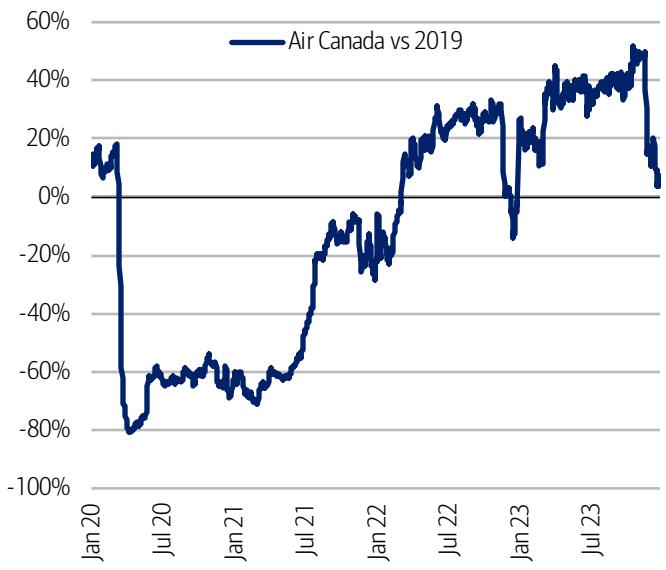


Source: BofA Global Research, Flightradar24

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Exhibit 85: Air Canada Airlines 7-day avg. daily flights YoY

Air Canada has been above 2019 levels since February 2022

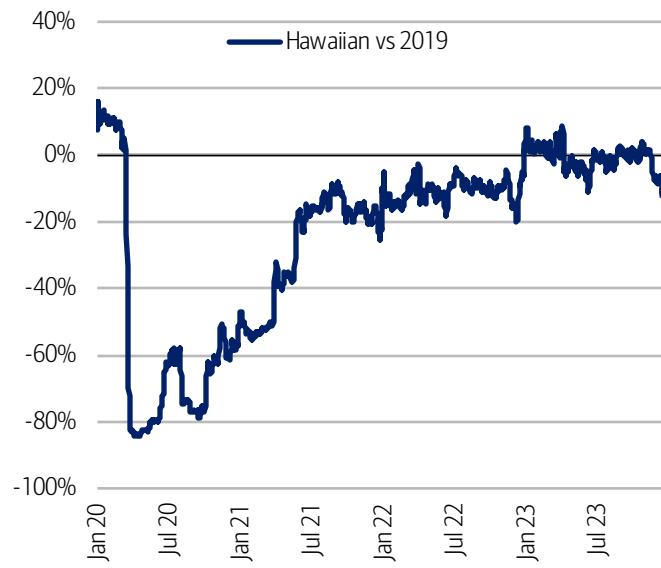


Source: BofA Global Research, Flightradar24

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Exhibit 86: Hawaiian Airlines 7-day avg. daily flights YoY

Hawaiian has recovered to above pre COVID levels



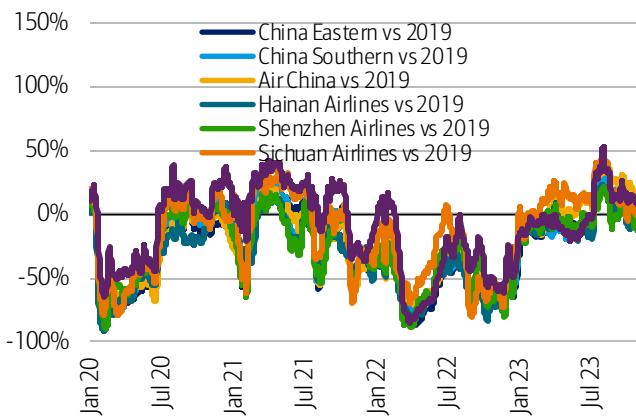
Source: BofA Global Research, Flightradar24

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Asia-Pacific airline flight cycles

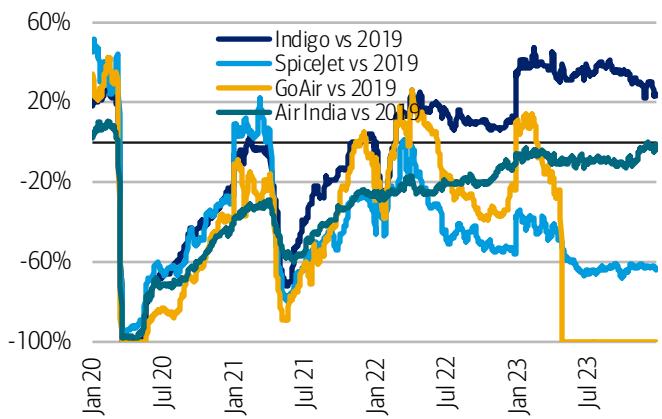
Exhibit 87: Chinese Airlines 7-day avg. daily flights vs 2019
Volatility in cycles reflects the COVID restrictions through 2020-23



Source: BofA Global Research, Flightradar24

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Exhibit 88: Indian Airlines 7-day avg. daily flights vs 2019
Indigo is the only Indian Airline above 2019 levels

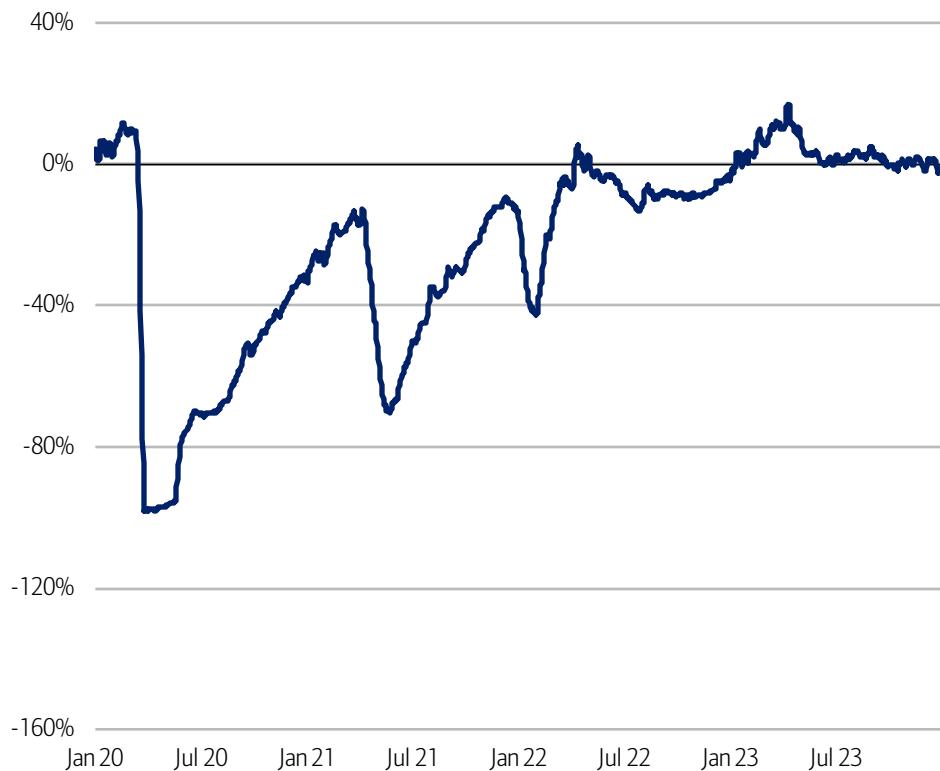


Source: BofA Global Research, Flightradar24

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Exhibit 89: India 7-day average flights

Indian flights are now ahead of pre-COVID levels

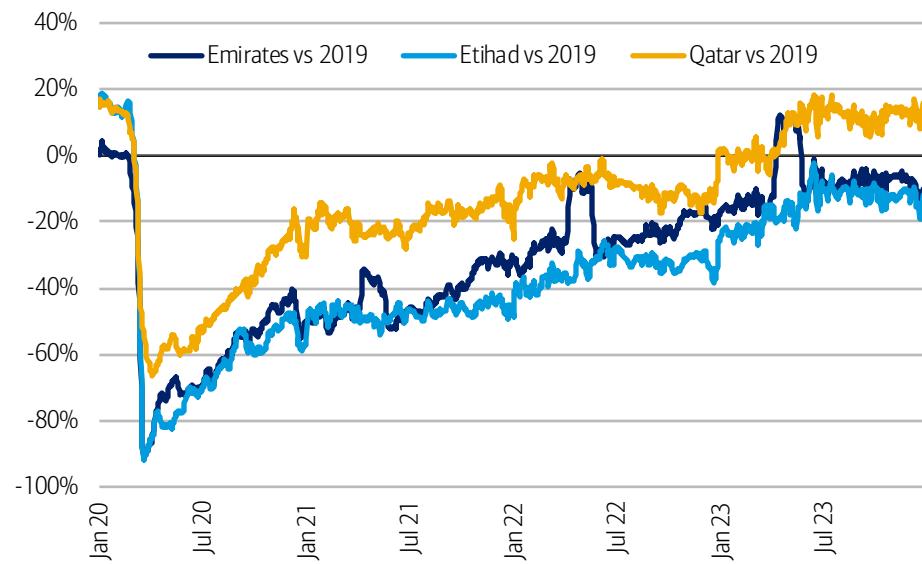


Source: BofA Global Research, Flightradar24

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Exhibit 90: Middle East Airlines 7-day avg. daily flights vs 2019

The big-three gulf carriers are heavily reliant on long-haul international travel, with a hub-and-spoke business model utilising large widebody aircraft (e.g., 787, 777, A380, A350); Qatar has performed the most resiliently throughout the COVID-19 crisis compared to 2019 levels



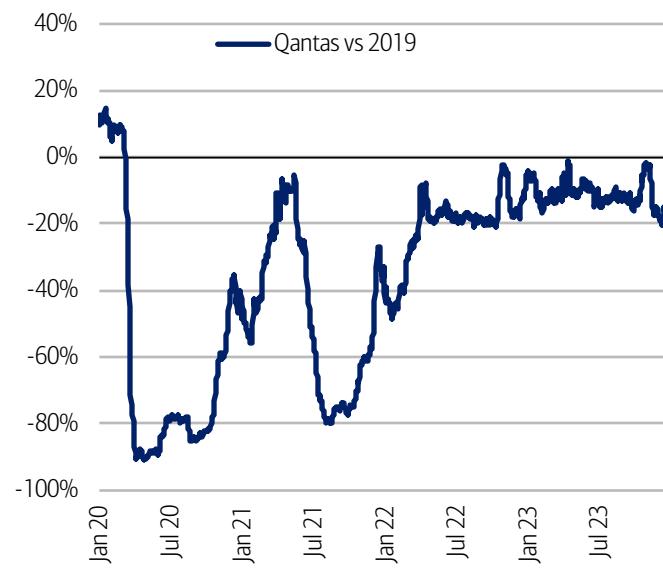
Source: BofA Global Research, Flightradar24

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APAC other airlines

Exhibit 91: Qantas Airlines 7-day avg. daily flights YoY

Qantas flights fell strongly over the summer 2021 but rebounded strongly through FY22 and plateaued in FY23

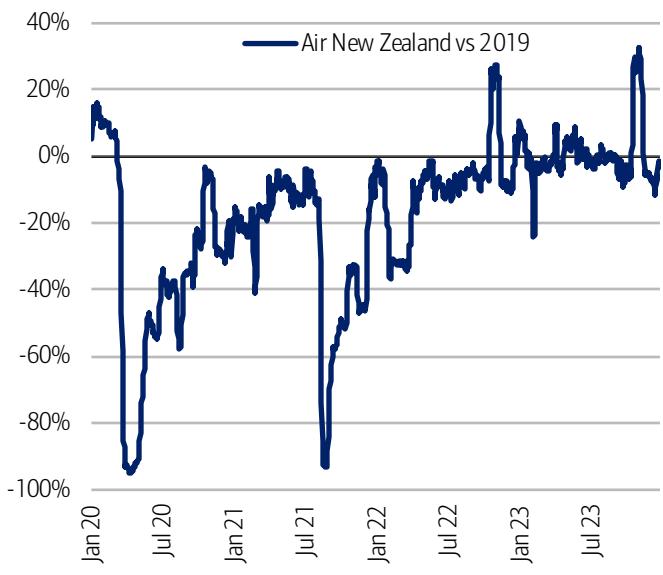


Source: BofA Global Research, Flightradar24

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Exhibit 92: Air New Zealand 7-day avg. daily flights YoY

NZ flights have broadly recovered to pre-COVID levels



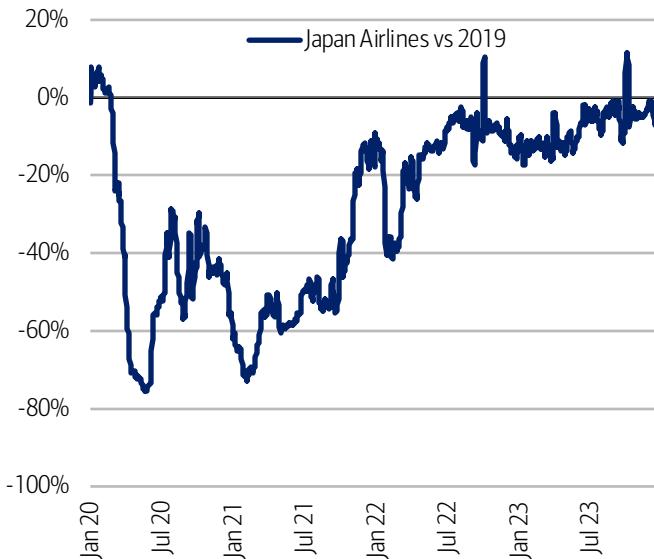
Source: BofA Global Research, Flightradar24

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Exhibit 93: Japan Airlines 7-day avg. daily flights YoY

JAL flights have largely recovered to pre-COVID levels



Source: BofA Global Research, Flightradar24

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Exhibit 94: ANA 7-day avg. daily flights YoY

ANA flights are already above 2019 levels

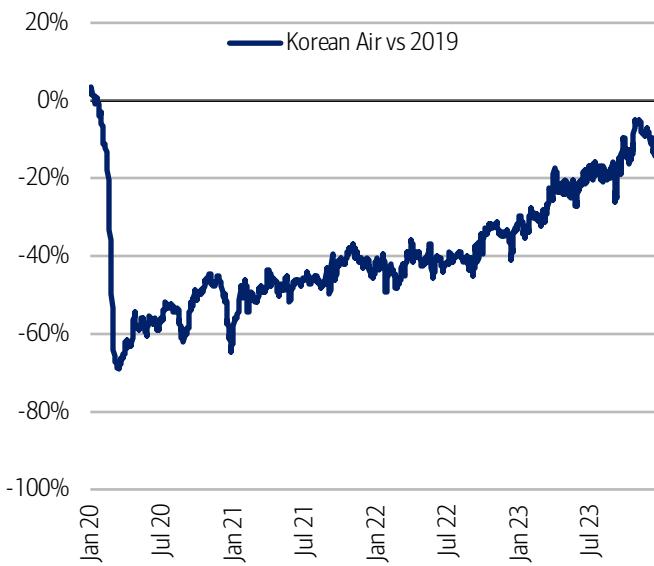


Source: BofA Global Research, Flightradar24

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Exhibit 95: Korean Air 7-day avg. daily flights YoY

Korean Air cycles have started a gradual recovery since July 2022

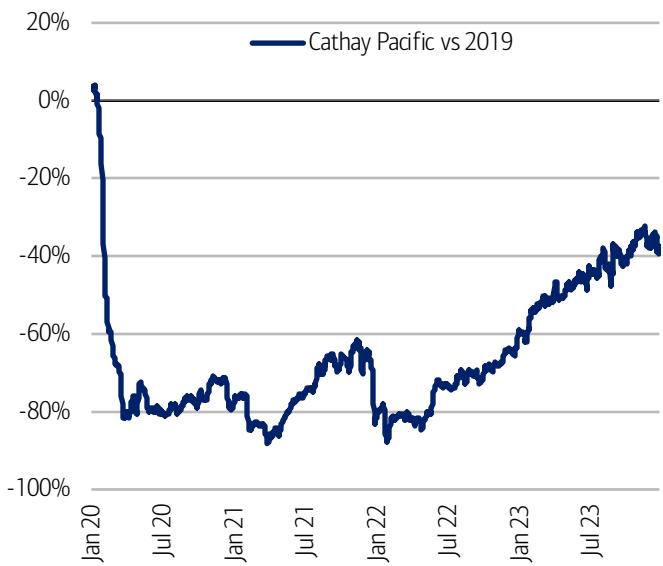


Source: BofA Global Research, Flightradar24

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Exhibit 96: Cathay Pacific 7-day avg. daily flights YoY

Cathay Pacific remains significantly below 2019 levels



Source: BofA Global Research, Flightradar24

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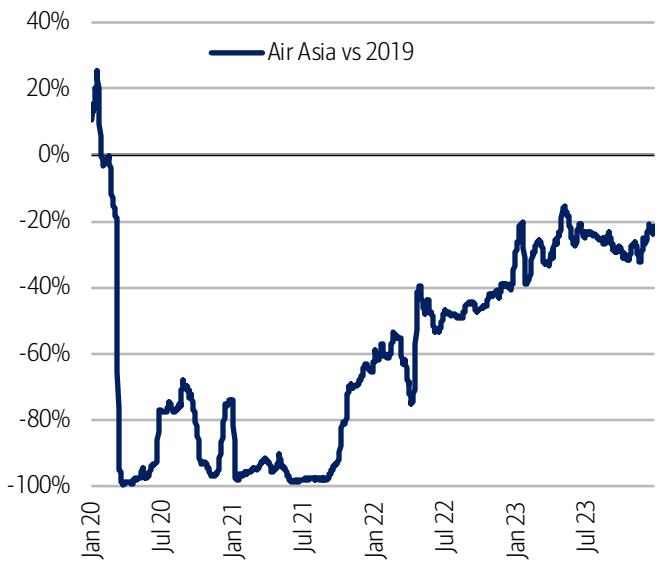
Exhibit 97: Singapore Airlines 7-day avg. daily flights YoY
 Singapore Airlines has been above 2022 levels since February 2022



Source: BofA Global Research, Flightradar24

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Exhibit 98: AirAsia 7-day avg. daily flights YoY
 AirAsia cycles are -20% vs. FY19



Source: BofA Global Research, Flightradar24

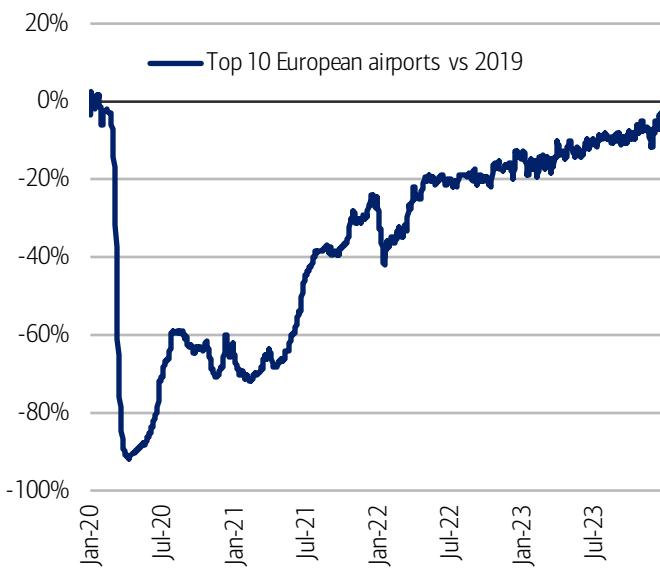
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Global airport cycles

Exhibit 99: Top 10 European airports 7-day avg. daily flights YoY %

European airports traffic gradually recovered through FY23



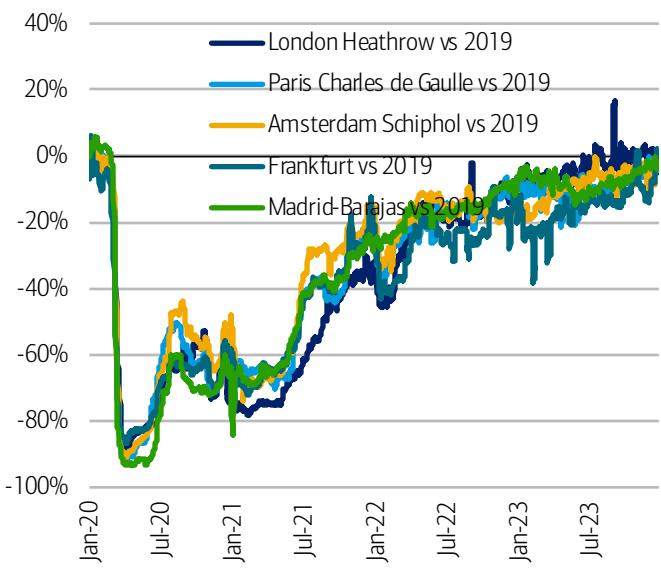
Source: BofA Global Research, Flightradar24

Note: Includes London Heathrow, Paris CDG, Amsterdam, Frankfurt, Madrid, Barcelona, Istanbul, Moscow, Munich, Rome Fiumicino

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Exhibit 100: European airports 7-day avg. daily flights vs 2019

Heathrow is the most recovered airport through summer 2023

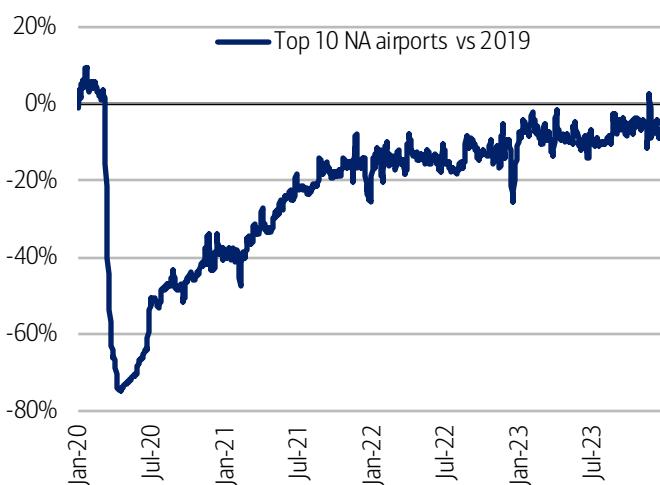


Source: BofA Global Research, Flightradar24

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Exhibit 101: Top 10 NA airports 7-day avg. daily flights YoY %

NA cycles have been more resilient than Europe due to domestic mix



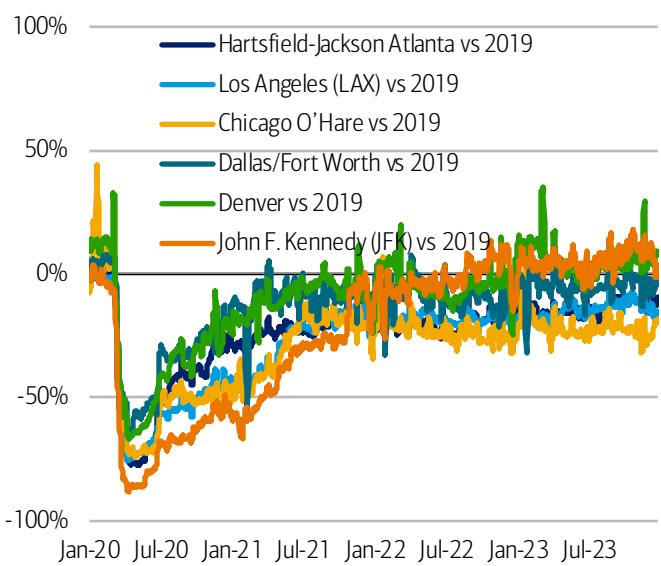
Source: BofA Global Research, Flightradar24

Note: Includes Hartsfield, Los Angeles, Chicago O'Hare, Dallas/Fort-Worth, Denver, New York JFK, San Francisco, McCarran, Seattle-Tacoma, Toronto Pearson

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Exhibit 102: NA airports 7-day avg. daily flights vs 2019

Once the recovery was under way, international airports (i.e., JFK) have exhibited better performance than regional ones (i.e., Chicago O'Hare)



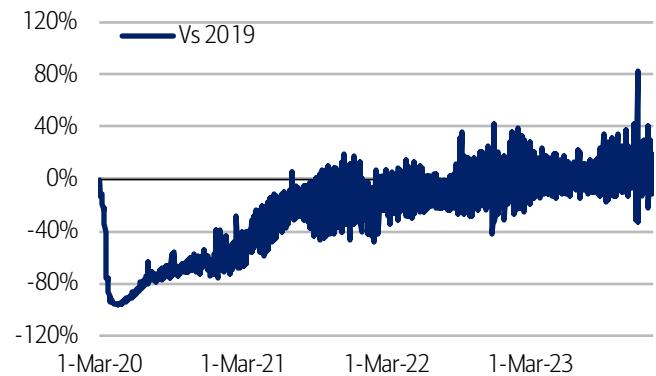
Source: BofA Global Research, Flightradar24

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Exhibit 103: US TSA Security throughput vs 2019 levels

US TSA throughput progressively improved through 2022

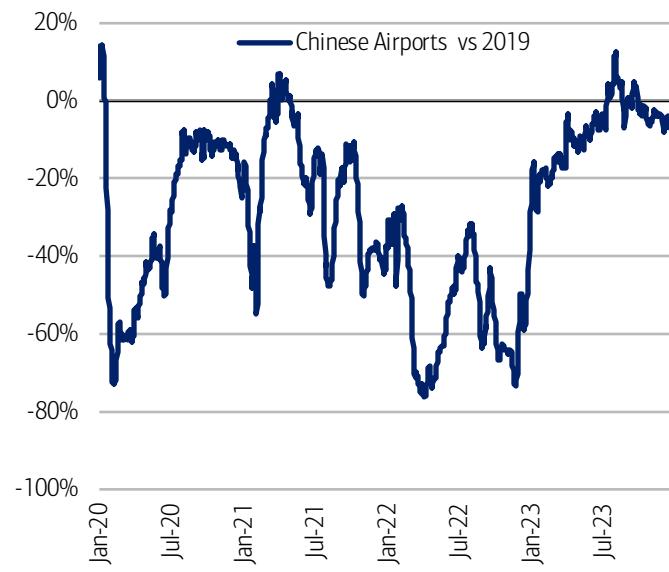


Source: TSA

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Exhibit 104: Chinese airports 7-day avg. daily flights YoY

Airports in China have largely recovered to 2019 levels



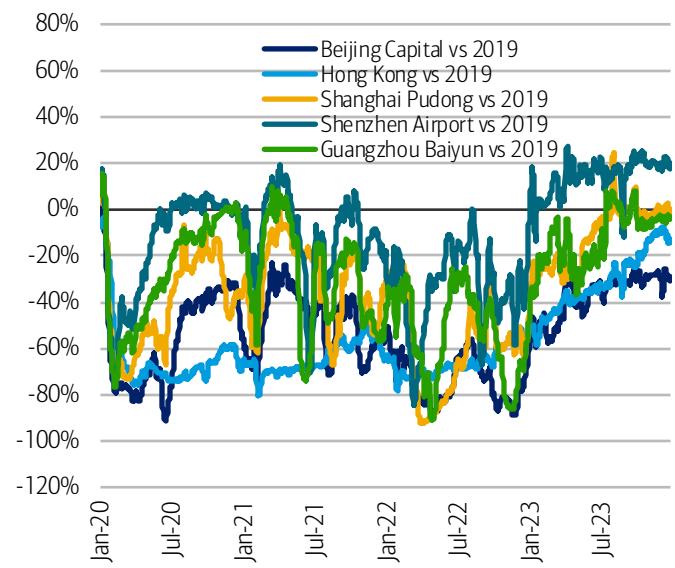
Source: BofA Global Research, Flightradar24

Note: Includes Beijing Capital, Beijing Daxing, Haikou Meilan, Hong Kong, Sanya Phoenix, Shanghai Hongqiao, Shanghai Pudong, Shenzhen, Guangzhou Baiyun, Chengdu Shuangliu, Xianyang, Chongqing Jianyebei

BofA GLOBAL RESEARCH

Exhibit 105: Selected Chinese airports vs Hong Kong 7-day avg. daily flights vs 2019

Flights in China have largely recovered to pre-COVID levels



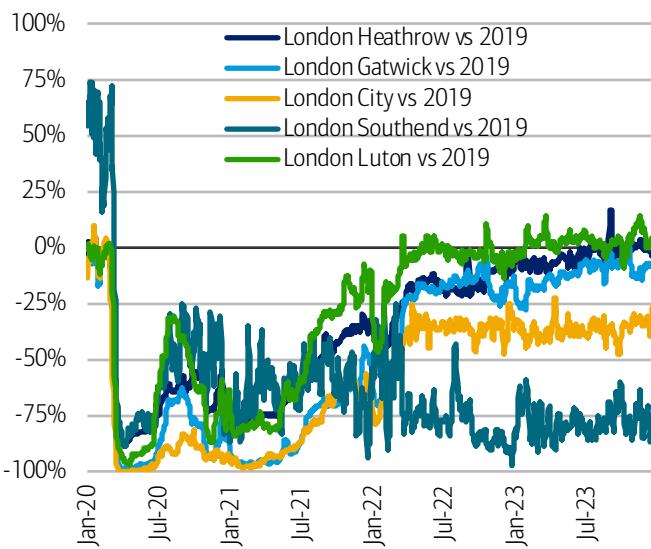
Source: BofA Global Research, Flightradar24

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Exhibit 106: London airports 7-day avg. daily flights vs 2019

London South end currently has the lowest level of flight activity compared to 2019

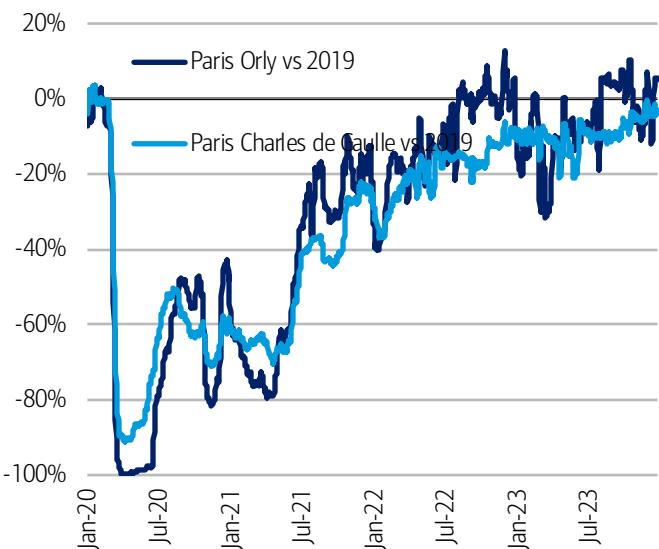


Source: BofA Global Research, Flightradar24

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Exhibit 107: Paris airports 7-day avg. daily flights YoY %

Paris Orly cycles were stronger than CDG compared to 2019 throughout the market recovery

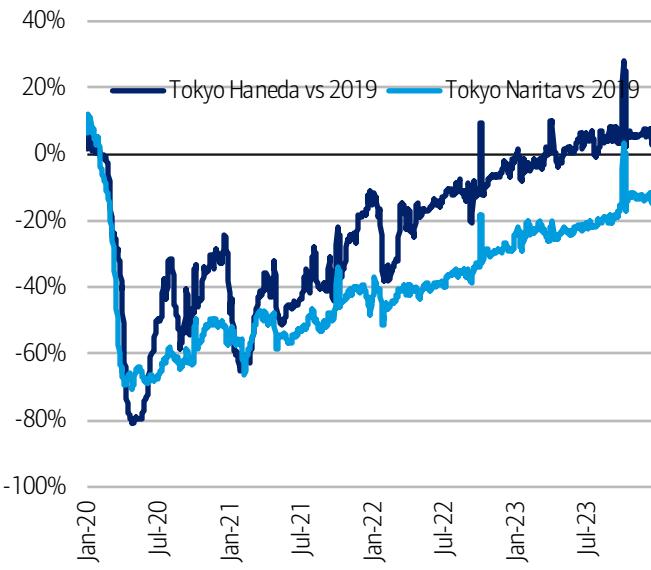


Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 108: Japan airports 7-day avg. daily flights YoY %

Haneda cycles have been more resilient than Narita since January 2021

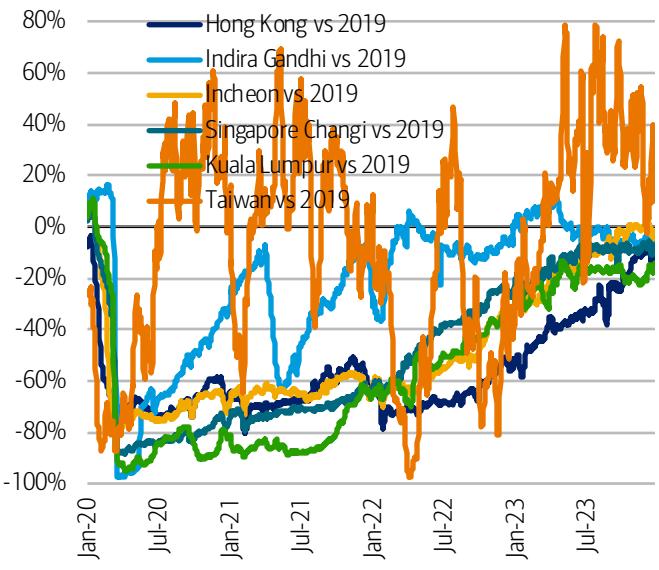


Source: BofA Global Research, Flightradar24

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Exhibit 109: APAC ex China 7-day avg. daily flights vs 2019

Most of Asia airports now are on the way to recovery



Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Global airport pairs cycles

Exhibit 110: London Heathrow to New York JFK 7-day avg. daily flights YoY %

LHR-JFK is a major business travel route and key revenue generator for legacy carriers

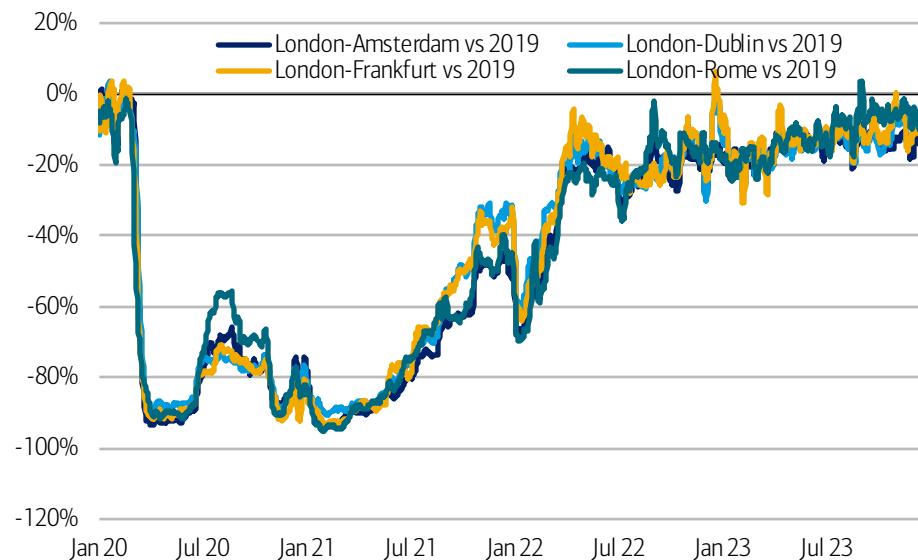


Source: BofA Global Research, FlightRadar24

BofA GLOBAL RESEARCH

Exhibit 111: London key short-haul routes 7-day avg. daily flights vs 2019

Most key London routes have almost fully recovered



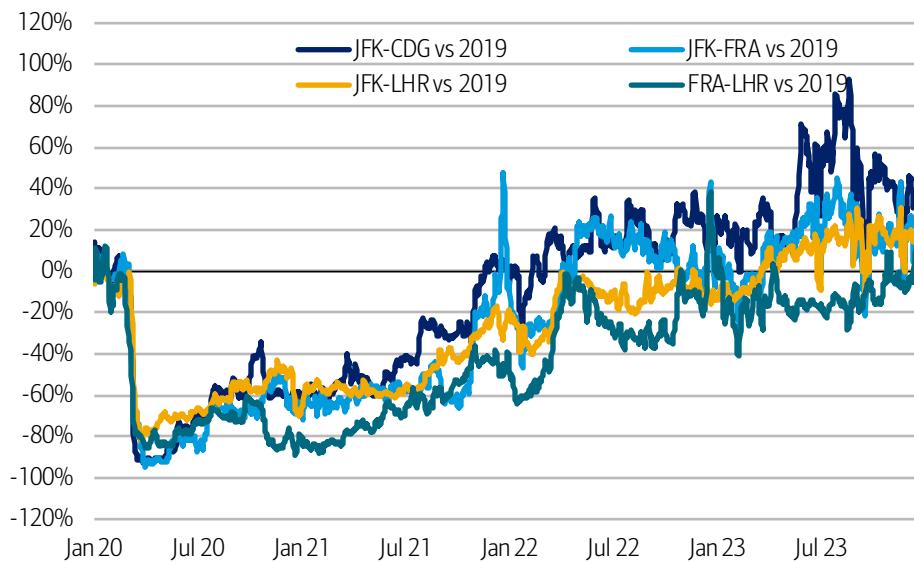
Source: BofA Global Research, Flightradar24 Note: London Airports include Heathrow, Gatwick, Stansted, Luton, City, Southend

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Exhibit 112: Europe Inter-national 7-day avg. daily flights vs 2019

JFK-FRA & JFK-CDG are already above 2019 levels



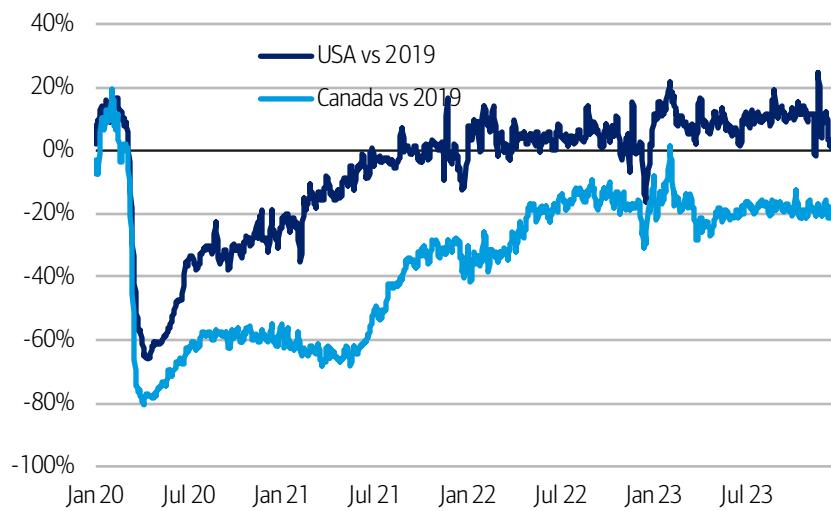
Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

North America key route pairs

Exhibit 113: USA and Canada 14-day avg. flights vs 2019

US domestic flights have supported total US flights

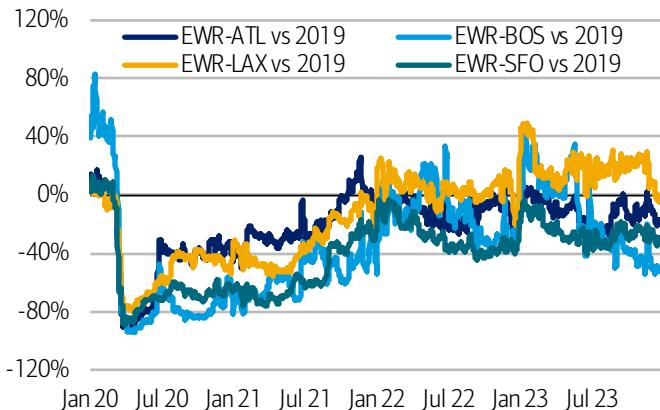


Source: BofA Global Research, Flightradar24

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Exhibit 114: Newark airport pairs 7-day avg. daily flights vs 2019

EWR-LAX has been the most resilient US pair

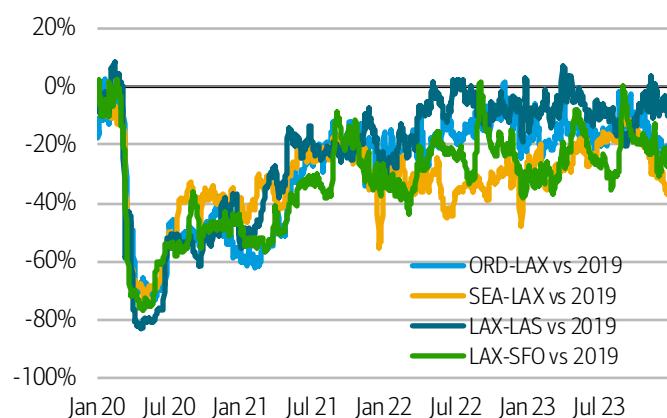
**Source:** BofA Global Research, Flightradar24

EWR = Newark, ATL = Atlanta, BOS = Boston, SFO = San Francisco

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Exhibit 115: Los Angeles airport pairs 7-day avg. daily flights vs 2019

LA airport pairs have been relatively volatile

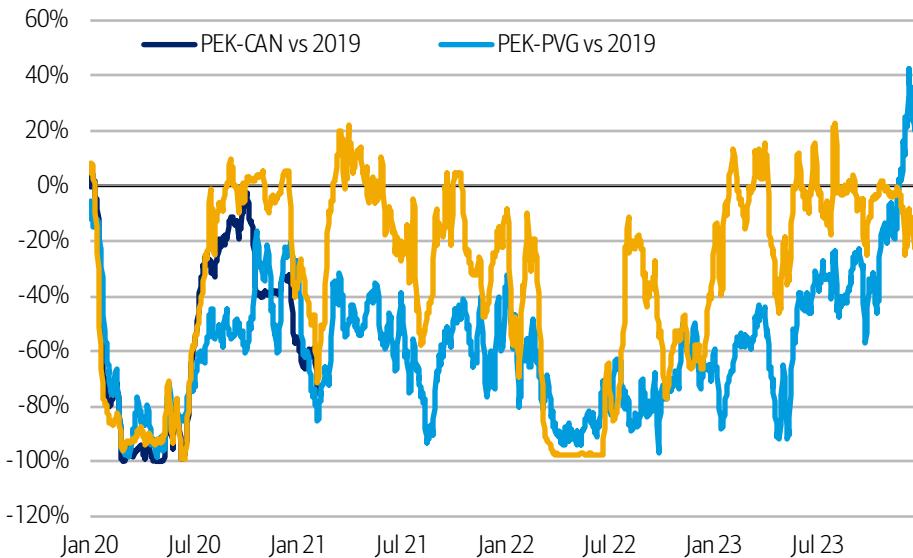
**Source:** BofA Global Research, Flightradar24

LAX = Los Angeles, ORD = Orlando, LAS = Las Vegas, SFO = San Francisco

BofA GLOBAL RESEARCH

Asia-Pacific key route pairs**Exhibit 116: Beijing airport pairs 7-day avg. daily flights vs 2019**

Internal Chinese flights have been volatile due to Zero Covid policies

**Source:** BofA Global Research, Flightradar24

PEK = Beijing, CAN = Guangzhou, PVG = Shanghai Pudong, Shanghai Hongqiao

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Exhibit 117: Delhi-Bombay 7-day avg. daily flights YoY %

Delhi-Bombay is still below 2019 levels

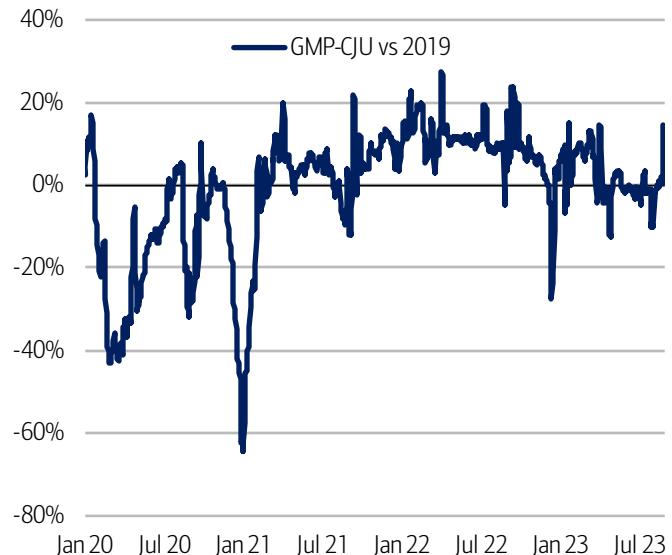


Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 118: Gimpo Seoul to Jeju 7-day avg. daily flights YoY %

Seoul to Jeju Island has been consistently above 2019 levels YTD

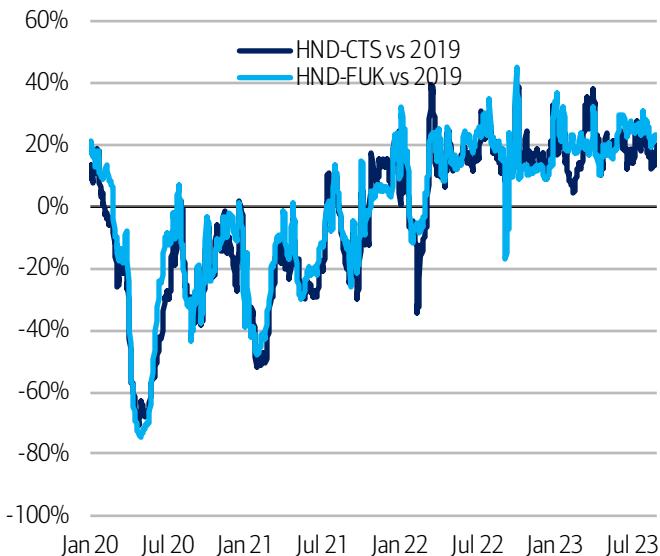


Source: BofA Global Research, Flightradar24 GMP = Gimpo Airport Seoul CJU = Jeju International Airport

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Exhibit 119: Tokyo Haneda airport pairs 7-day avg. daily flights YoY %

Haneda to Chitose and Haneda to Fukuoka are already above 2019 levels



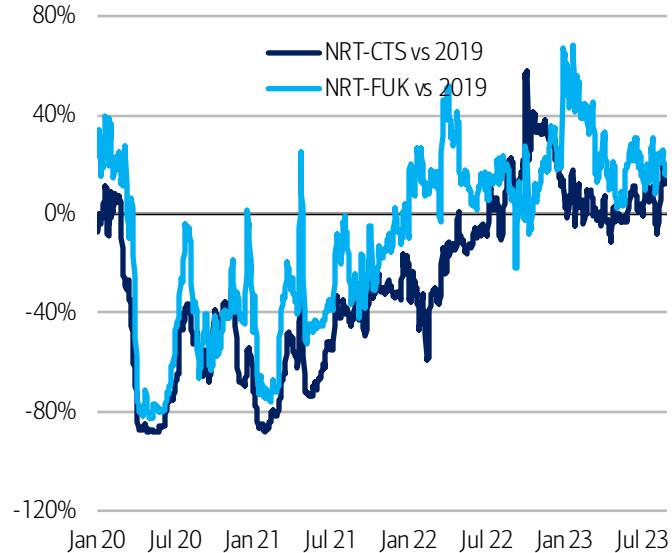
Source: BofA Global Research, Flightradar24

Note: CTS = New Chitose Airport FUK = Fukuoka Airport

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Exhibit 120: Narita airport pairs 7-day avg. daily flights YoY %

Narita main routes are already above 2019 levels



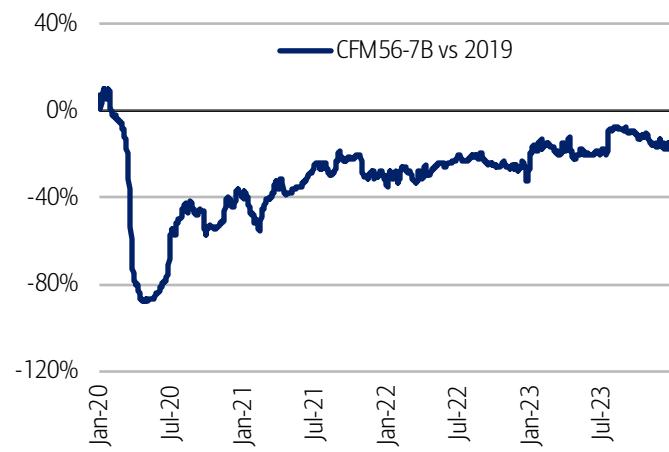
Source: BofA Global Research, Flightradar24 Note: CTS = New Chitose Airport FUK = Fukuoka Airport

BofA GLOBAL RESEARCH

Engine Flight Hours

Exhibit 121: Engine Flight Hours 7-day avg. vs 2019% – CFM56-7B

CFM56-7B engine hours have seen a steady recovery

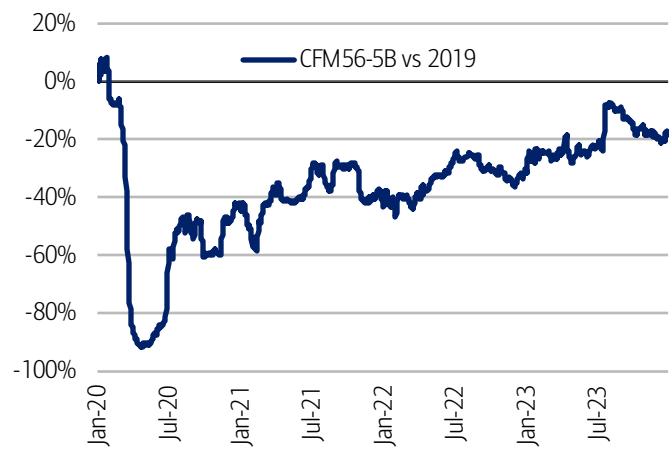


Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 122: Engine Flight Hours 7-day avg. vs 2019% – CFM56-5B

CFM56-5B engine hours have seen a steady recovery

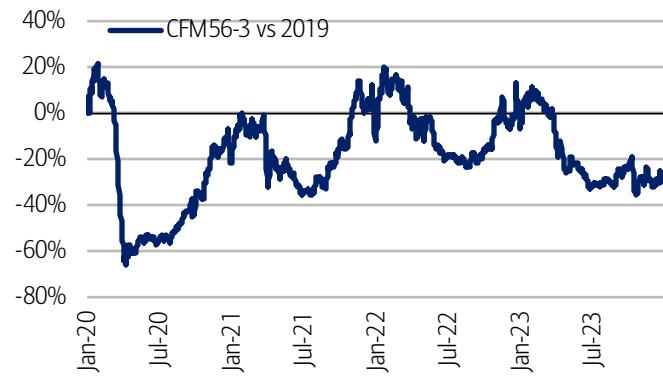


Source: BofA Global Research, Flightradar24

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Exhibit 123: Engine Flight Hours 7-day avg. vs 2019% – CFM56-3

CFM56-3 engine hours have been weak recently

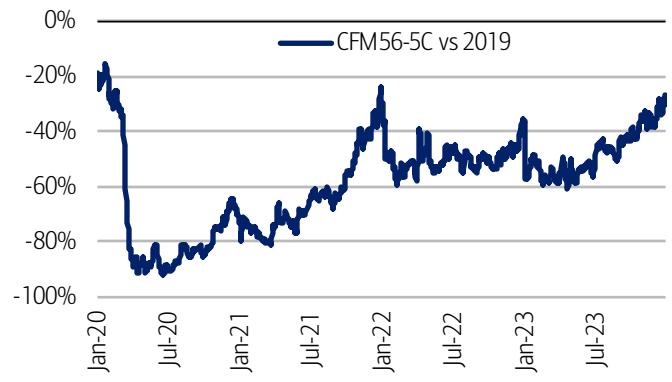


Source: BofA Global Research, Flightradar24

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Exhibit 124: Engine Flight Hours 7-day avg. vs 2019% – CFM56-5C

CFM56-5C engine hours have plateaued in recent months



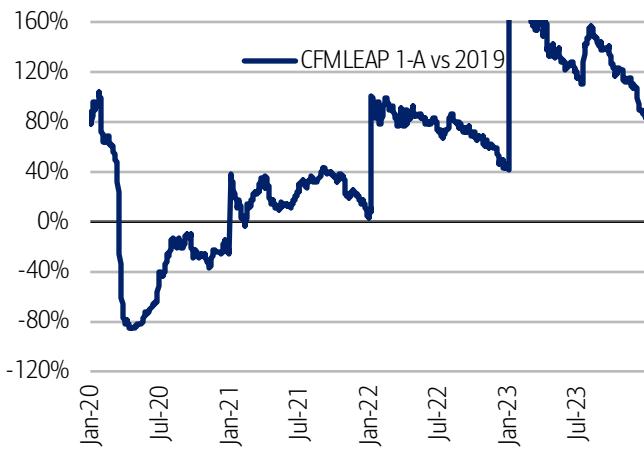
Source: BofA Global Research, Flightradar24

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Exhibit 125: Engine Flight Hours 7-day avg. vs 2019% – CFMLEAP 1-A

CFMLEAP 1-A engine hours have been significantly above 2019 levels since January 2022

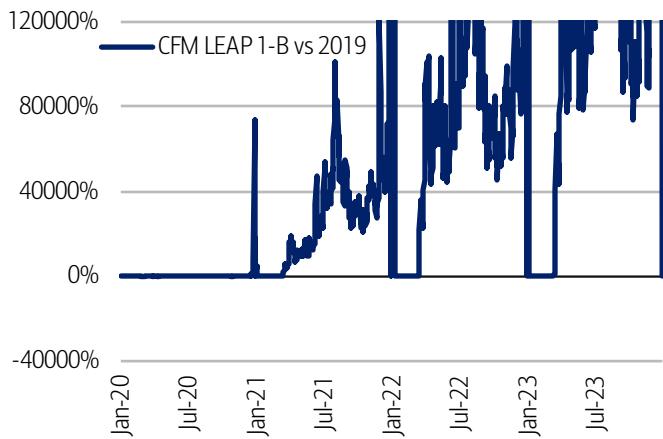


Source: BofA Global Research, Flightradar24

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Exhibit 126: Engine Flight Hours 7-day avg. vs 2019% – CFMLEAP 1-B

CFMLEAP 1-B engine hours growth has been extremely volatile driven by the recovery of the 737MAX

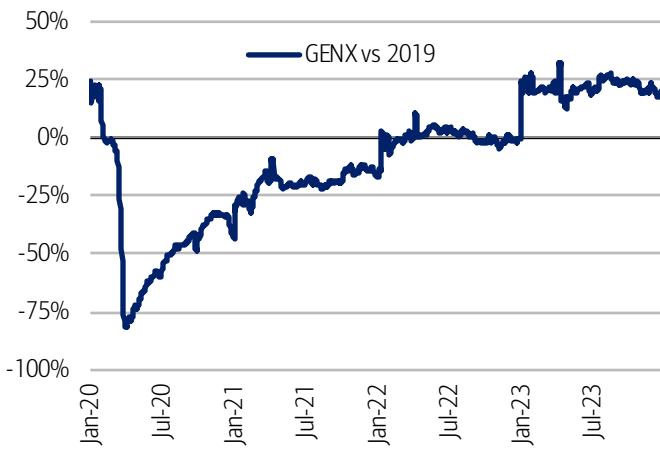


Source: BofA Global Research, Flightradar24

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Exhibit 127: Engine Flight Hours 7-day avg. vs 2019% – GENX

GENX engine hours continued to recover in FY23

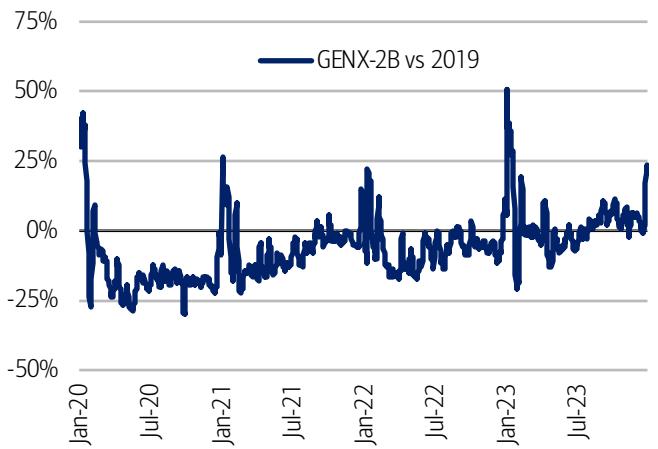


Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 128: Engine Flight Hours 7-day avg. vs 2019% – GENX-2B

GENX-2B engine hours steadily improved in 2023

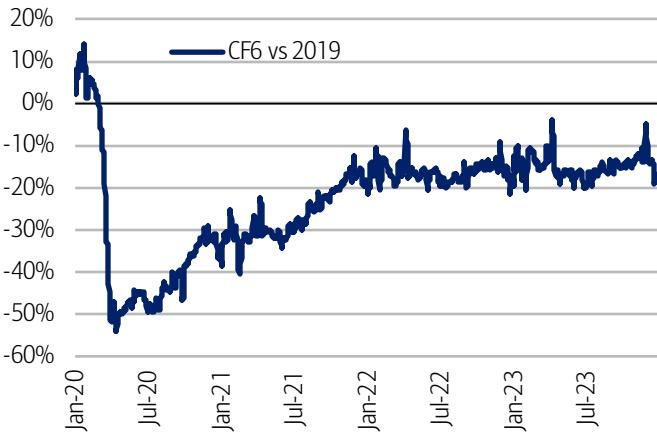


Source: BofA Global Research, Flightradar24

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Exhibit 129: Engine Flight Hours 7-day avg. vs 2019% – CF6

CF6 engine hours have plateaued since 2022

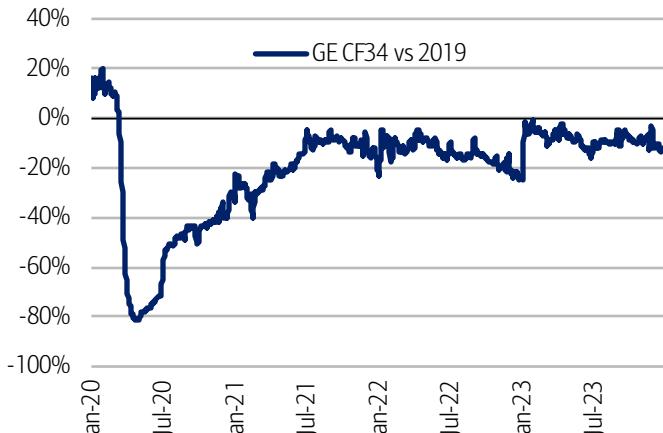


Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 130: Engine Flight Hours 7-day avg. vs 2019% – GE CF34

GE CF34 engine hours gradually recovered through 2023

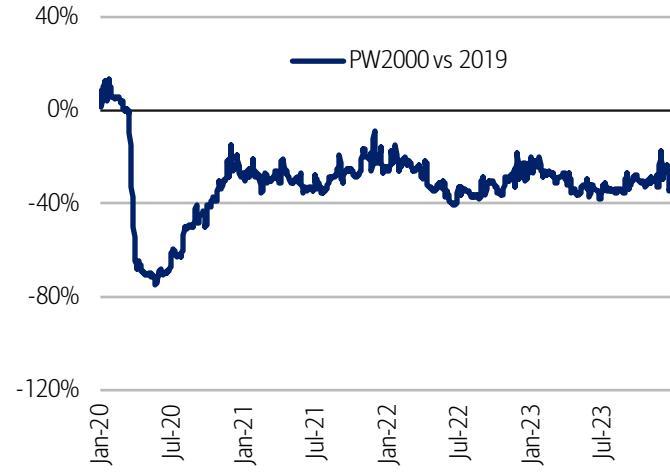


Source: BofA Global Research, Flightradar24

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Exhibit 131: Engine Flight Hours 7-day avg. vs 2019% – PW2000

PW2000 engine hours remained weak through 2023

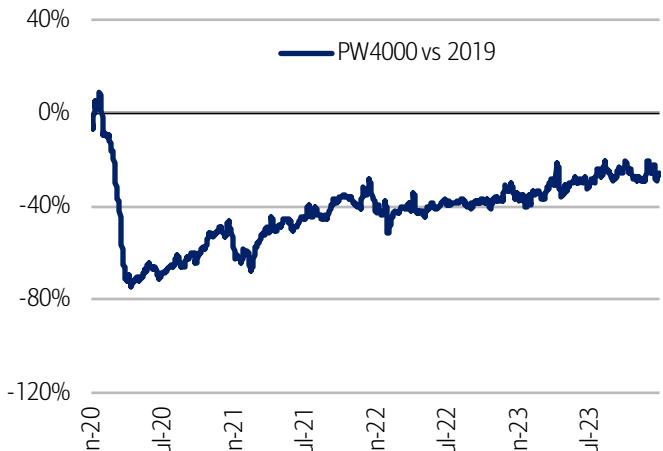


Source: BofA Global Research, Flightradar24

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Exhibit 132: Engine Flight Hours 7-day avg. vs 2019% – PW4000

PW4000 engine hours have gradually recovered but are still well below pre-COVID levels



Source: BofA Global Research, Flightradar24

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Exhibit 133: Engine Flight Hours 7-day avg. vs 2019% – PW1100G

PW1100G engine hours growth is ahead of 2019 levels because of growth in the installed fleet



Source: BofA Global Research, Flightradar24

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Exhibit 134: Engine Flight Hours 7-day avg. vs 2019% – PW1500G

PW1500G engine hours decreased through 2023 as a result of durability issues



Source: BofA Global Research, Flightradar24

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Exhibit 135: Engine Flight Hours 7-day avg. vs 2019% – PW1900G

PW1900G engine hours have grown with the installed fleet

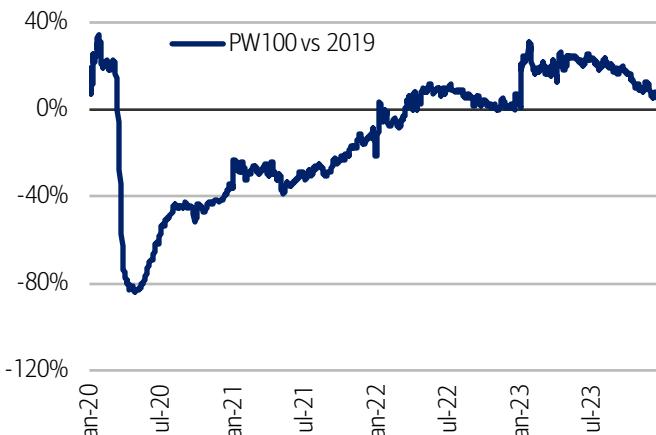


Source: BofA Global Research, Flightradar24

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Exhibit 136: Engine Flight Hours 7-day avg. vs 2019% – PW100

PW100 engine hours are ahead of 2019 levels

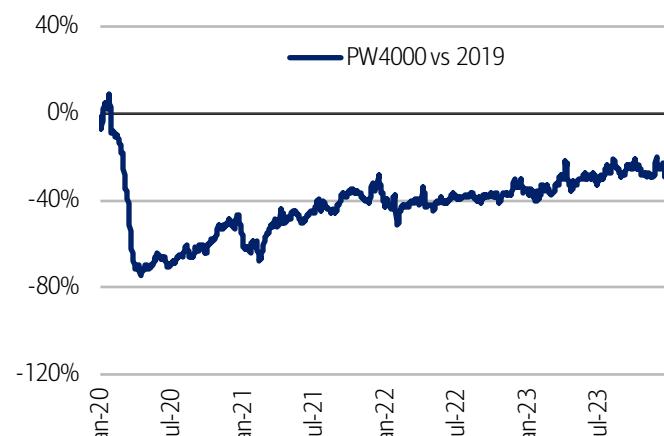


Source: BofA Global Research, Flightradar24

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Exhibit 137: Engine Flight Hours 7-day avg. vs 2019% – PW4000

PW4000 engine hours have gradually improved but are below pre-COVID levels

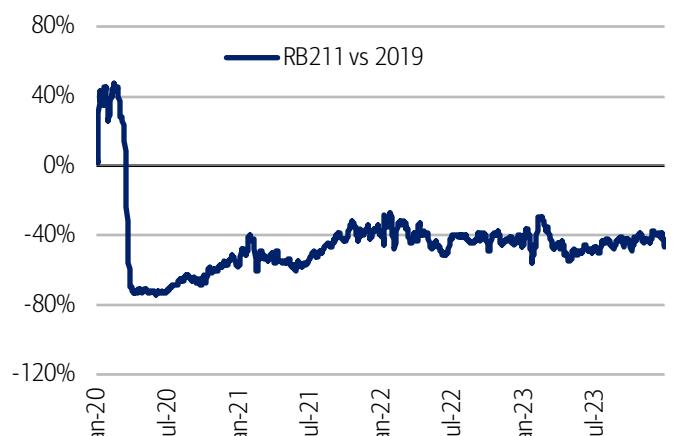


Source: BofA Global Research, Flightradar24

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Exhibit 138: Engine Flight Hours 7-day avg. vs 2019% – RB211

RB211 engine hours gradually improved from its lows in Apr-2020 but still remain very weak vs 2019 levels

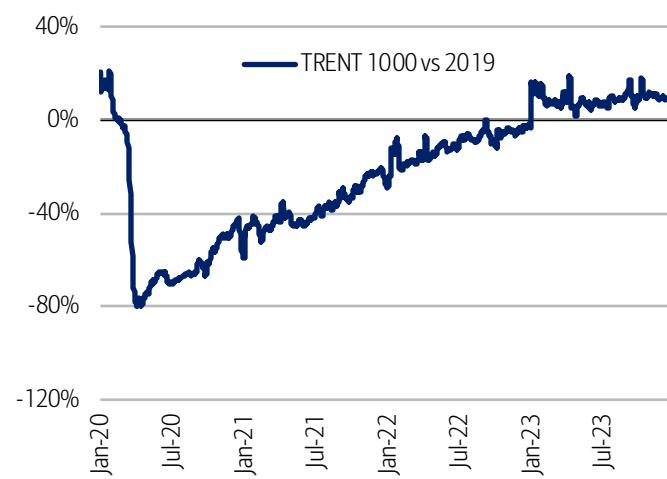


Source: BofA Global Research, Flightradar24

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Exhibit 139: Engine Flight Hours 7-day avg. vs 2019% – TREN 1000

Trent 1000 engine hours are slightly ahead 2019 levels

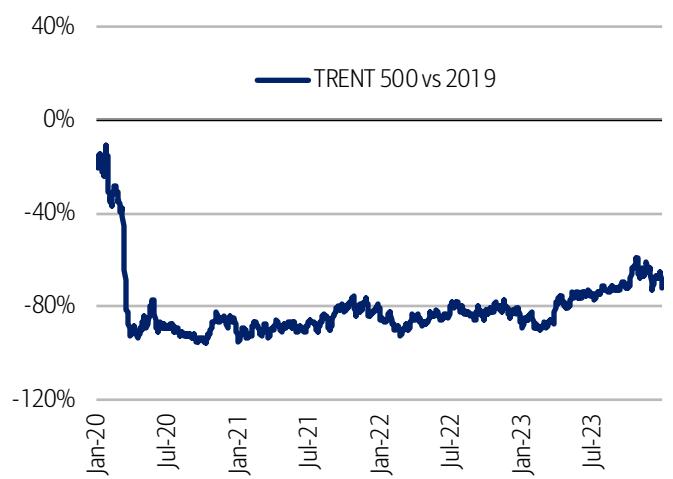


Source: BofA Global Research, Flightradar24

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Exhibit 140: Engine Flight Hours 7-day avg. vs 2019% – TREN 500

Trent 500 engine hours growth remained broadly in range through 2022-23



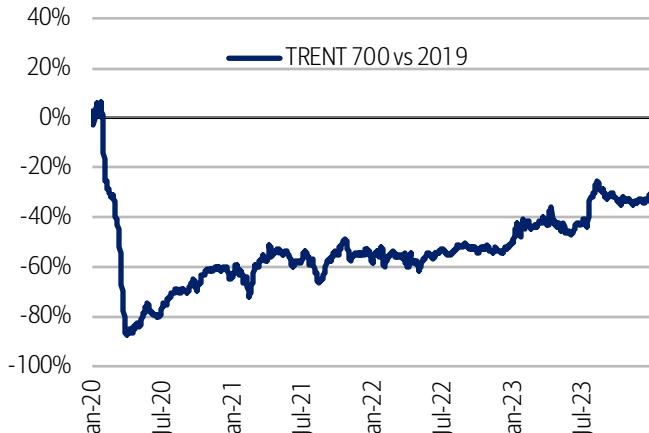
Source: BofA Global Research, Flightradar24

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Exhibit 141: Engine Flight Hours 7-day avg. vs 2019% – TRENt 700

Trent 700 engine hours have started to recover through 2023

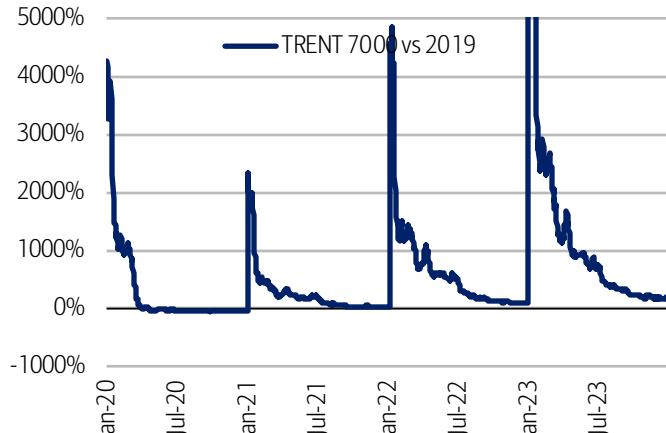


Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 142: Engine Flight Hours 7-day avg. vs 2019% – TRENt 7000

Trent 7000 engine hours remain above 2019 levels in 2023

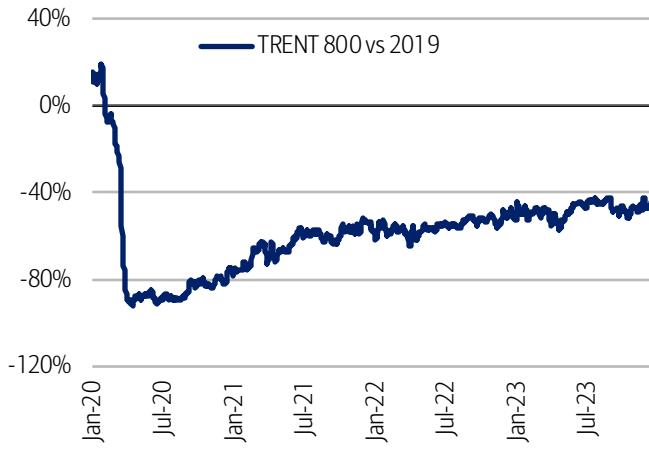


Source: BofA Global Research, Flightradar24

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Exhibit 143: Engine Flight Hours 7-day avg. vs 2019% – TRENt 800

Trent 800 engine hours have plateaued in recent months

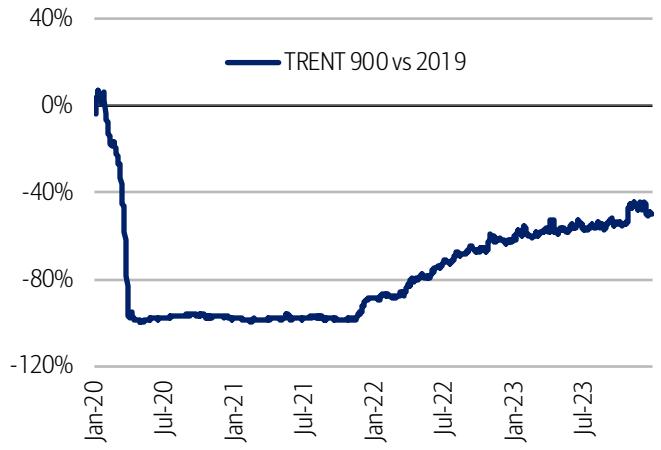


Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 144: Engine Flight Hours 7-day avg. vs 2019% – TRENt 900

Trent 900 engine hours progressively improved in 2022-23

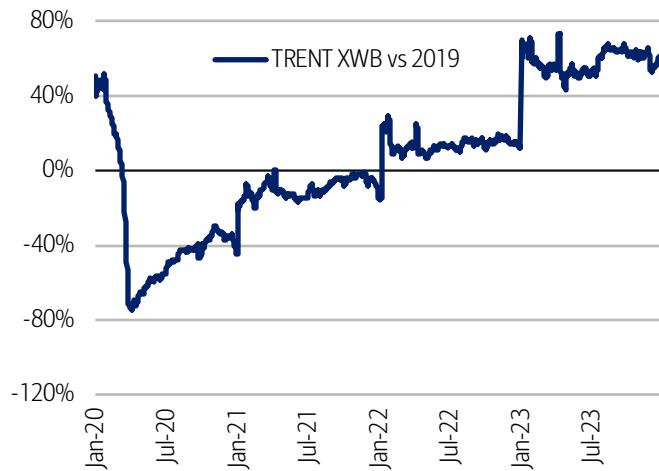


Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 145: Engine Flight Hours 7-day avg. vs 2019% – TRENXWB

Trent XWB engine hours have been above 2019 levels since January 2022

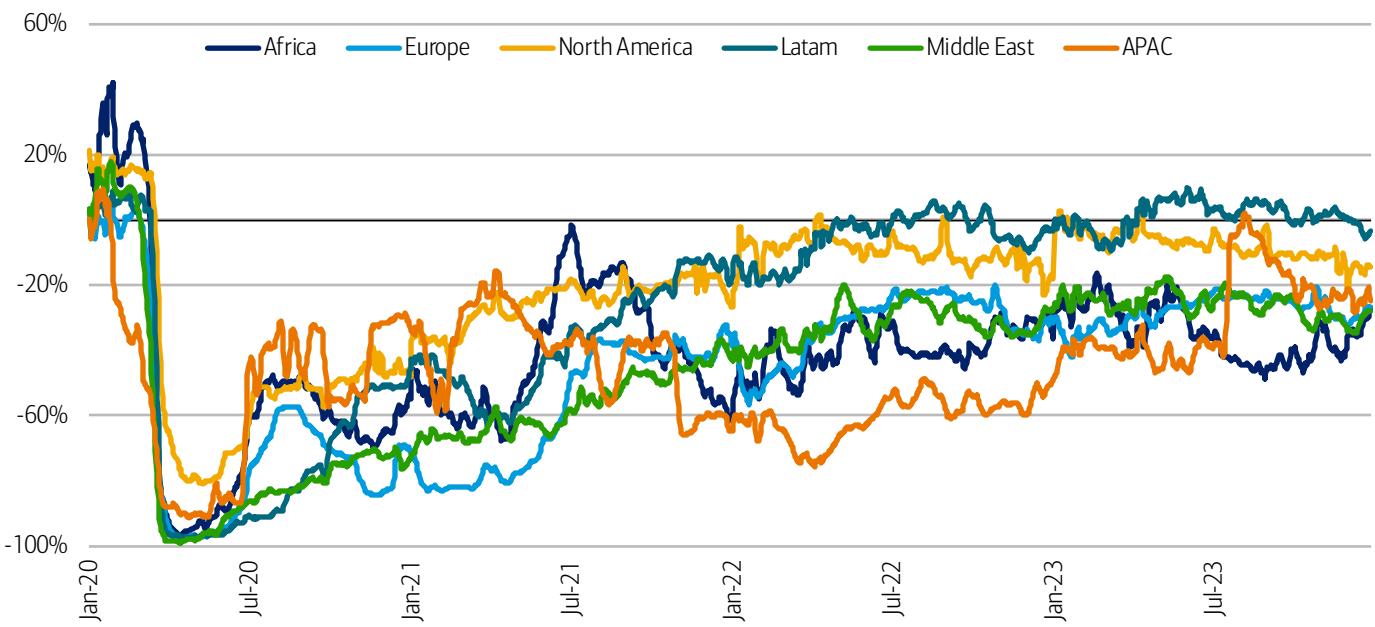
**Source:** BofA Global Research, Flightradar24

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Engine flight hours – regionally

Exhibit 146: CFM56-5B regional Engine Flight Hours 7-day avg. vs 2019%

APAC saw a strong recovery YTD for CFM56-5B engines

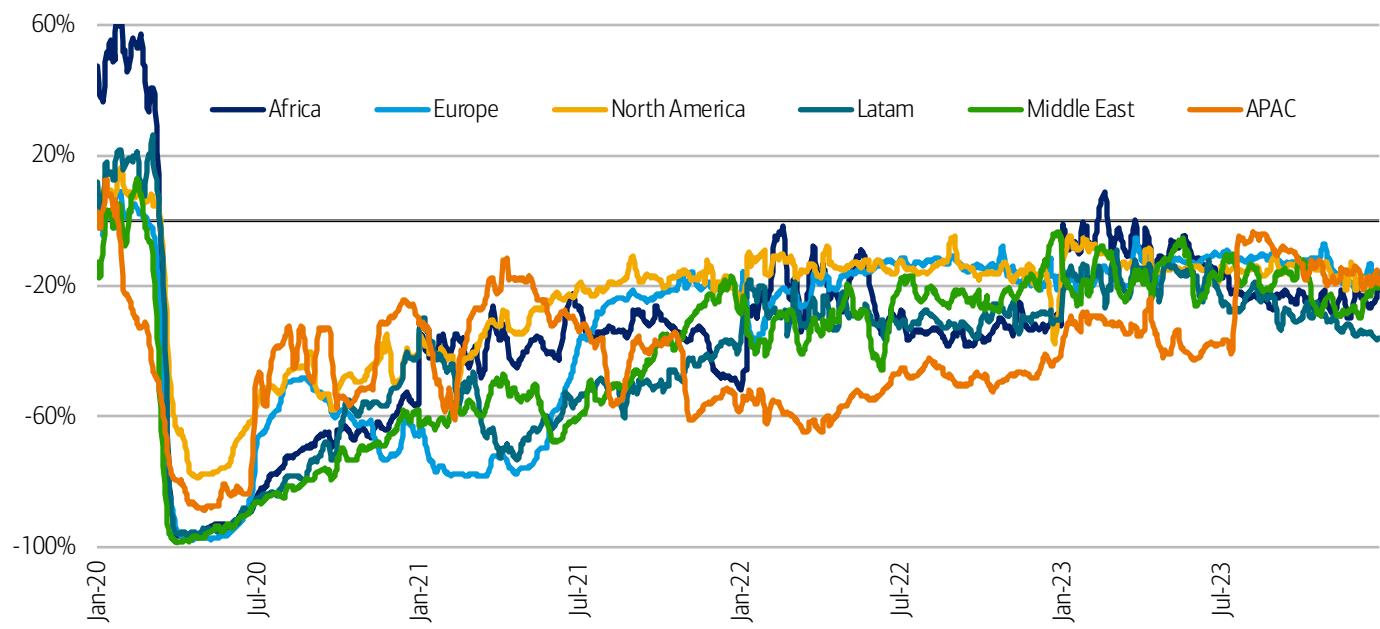


Source: BofA Global Research, Flightradar24

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Exhibit 147: CFM56-7B regional Engine Flight Hours 7-day avg. vs 2019%

CFM56-7B engine flight hours have broadly recovered for many regions

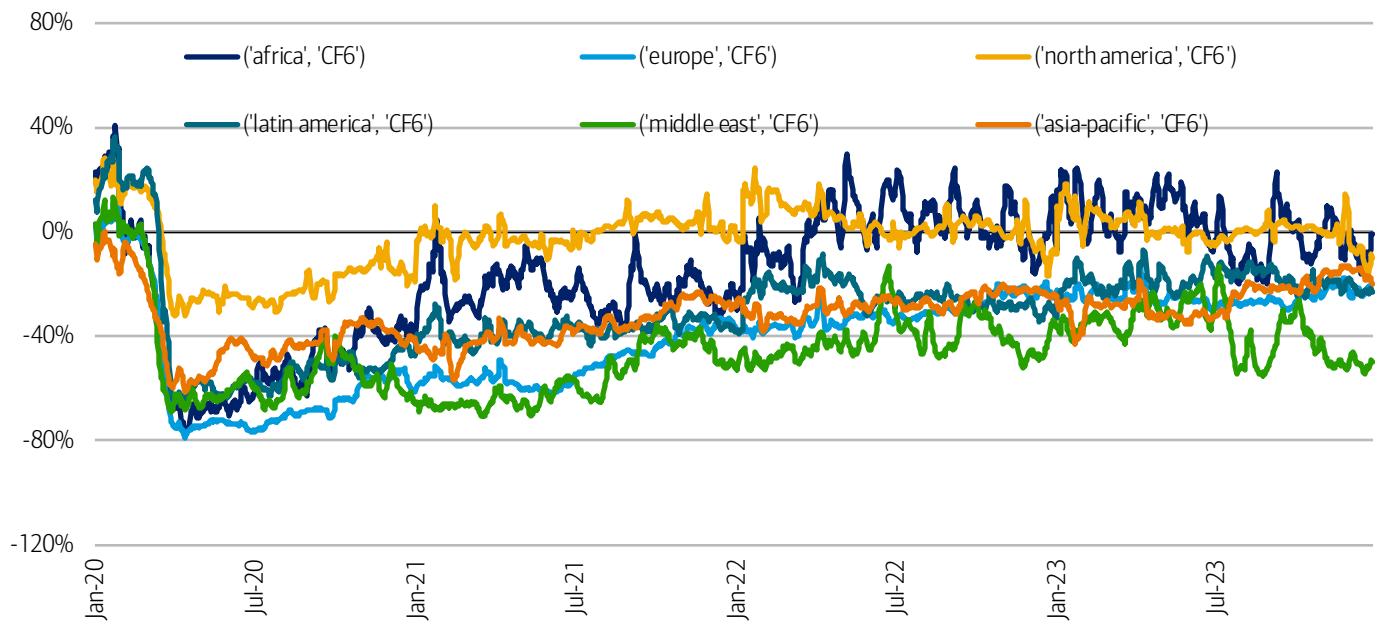


Source: BofA Global Research, Flightradar24

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Exhibit 148: CF6 regional Engine Flight Hours 7-day avg. vs 2019%

CF6 engine flight hours are back at pre COVID levels for North America



Source: BofA Global Research, Flightradar24

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Monthly flight cycles data tables

Exhibit 149: Major engine families monthly average flight cycles yoy growth

Most major engine cycles tracked in our data remained below vs 2019 in December 2023

	CFM56 -5B (A320ceo)	CFM56 -7B (737NG)	CFM56 family	V2500	CFMLEAP	GTF family	Rolls-Royce commercial	P&W	GE	Total
Jan-20	6%	3%	4%	2%	7%	93%	19%	13%	10%	8%
Feb-20	-11%	-12%	-12%	-6%	-12%	68%	-8%	5%	3%	-5%
Mar-20	-40%	-35%	-37%	-37%	-17%	15%	-39%	-26%	-21%	-32%
Apr-20	-85%	-79%	-81%	-90%	-76%	-72%	-77%	-82%	-64%	-80%
May-20	-84%	-79%	-81%	-90%	-69%	-66%	-71%	-81%	-62%	-79%
Jun-20	-77%	-72%	-74%	-81%	-56%	-41%	-71%	-71%	-59%	-72%
Jul-20	-57%	-52%	-54%	-63%	-28%	-19%	-64%	-55%	-49%	-56%
Aug-20	-50%	-43%	-46%	-63%	-13%	-12%	-60%	-52%	-45%	-49%
Sep-20	-52%	-46%	-49%	-66%	-12%	-7%	-57%	-52%	-42%	-49%
Oct-20	-54%	-47%	-50%	-63%	-13%	-7%	-51%	-49%	-38%	-49%
Nov-20	-53%	-43%	-47%	-63%	-17%	-4%	-48%	-47%	-35%	-46%
Dec-20	-49%	-41%	-44%	-59%	-16%	0%	-47%	-42%	-31%	-43%
Vs 2019										
Jan '21 vs '19	-51%	-47%	-48%	-64%	-24%	79%	-44%	-41%	-28%	-44%
Feb '21 vs '19	-57%	-53%	-54%	-66%	-32%	62%	-51%	-44%	-33%	-49%
Mar '21 vs '19	-46%	-40%	-42%	-60%	14%	71%	-42%	-38%	-28%	-40%
Apr '21 vs '19	-46%	-38%	-41%	-56%	45%	63%	-38%	-36%	-26%	-38%
May '21 vs '19	-48%	-40%	-43%	-57%	38%	30%	-41%	-42%	-27%	-40%
Jun '21 vs '19	-46%	-35%	-40%	-55%	54%	29%	-43%	-40%	-25%	-37%
Jul '21 vs '19	-38%	-29%	-33%	-48%	77%	46%	-38%	-34%	-20%	-30%
Aug '21 vs '19	-43%	-35%	-38%	-49%	83%	47%	-46%	-33%	-21%	-33%
Sep '21 vs '19	-37%	-28%	-32%	-48%	91%	54%	-39%	-29%	-18%	-28%
Oct '21 vs '19	-36%	-27%	-31%	-46%	93%	54%	-35%	-26%	-18%	-26%
Nov '21 vs '19	-42%	-31%	-35%	-45%	87%	54%	-37%	-23%	-16%	-28%
Dec '21 vs '19	-39%	-29%	-32%	-41%	83%	61%	-34%	-19%	-15%	-25%
Jan '22 vs '19	-38%	-30%	-33%	-43%	72%	172%	-28%	-16%	-14%	-24%
Feb '22 vs '19	-38%	-29%	-32%	-45%	73%	159%	-34%	-17%	-15%	-25%
Mar '22 vs '19	-42%	-33%	-36%	-41%	123%	157%	-32%	-14%	-13%	-26%
Apr '22 vs '19	-41%	-33%	-36%	-33%	177%	152%	-35%	-9%	-13%	-24%
May '22 vs '19	-36%	-29%	-32%	-30%	191%	144%	-34%	-7%	-13%	-21%
Jun '22 vs '19	-33%	-26%	-29%	-31%	192%	132%	-32%	-8%	-13%	-20%
Jul '22 vs '19	-28%	-23%	-26%	-31%	195%	125%	-29%	-8%	-14%	-18%
Aug '22 vs '19	-28%	-23%	-25%	-31%	208%	119%	-29%	-7%	-15%	-17%
Sep '22 vs '19	-33%	-26%	-29%	-32%	195%	104%	-29%	-8%	-13%	-19%
Oct '22 vs '19	-34%	-28%	-30%	-30%	190%	94%	-31%	-8%	-15%	-20%
Nov '22 vs '19	-37%	-29%	-32%	-28%	179%	87%	-29%	-6%	-14%	-20%
Dec '22 vs '19	-34%	-28%	-31%	-28%	170%	86%	-28%	-5%	-16%	-20%
Jan '23 vs '19	-24%	-18%	-21%	-26%	183%	266%	-8%	9%	-5%	-8%
Feb '23 vs '19	-23%	-17%	-20%	-27%	170%	250%	-6%	6%	-2%	-8%
Mar '23 vs '19	-24%	-17%	-20%	-27%	262%	228%	-4%	6%	-2%	-8%
Apr '23 vs '19	-22%	-16%	-19%	-26%	354%	205%	-3%	5%	-4%	-7%
May '23 vs '19	-22%	-16%	-19%	-26%	350%	184%	-5%	5%	-4%	-7%
Jun '23 vs '19	-22%	-17%	-19%	-28%	347%	168%	-4%	2%	-5%	-8%
Jul '23 vs '19	-19%	-14%	-17%	-27%	353%	163%	-3%	2%	-6%	-6%
Aug '23 vs '19	-16%	-11%	-14%	-26%	376%	162%	-2%	4%	-5%	-3%
Sep '23 vs '19	-18%	-12%	-15%	-26%	352%	145%	-4%	4%	-3%	-4%
Oct '23 vs '19	-20%	-12%	-16%	-25%	341%	128%	-2%	2%	-4%	-4%
Nov '23 vs '19	-21%	-15%	-18%	-25%	315%	114%	-4%	2%	-3%	-5%
Dec '23 vs '19	-22%	-15%	-18%	-25%	294%	106%	-3%	0%	-6%	-6%

Source: BofA Global Research, Flightradar24

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Exhibit 150: P&W engine monthly average flight cycles yoy growth

PW1900G has been the best P&W engine through December 2023

	GP7200	V2500	PW100	PW1100G	PW1500G	PW1900G	PW2000	PW4000	JT8D	JT9D	Total P&W
Jan '20	9%	2%	19%	94%	67%	379%	4%	3%	-45%	38%	13%
Feb '20	1%	-6%	17%	65%	62%	411%	4%	-15%	-47%	-79%	5%
Mar '20	-39%	-37%	-15%	16%	-6%	228%	-12%	-44%	-58%	-69%	-26%
Apr '20	-99%	-90%	-80%	-72%	-71%	-39%	-52%	-64%	-81%	-69%	-82%
May '20	-100%	-90%	-80%	-67%	-68%	52%	-57%	-61%	-77%	-56%	-81%
Jun '20	-100%	-81%	-67%	-42%	-44%	64%	-51%	-61%	-86%	-92%	-71%
Jul '20	-99%	-63%	-54%	-21%	-19%	120%	-43%	-55%	-85%	-94%	-55%
Aug '20	-96%	-63%	-49%	-13%	-18%	79%	-36%	-51%	-81%	-92%	-52%
Sep '20	-96%	-66%	-50%	-4%	-26%	75%	-26%	-51%	-73%	-52%	-52%
Oct '20	-96%	-63%	-49%	-2%	-41%	80%	-27%	-45%	-69%	0%	-49%
Nov '20	-94%	-63%	-46%	2%	-41%	24%	-22%	-43%	-58%	-83%	-47%
Dec '20	-92%	-59%	-43%	8%	-41%	-2%	-13%	-39%	-48%	-93%	-42%
Vs 2019											
Jan '21 vs '19	-92%	-64%	-34%	95%	-12%	321%	-21%	-54%	-73%	167%	-41%
Feb '21 vs '19	-96%	-66%	-36%	74%	-17%	271%	-21%	-57%	-71%	-39%	-44%
Mar '21 vs '19	-94%	-60%	-35%	85%	-14%	293%	-16%	-46%	-73%	-7%	-38%
Apr '21 vs '19	-91%	-56%	-37%	76%	-11%	240%	-15%	-42%	-77%	42%	-36%
May '21 vs '19	-88%	-57%	-44%	33%	-5%	322%	-21%	-41%	-78%	119%	-42%
Jun '21 vs '19	-89%	-55%	-40%	28%	10%	276%	-17%	-43%	-75%	-40%	-40%
Jul '21 vs '19	-85%	-48%	-40%	44%	29%	471%	-19%	-41%	-77%	-71%	-34%
Aug '21 vs '19	-84%	-49%	-38%	42%	40%	368%	-19%	-49%	-73%	-71%	-33%
Sep '21 vs '19	-83%	-48%	-34%	52%	38%	354%	-11%	-42%	-65%	-87%	-29%
Oct '21 vs '19	-77%	-46%	-31%	52%	37%	337%	-18%	-39%	-59%	-77%	-26%
Nov '21 vs '19	-65%	-45%	-25%	51%	48%	217%	-11%	-44%	-58%	-31%	-23%
Dec '21 vs '19	-63%	-41%	-22%	61%	46%	140%	-12%	-36%	-55%	-63%	-19%
Jan '22 vs '19	-61%	-43%	-13%	171%	136%	824%	-15%	-46%	-77%	-29%	-16%
Feb '22 vs '19	-59%	-45%	-16%	157%	120%	836%	-12%	-48%	-76%	-83%	-17%
Mar '22 vs '19	-56%	-41%	-11%	156%	119%	865%	-11%	-47%	-76%	-78%	-14%
Apr '22 vs '19	-51%	-33%	-9%	147%	125%	839%	-22%	-49%	-77%	-56%	-9%
May '22 vs '19	-48%	-30%	-7%	140%	114%	849%	-24%	-50%	-77%	-37%	-7%
Jun '22 vs '19	-54%	-31%	-7%	128%	110%	632%	-18%	-47%	-77%	-79%	-8%
Jul '22 vs '19	-51%	-31%	-6%	120%	104%	770%	-15%	-47%	-80%	-78%	-8%
Aug '22 vs '19	-52%	-31%	-6%	114%	101%	531%	-16%	-45%	-75%	-90%	-7%
Sep '22 vs '19	-48%	-32%	-7%	97%	91%	550%	-13%	-45%	-67%	-65%	-8%
Oct '22 vs '19	-43%	-30%	-9%	87%	88%	515%	-26%	-45%	-64%	-62%	-8%
Nov '22 vs '19	-36%	-28%	-8%	78%	102%	309%	-11%	-43%	-63%	-86%	-6%
Dec '22 vs '19	-38%	-28%	-7%	81%	90%	232%	-14%	-38%	-60%	-96%	-5%
Jan '23 vs '19	-31%	-26%	9%	261%	218%	1340%	-10%	-37%	-80%	-95%	9%
Feb '23 vs '19	-28%	-27%	5%	238%	226%	1411%	-10%	-34%	-76%	-100%	6%
Mar '23 vs '19	-30%	-27%	7%	217%	204%	1477%	-11%	-31%	-78%	-100%	6%
Apr '23 vs '19	-24%	-26%	5%	193%	192%	1182%	-23%	-27%	-80%	-100%	5%
May '23 vs '19	-18%	-26%	7%	170%	179%	1227%	-23%	-27%	-79%	-96%	5%
Jun '23 vs '19	-24%	-28%	5%	152%	175%	1031%	-19%	-29%	-77%	-100%	2%
Jul '23 vs '19	-24%	-27%	4%	149%	157%	1237%	-23%	-28%	-79%	-99%	2%
Aug '23 vs '19	-23%	-26%	4%	149%	159%	922%	-22%	-28%	-77%	-100%	4%
Sep '23 vs '19	-20%	-26%	3%	130%	144%	925%	-16%	-29%	-69%	-94%	4%
Oct '23 vs '19	-19%	-25%	-1%	111%	143%	892%	-22%	-27%	-69%	-51%	2%
Nov '23 vs '19	-17%	-25%	-1%	98%	140%	563%	-14%	-29%	-70%	17%	2%
Dec '23 vs '19	-25%	-25%	-4%	91%	137%	421%	-17%	-27%	-63%	15%	0%

Source: BofA Global Research, Flightradar24

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Exhibit 151: GE engine monthly average flight cycles yoy growth

Genx-1B exhibited was the most resilient cycle in December 2023

	CF34	CF6	GE90	Genx-1B	GEnx-2B	Total GE
Jan-20	12%	9%	2%	20%	24%	10%
Feb-20	7%	6%	-6%	-4%	-2%	3%
Mar-20	-21%	-13%	-30%	-29%	-3%	-21%
Apr-20	-78%	-36%	-61%	-74%	-12%	-64%
May-20	-79%	-36%	-51%	-64%	-12%	-62%
Jun-20	-73%	-34%	-53%	-59%	-9%	-59%
Jul-20	-56%	-36%	-51%	-49%	-12%	-49%
Aug-20	-51%	-34%	-48%	-42%	-13%	-45%
Sep-20	-49%	-29%	-42%	-37%	-12%	-42%
Oct-20	-45%	-27%	-38%	-31%	-8%	-38%
Nov-20	-43%	-24%	-34%	-21%	-8%	-35%
Dec-20	-39%	-20%	-31%	-19%	-4%	-31%
Vs 2019						
Jan '21 vs '19	-31%	-22%	-36%	-14%	20%	-28%
Feb '21 vs '19	-40%	-24%	-36%	-19%	0%	-33%
Mar '21 vs '19	-34%	-19%	-34%	-5%	-4%	-28%
Apr '21 vs '19	-31%	-17%	-34%	-5%	-5%	-26%
May '21 vs '19	-31%	-23%	-33%	-12%	-3%	-27%
Jun '21 vs '19	-25%	-21%	-33%	-15%	-5%	-25%
Jul '21 vs '19	-19%	-20%	-30%	-10%	-3%	-20%
Aug '21 vs '19	-19%	-19%	-32%	-21%	-4%	-21%
Sep '21 vs '19	-17%	-15%	-28%	-17%	-1%	-18%
Oct '21 vs '19	-19%	-16%	-24%	-10%	3%	-18%
Nov '21 vs '19	-16%	-12%	-22%	-11%	0%	-16%
Dec '21 vs '19	-18%	-8%	-20%	-9%	4%	-15%
Jan '22 vs '19	-16%	-11%	-24%	1%	21%	-14%
Feb '22 vs '19	-18%	-10%	-24%	3%	5%	-15%
Mar '22 vs '19	-17%	-7%	-20%	5%	-8%	-13%
Apr '22 vs '19	-15%	-7%	-22%	-2%	-11%	-13%
May '22 vs '19	-13%	-12%	-18%	0%	-11%	-13%
Jun '22 vs '19	-16%	-10%	-18%	-1%	-6%	-13%
Jul '22 vs '19	-17%	-13%	-17%	0%	-11%	-14%
Aug '22 vs '19	-17%	-11%	-18%	-1%	-9%	-15%
Sep '22 vs '19	-15%	-9%	-17%	-5%	-10%	-13%
Oct '22 vs '19	-18%	-13%	-17%	-6%	-7%	-15%
Nov '22 vs '19	-17%	-10%	-16%	-6%	-11%	-14%
Dec '22 vs '19	-20%	-14%	-15%	-2%	-10%	-16%
Jan '23 vs '19	-4%	-11%	-13%	27%	12%	-5%
Feb '23 vs '19	-2%	-8%	-11%	29%	4%	-2%
Mar '23 vs '19	-4%	-7%	-9%	33%	0%	-2%
Apr '23 vs '19	-5%	-9%	-6%	26%	-5%	-4%
May '23 vs '19	-5%	-13%	-4%	26%	-5%	-4%
Jun '23 vs '19	-9%	-11%	-2%	31%	-1%	-5%
Jul '23 vs '19	-9%	-16%	-2%	29%	-4%	-6%
Aug '23 vs '19	-6%	-13%	-4%	27%	-5%	-5%
Sep '23 vs '19	-4%	-12%	-4%	23%	-4%	-3%
Oct '23 vs '19	-6%	-15%	-2%	25%	-2%	-4%
Nov '23 vs '19	-4%	-12%	-2%	22%	-5%	-3%
Dec '23 vs '19	-7%	-16%	-2%	19%	-3%	-6%

Source: BofA Global Research, Flightradar24

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Exhibit 152: Rolls Royce engine monthly average flight cycles yoy growth

Rolls Royce's newest commercial platforms (Trent 1000, Trent 7000 and Trent XWB) outperformed the broader portfolio in December 2023

	RB211	Trent 500	Trent 700	Trent 800	Trent 900	Trent 1000	Trent 7000	Trent XWB	Total Rolls-Royce commercial
Jan-20	37%	-20%	5%	15%	2%	25%	2622%	48%	19%
Feb-20	50%	-35%	-34%	0%	-14%	9%	1043%	20%	-8%
Mar-20	5%	-64%	-58%	-44%	-51%	-24%	423%	-23%	-39%
Apr-20	-60%	-87%	-83%	-89%	-97%	-72%	-14%	-68%	-77%
May-20	-61%	-75%	-76%	-86%	-97%	-64%	-33%	-56%	-71%
Jun-20	-62%	-86%	-77%	-88%	-98%	-65%	-48%	-52%	-71%
Jul-20	-56%	-85%	-68%	-89%	-97%	-61%	-55%	-42%	-64%
Aug-20	-52%	-88%	-61%	-90%	-97%	-59%	-53%	-40%	-60%
Sep-20	-53%	-90%	-57%	-85%	-96%	-58%	-47%	-37%	-57%
Oct-20	-46%	-89%	-50%	-85%	-96%	-52%	-34%	-32%	-51%
Nov-20	-41%	-79%	-52%	-82%	-97%	-42%	-33%	-26%	-48%
Dec-20	-36%	-82%	-54%	-75%	-97%	-34%	-31%	-25%	-47%
Vs 2019									
Jan '21 vs '19	-28%	-89%	-55%	-75%	-98%	-30%	1581%	-6%	-44%
Feb '21 vs '19	-33%	-86%	-64%	-72%	-98%	-36%	621%	-14%	-51%
Mar '21 vs '19	-32%	-86%	-51%	-67%	-98%	-33%	312%	-7%	-42%
Apr '21 vs '19	-34%	-82%	-46%	-68%	-97%	-31%	308%	-2%	-38%
May '21 vs '19	-42%	-79%	-47%	-65%	-97%	-35%	203%	-7%	-41%
Jun '21 vs '19	-40%	-84%	-51%	-61%	-98%	-34%	129%	-11%	-43%
Jul '21 vs '19	-37%	-83%	-47%	-60%	-96%	-28%	113%	-7%	-38%
Aug '21 vs '19	-35%	-81%	-62%	-64%	-97%	-27%	76%	-14%	-46%
Sep '21 vs '19	-28%	-76%	-51%	-68%	-98%	-26%	50%	-7%	-39%
Oct '21 vs '19	-21%	-70%	-46%	-63%	-98%	-22%	37%	-5%	-35%
Nov '21 vs '19	-13%	-67%	-56%	-56%	-93%	-17%	29%	-5%	-37%
Dec '21 vs '19	-10%	-72%	-53%	-54%	-88%	-13%	27%	-3%	-34%
Jan '22 vs '19	0%	-82%	-53%	-60%	-87%	3%	3259%	28%	-28%
Feb '22 vs '19	-12%	-82%	-54%	-62%	-87%	-6%	1297%	12%	-34%
Mar '22 vs '19	-15%	-81%	-57%	-65%	-83%	0%	948%	15%	-32%
Apr '22 vs '19	-18%	-77%	-61%	-72%	-79%	-3%	796%	18%	-35%
May '22 vs '19	-27%	-75%	-60%	-68%	-76%	-1%	541%	19%	-34%
Jun '22 vs '19	-29%	-78%	-56%	-67%	-72%	-1%	408%	19%	-32%
Jul '22 vs '19	-25%	-73%	-51%	-65%	-68%	3%	284%	18%	-29%
Aug '22 vs '19	-26%	-74%	-51%	-66%	-67%	1%	181%	21%	-29%
Sep '22 vs '19	-23%	-77%	-53%	-66%	-66%	-1%	143%	19%	-29%
Oct '22 vs '19	-24%	-72%	-55%	-66%	-65%	-3%	106%	18%	-31%
Nov '22 vs '19	-22%	-66%	-56%	-64%	-63%	4%	86%	17%	-29%
Dec '22 vs '19	-22%	-73%	-54%	-59%	-62%	5%	84%	17%	-28%
Jan '23 vs '19	-18%	-80%	-38%	-58%	-60%	32%	5327%	77%	-8%
Feb '23 vs '19	-1%	-84%	-35%	-56%	-59%	30%	2419%	72%	-6%
Mar '23 vs '19	-14%	-81%	-31%	-56%	-57%	31%	1491%	74%	-4%
Apr '23 vs '19	-25%	-71%	-28%	-59%	-57%	24%	1184%	78%	-3%
May '23 vs '19	-29%	-65%	-31%	-57%	-54%	23%	799%	77%	-5%
Jun '23 vs '19	-27%	-64%	-30%	-49%	-49%	24%	616%	78%	-4%
Jul '23 vs '19	-31%	-66%	-27%	-48%	-54%	22%	486%	77%	-3%
Aug '23 vs '19	-28%	-70%	-25%	-49%	-52%	18%	344%	79%	-2%
Sep '23 vs '19	-27%	-70%	-28%	-55%	-51%	18%	283%	76%	-4%
Oct '23 vs '19	-25%	-59%	-28%	-54%	-48%	23%	214%	76%	-2%
Nov '23 vs '19	-21%	-55%	-33%	-48%	-44%	23%	178%	71%	-4%
Dec '23 vs '19	-21%	-61%	-32%	-47%	-46%	20%	165%	69%	-3%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH



Exhibit 153: Airbus aircraft monthly average flight cycles yoy growth

Airbus' newest platforms (A320neo, A350, A220) outperformed legacy platforms (A320ceo, A330, A340, A380) in December 2023

YoY %	Airbus								
	A320neo	A320ceo	A330	A340	A350	A380	A300	A220	Airbus total
Jan-20	87%	0%	-1%	-21%	48%	4%	-5%	67%	8%
Feb-20	56%	-14%	-30%	-33%	20%	-6%	-6%	62%	-9%
Mar-20	10%	-42%	-57%	-62%	-23%	-44%	-13%	-6%	-38%
Apr-20	-74%	-87%	-83%	-87%	-68%	-99%	-4%	-71%	-85%
May-20	-68%	-86%	-77%	-80%	-56%	-99%	-9%	-68%	-82%
Jun-20	-49%	-79%	-77%	-87%	-52%	-99%	0%	-44%	-75%
Jul-20	-25%	-60%	-71%	-86%	-42%	-98%	-4%	-19%	-57%
Aug-20	-12%	-55%	-65%	-84%	-40%	-96%	-11%	-18%	-51%
Sep-20	-7%	-57%	-62%	-83%	-37%	-96%	0%	-26%	-51%
Oct-20	-6%	-57%	-55%	-81%	-32%	-96%	-5%	-41%	-51%
Nov-20	-6%	-56%	-53%	-74%	-26%	-95%	-3%	-41%	-49%
Dec-20	-1%	-52%	-52%	-71%	-25%	-94%	5%	-41%	-45%
Vs 2019									
Jan '21 vs '19	63%	-56%	-59%	-79%	-6%	-94%	-4%	-12%	-46%
Feb '21 vs '19	44%	-61%	-65%	-79%	-14%	-97%	-6%	-17%	-52%
Mar '21 vs '19	60%	-52%	-53%	-80%	-7%	-95%	1%	-14%	-42%
Apr '21 vs '19	56%	-50%	-49%	-75%	-2%	-93%	-2%	-11%	-40%
May '21 vs '19	29%	-52%	-50%	-75%	-7%	-92%	-10%	-5%	-44%
Jun '21 vs '19	29%	-50%	-53%	-71%	-11%	-92%	-6%	10%	-42%
Jul '21 vs '19	45%	-42%	-47%	-66%	-7%	-89%	-11%	29%	-33%
Aug '21 vs '19	44%	-45%	-57%	-67%	-14%	-89%	-12%	40%	-36%
Sep '21 vs '19	53%	-41%	-48%	-67%	-7%	-88%	0%	38%	-31%
Oct '21 vs '19	53%	-39%	-42%	-57%	-5%	-84%	-10%	37%	-28%
Nov '21 vs '19	49%	-42%	-47%	-51%	-5%	-74%	-1%	48%	-30%
Dec '21 vs '19	51%	-38%	-43%	-49%	-3%	-71%	9%	46%	-26%
Jan '22 vs '19	149%	-41%	-47%	-64%	28%	-70%	-11%	136%	-25%
Feb '22 vs '19	140%	-41%	-49%	-70%	12%	-69%	-9%	120%	-25%
Mar '22 vs '19	129%	-42%	-48%	-65%	15%	-65%	-3%	119%	-26%
Apr '22 vs '19	118%	-39%	-50%	-60%	18%	-62%	-6%	125%	-24%
May '22 vs '19	120%	-34%	-49%	-61%	19%	-59%	-12%	114%	-19%
Jun '22 vs '19	115%	-32%	-45%	-61%	19%	-61%	-1%	110%	-17%
Jul '22 vs '19	113%	-28%	-42%	-58%	18%	-58%	-12%	104%	-14%
Aug '22 vs '19	114%	-27%	-42%	-60%	21%	-58%	-10%	101%	-13%
Sep '22 vs '19	100%	-31%	-42%	-61%	19%	-55%	-3%	91%	-16%
Oct '22 vs '19	93%	-31%	-42%	-59%	18%	-51%	-20%	88%	-17%
Nov '22 vs '19	85%	-32%	-43%	-54%	17%	-46%	-6%	102%	-17%
Dec '22 vs '19	87%	-29%	-41%	-54%	17%	-45%	-10%	90%	-14%
Jan '23 vs '19	252%	-24%	-31%	-64%	77%	-42%	-24%	218%	-1%
Feb '23 vs '19	234%	-24%	-29%	-66%	72%	-39%	-22%	226%	-1%
Mar '23 vs '19	218%	-23%	-26%	-63%	74%	-40%	-20%	204%	-1%
Apr '23 vs '19	203%	-21%	-22%	-55%	78%	-37%	-26%	192%	1%
May '23 vs '19	188%	-20%	-24%	-53%	77%	-33%	-26%	179%	1%
Jun '23 vs '19	177%	-20%	-23%	-48%	78%	-34%	-21%	175%	1%
Jul '23 vs '19	178%	-18%	-19%	-46%	77%	-35%	-30%	157%	4%
Aug '23 vs '19	186%	-15%	-19%	-52%	79%	-35%	-27%	159%	7%
Sep '23 vs '19	172%	-17%	-20%	-47%	76%	-32%	-24%	144%	5%
Oct '23 vs '19	157%	-17%	-19%	-33%	76%	-30%	-32%	143%	5%
Nov '23 vs '19	144%	-19%	-21%	-32%	71%	-27%	-20%	140%	3%
Dec '23 vs '19	135%	-19%	-20%	-33%	69%	-32%	-26%	137%	3%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH



Exhibit 154: Boeing aircraft monthly average flight cycles yoy growth

787 exhibited the strongest performance in December 2023

YoY %	737 Org/Classic	737NG	747	757	767	777	787	717	Boeing Total
Jan-20	3%	3%	-5%	3%	6%	0%	22%	8%	0%
Feb-20	4%	-12%	-9%	4%	4%	-9%	0%	7%	-12%
Mar-20	-18%	-35%	-12%	-17%	-12%	-35%	-27%	-20%	-32%
Apr-20	-60%	-79%	-21%	-60%	-41%	-67%	-73%	-79%	-73%
May-20	-60%	-79%	-20%	-64%	-42%	-58%	-64%	-82%	-73%
Jun-20	-55%	-72%	-23%	-60%	-40%	-60%	-61%	-72%	-67%
Jul-20	-54%	-52%	-27%	-53%	-41%	-57%	-52%	-54%	-51%
Aug-20	-51%	-43%	-23%	-46%	-37%	-54%	-47%	-56%	-44%
Sep-20	-40%	-46%	-18%	-41%	-33%	-50%	-44%	-60%	-45%
Oct-20	-33%	-47%	-15%	-38%	-31%	-46%	-38%	-62%	-45%
Nov-20	-20%	-43%	-14%	-33%	-26%	-42%	-28%	-58%	-40%
Dec-20	-14%	-41%	-12%	-24%	-22%	-38%	-23%	-55%	-37%
Vs 2019									
Jan '21 vs '19	-19%	-47%	-11%	-31%	-26%	-44%	-19%	-53%	-44%
Feb '21 vs '19	-15%	-53%	-9%	-31%	-29%	-45%	-24%	-54%	-48%
Mar '21 vs '19	-13%	-40%	-15%	-27%	-23%	-43%	-14%	-52%	-37%
Apr '21 vs '19	-25%	-38%	-14%	-27%	-19%	-43%	-13%	-53%	-35%
May '21 vs '19	-31%	-40%	-14%	-34%	-23%	-42%	-19%	-54%	-36%
Jun '21 vs '19	-31%	-35%	-16%	-31%	-19%	-42%	-22%	-47%	-32%
Jul '21 vs '19	-36%	-29%	-16%	-31%	-18%	-39%	-16%	-48%	-27%
Aug '21 vs '19	-33%	-35%	-16%	-29%	-16%	-41%	-23%	-50%	-30%
Sep '21 vs '19	-23%	-28%	-12%	-23%	-13%	-38%	-19%	-46%	-24%
Oct '21 vs '19	-17%	-27%	-8%	-24%	-14%	-34%	-13%	-46%	-22%
Nov '21 vs '19	-4%	-31%	-12%	-15%	-8%	-32%	-13%	-40%	-24%
Dec '21 vs '19	-6%	-29%	-9%	-14%	-4%	-29%	-10%	-40%	-21%
Jan '22 vs '19	-9%	-30%	-13%	-17%	-7%	-35%	2%	-36%	-25%
Feb '22 vs '19	-5%	-29%	-10%	-17%	-10%	-34%	1%	-39%	-24%
Mar '22 vs '19	-6%	-33%	-19%	-16%	-6%	-32%	4%	-33%	-24%
Apr '22 vs '19	-20%	-33%	-21%	-25%	-7%	-34%	-1%	-34%	-24%
May '22 vs '19	-23%	-29%	-23%	-29%	-11%	-30%	1%	-32%	-21%
Jun '22 vs '19	-26%	-26%	-23%	-26%	-8%	-29%	0%	-33%	-18%
Jul '22 vs '19	-31%	-23%	-26%	-22%	-12%	-28%	2%	-32%	-16%
Aug '22 vs '19	-30%	-23%	-25%	-21%	-9%	-28%	1%	-32%	-15%
Sep '22 vs '19	-26%	-26%	-25%	-18%	-7%	-26%	-2%	-30%	-16%
Oct '22 vs '19	-23%	-28%	-21%	-26%	-11%	-26%	-3%	-26%	-17%
Nov '22 vs '19	-13%	-29%	-23%	-13%	-5%	-25%	-1%	-20%	-17%
Dec '22 vs '19	-14%	-28%	-25%	-16%	-7%	-22%	2%	-27%	-16%
Jan '23 vs '19	-16%	-18%	-32%	-14%	-5%	-22%	30%	-19%	-9%
Feb '23 vs '19	-13%	-17%	-18%	-10%	-3%	-20%	31%	-23%	-7%
Mar '23 vs '19	-17%	-17%	-20%	-14%	-2%	-19%	34%	-23%	-5%
Apr '23 vs '19	-30%	-16%	-21%	-25%	-5%	-16%	27%	-27%	-4%
May '23 vs '19	-31%	-16%	-25%	-27%	-7%	-14%	27%	-29%	-3%
Jun '23 vs '19	-33%	-17%	-22%	-24%	-4%	-11%	31%	-29%	-3%
Jul '23 vs '19	-38%	-14%	-24%	-28%	-11%	-10%	30%	-30%	-1%
Aug '23 vs '19	-35%	-11%	-27%	-25%	-6%	-12%	27%	-32%	2%
Sep '23 vs '19	-30%	-12%	-24%	-21%	-5%	-12%	25%	-24%	2%
Oct '23 vs '19	-29%	-12%	-21%	-24%	-8%	-10%	28%	-21%	2%
Nov '23 vs '19	-28%	-15%	-19%	-15%	-1%	-10%	25%	-18%	1%
Dec '23 vs '19	-30%	-15%	-21%	-19%	-5%	-10%	22%	-24%	1%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH



Exhibit 155: Other aircraft monthly average flight cycles yoy growth

Airbus A220 exhibited the strongest performance in December 2023

YoY%	ATR family	Embraer 135/145	Embraer E-Jet Family	Airbus A220	MD-11	MD-80	MD-90
Jan-20	19%	6%	12%	67%	-7%	-51%	-35%
Feb-20	17%	11%	4%	62%	-10%	-52%	-34%
Mar-20	-15%	-13%	-30%	-6%	-12%	-63%	-54%
Apr-20	-80%	-74%	-85%	-71%	-1%	-86%	-92%
May-20	-79%	-77%	-87%	-68%	-4%	-83%	-96%
Jun-20	-66%	-72%	-83%	-44%	-5%	-93%	-100%
Jul-20	-51%	-61%	-70%	-19%	0%	-91%	-100%
Aug-20	-47%	-63%	-63%	-18%	-2%	-88%	-100%
Sep-20	-49%	-65%	-62%	-26%	7%	-84%	-100%
Oct-20	-49%	-70%	-60%	-41%	-1%	-83%	-100%
Nov-20	-46%	-64%	-59%	-41%	-1%	-71%	-100%
Dec-20	-42%	-59%	-53%	-41%	5%	-66%	-100%
Vs 2019							
Jan '21 vs '19	-33%	-53%	-47%	-12%	-9%	-83%	-100%
Feb '21 vs '19	-36%	-55%	-58%	-17%	-12%	-82%	-100%
Mar '21 vs '19	-34%	-50%	-53%	-14%	-4%	-85%	-100%
Apr '21 vs '19	-36%	-45%	-50%	-11%	0%	-87%	-100%
May '21 vs '19	-41%	-47%	-50%	-5%	-6%	-89%	-100%
Jun '21 vs '19	-38%	-40%	-43%	10%	-2%	-86%	-100%
Jul '21 vs '19	-34%	-39%	-36%	29%	0%	-85%	-100%
Aug '21 vs '19	-34%	-42%	-36%	40%	-5%	-82%	-100%
Sep '21 vs '19	-33%	-46%	-34%	38%	2%	-77%	-100%
Oct '21 vs '19	-30%	-45%	-34%	37%	-6%	-73%	-100%
Nov '21 vs '19	-24%	-42%	-32%	48%	-2%	-71%	-100%
Dec '21 vs '19	-22%	-43%	-33%	46%	2%	-68%	-100%
Jan '22 vs '19	-12%	-42%	-31%	136%	-17%	-85%	-100%
Feb '22 vs '19	-15%	-40%	-32%	120%	-13%	-85%	-100%
Mar '22 vs '19	-11%	-42%	-29%	119%	-6%	-85%	-100%
Apr '22 vs '19	-7%	-40%	-27%	125%	-8%	-85%	-100%
May '22 vs '19	-5%	-43%	-23%	114%	-12%	-85%	-100%
Jun '22 vs '19	-4%	-44%	-26%	110%	-6%	-85%	-100%
Jul '22 vs '19	3%	-44%	-25%	104%	-8%	-86%	-100%
Aug '22 vs '19	-1%	-46%	-27%	101%	-6%	-83%	-100%
Sep '22 vs '19	-4%	-50%	-27%	91%	-3%	-77%	-100%
Oct '22 vs '19	-8%	-52%	-27%	88%	-15%	-75%	-100%
Nov '22 vs '19	-8%	-53%	-28%	102%	-6%	-73%	-100%
Dec '22 vs '19	-7%	-55%	-29%	90%	-14%	-71%	-100%
Jan '23 vs '19	10%	-49%	-16%	218%	-23%	-86%	-99%
Feb '23 vs '19	7%	-46%	-16%	226%	-22%	-83%	-99%
Mar '23 vs '19	9%	-47%	-16%	204%	-17%	-85%	-100%
Apr '23 vs '19	7%	-48%	-17%	192%	-24%	-85%	-100%
May '23 vs '19	11%	-49%	-16%	179%	-30%	-86%	-100%
Jun '23 vs '19	10%	-51%	-20%	175%	-29%	-85%	-100%
Jul '23 vs '19	17%	-51%	-19%	157%	-32%	-84%	-100%
Aug '23 vs '19	10%	-53%	-19%	159%	-25%	-83%	-100%
Sep '23 vs '19	6%	-54%	-19%	144%	-26%	-77%	-100%
Oct '23 vs '19	0%	-55%	-21%	143%	-31%	-77%	-100%
Nov '23 vs '19	-1%	-54%	-21%	140%	-26%	-76%	-100%
Dec '23 vs '19	-4%	-54%	-21%	137%	-32%	-70%	-100%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH



Exhibit 156: Regional flight cycles yoy growth

Africa reported the strongest performance in December 2023

	Africa	Asia-Pacific	Europe	Latin America	Middle East	North America	Global
Jan-20	21%	6%	2%	8%	3%	10%	8%
Feb-20	19%	-22%	-2%	9%	2%	14%	-5%
Mar-20	-26%	-40%	-39%	-23%	-47%	-13%	-32%
Apr-20	-90%	-73%	-90%	-90%	-88%	-65%	-80%
May-20	-87%	-69%	-87%	-87%	-84%	-63%	-79%
Jun-20	-83%	-62%	-80%	-83%	-78%	-53%	-72%
Jul-20	-71%	-49%	-61%	-79%	-73%	-40%	-56%
Aug-20	-63%	-44%	-49%	-74%	-69%	-36%	-49%
Sep-20	-59%	-41%	-51%	-66%	-62%	-36%	-49%
Oct-20	-55%	-40%	-55%	-56%	-58%	-34%	-49%
Nov-20	-51%	-36%	-61%	-47%	-52%	-30%	-46%
Dec-20	-42%	-32%	-61%	-39%	-51%	-30%	-43%
Vs 2019							
Jan '21 vs '19	-34%	-39%	-62%	-31%	-48%	-26%	-44%
Feb '21 vs '19	-38%	-44%	-66%	-37%	-48%	-27%	-49%
Mar '21 vs '19	-36%	-27%	-63%	-40%	-46%	-19%	-40%
Apr '21 vs '19	-38%	-24%	-62%	-45%	-44%	-17%	-38%
May '21 vs '19	-34%	-35%	-61%	-40%	-42%	-16%	-40%
Jun '21 vs '19	-27%	-40%	-48%	-32%	-43%	-10%	-37%
Jul '21 vs '19	-25%	-39%	-33%	-27%	-41%	-7%	-30%
Aug '21 vs '19	-22%	-49%	-27%	-24%	-39%	-8%	-33%
Sep '21 vs '19	-19%	-40%	-27%	-19%	-30%	-1%	-28%
Oct '21 vs '19	-18%	-36%	-24%	-17%	-25%	-5%	-26%
Nov '21 vs '19	-15%	-41%	-22%	-11%	-19%	-1%	-28%
Dec '21 vs '19	-21%	-35%	-21%	-9%	-18%	-5%	-25%
Jan '22 vs '19	-8%	-34%	-28%	-7%	-21%	0%	-24%
Feb '22 vs '19	-3%	-36%	-28%	-9%	-18%	5%	-25%
Mar '22 vs '19	-11%	-39%	-22%	-1%	-13%	2%	-26%
Apr '22 vs '19	-13%	-39%	-17%	5%	-12%	2%	-24%
May '22 vs '19	-8%	-35%	-13%	11%	-5%	1%	-21%
Jun '22 vs '19	-13%	-30%	-13%	8%	-13%	3%	-20%
Jul '22 vs '19	-15%	-27%	-12%	5%	-10%	2%	-18%
Aug '22 vs '19	-15%	-25%	-11%	7%	-11%	3%	-17%
Sep '22 vs '19	-16%	-30%	-12%	6%	-5%	7%	-19%
Oct '22 vs '19	-12%	-31%	-11%	7%	-4%	4%	-20%
Nov '22 vs '19	-5%	-30%	-13%	5%	2%	2%	-20%
Dec '22 vs '19	-3%	-26%	-13%	4%	2%	-4%	-20%
Jan '23 vs '19	16%	-12%	-12%	13%	4%	9%	-8%
Feb '23 vs '19	19%	-10%	-12%	11%	7%	14%	-8%
Mar '23 vs '19	10%	-8%	-11%	17%	9%	8%	-8%
Apr '23 vs '19	4%	-5%	-9%	17%	9%	7%	-7%
May '23 vs '19	10%	-5%	-7%	23%	14%	8%	-7%
Jun '23 vs '19	6%	-5%	-6%	22%	10%	6%	-8%
Jul '23 vs '19	5%	-2%	-5%	16%	9%	7%	-6%
Aug '23 vs '19	4%	3%	-5%	19%	6%	9%	-3%
Sep '23 vs '19	4%	0%	-5%	16%	13%	11%	-4%
Oct '23 vs '19	7%	-1%	-4%	13%	10%	10%	-4%
Nov '23 vs '19	11%	-2%	-7%	13%	10%	10%	-5%
Dec '23 vs '19	12%	-2%	-6%	10%	8%	5%	-6%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH



Exhibit 157: CFM monthly engine hours growth vs 2019

CFM LEAP 1-B exhibited the strongest performance in December 2023

	CF6	CFM LEAP 1-B	CFM/V2500	CFM56-5B	CFM56-5C	CFM56-7B	CFMLEAP 1-A
Jan-20	6%	-100%	845%	6%	-22%	7%	92%
Feb-20	4%	-100%	386%	-6%	-28%	-2%	70%
Mar-20	-16%	-100%	70%	-34%	-54%	-27%	18%
Apr-20	-50%	-89%	-99%	-88%	-88%	-83%	-82%
May-20	-48%	-77%	-99%	-90%	-88%	-86%	-80%
Jun-20	-45%	-76%	-98%	-84%	-88%	-80%	-68%
Jul-20	-48%	-60%	-53%	-58%	-89%	-55%	-38%
Aug-20	-45%	-26%	-26%	-49%	-84%	-45%	-17%
Sep-20	-42%	-57%	-37%	-50%	-83%	-47%	-15%
Oct-20	-38%	-77%	-81%	-59%	-82%	-54%	-27%
Nov-20	-33%	-71%	-100%	-55%	-74%	-48%	-30%
Dec-20	-33%	616%	-100%	-46%	-67%	-40%	-22%
Jan-21	-32%	-93%	-100%	-44%	-75%	-40%	28%
Feb-21	-34%	-88%	-100%	-53%	-76%	-50%	6%
Mar-21	-31%	-54%	-100%	-41%	-79%	-39%	23%
Apr-21	-29%	10597%	-100%	-39%	-72%	-36%	25%
May-21	-31%	12146%	-100%	-41%	-73%	-36%	13%
Jun-21	-32%	21191%	-100%	-39%	-70%	-31%	15%
Jul-21	-29%	37926%	-100%	-30%	-63%	-25%	29%
Aug-21	-26%	54922%	-100%	-35%	-63%	-28%	34%
Sep-21	-23%	32373%	-100%	-29%	-63%	-22%	40%
Oct-21	-21%	28301%	-100%	-29%	-54%	-21%	36%
Nov-21	-18%	37863%	-100%	-39%	-43%	-29%	23%
Dec-21	-17%	62966%	-100%	-39%	-37%	-29%	17%
Jan-22	-16%	48%	-100%	-40%	-49%	-29%	94%
Feb-22	-15%	46%	-100%	-41%	-55%	-28%	92%
Mar-22	-17%	217%	-100%	-41%	-53%	-30%	85%
Apr-22	-14%	65284%	-100%	-38%	-48%	-29%	85%
May-22	-17%	67474%	-100%	-33%	-52%	-25%	86%
Jun-22	-17%	70224%	-100%	-31%	-49%	-24%	81%
Jul-22	-19%	105831%	-100%	-26%	-49%	-22%	73%
Aug-22	-18%	131429%	-100%	-26%	-51%	-22%	81%
Sep-22	-17%	75035%	-100%	-29%	-51%	-23%	75%
Oct-22	-15%	62423%	-100%	-31%	-52%	-25%	68%
Nov-22	-15%	77322%	-100%	-33%	-48%	-26%	62%
Dec-22	-16%	118775%	-100%	-34%	-45%	-27%	51%
Jan-23	-15%	210%	-100%	-25%	-53%	-17%	178%
Feb-23	-14%	195%	-100%	-25%	-55%	-16%	173%
Mar-23	-14%	503%	-100%	-26%	-57%	-18%	160%
Apr-23	-13%	117070%	-100%	-24%	-56%	-18%	148%
May-23	-17%	116047%	-100%	-25%	-55%	-20%	134%
Jun-23	-17%	121622%	-100%	-24%	-53%	-20%	125%
Jul-23	-18%	179673%	-100%	-18%	-46%	-16%	123%
Aug-23	-16%	226064%	-100%	-9%	-48%	-8%	149%
Sep-23	-15%	126438%	-100%	-12%	-44%	-9%	139%
Oct-23	-15%	102826%	-100%	-16%	-40%	-12%	123%
Nov-23	-13%	124558%	-100%	-18%	-35%	-15%	113%
Dec-23	-14%	193321%	-100%	-19%	-32%	-16%	96%

Source: BofA Global Research, Flightradar24

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Exhibit 158: GE, P&W monthly engine hours growth vs 2019

PW1900G exhibited the strongest performance in December 2023

	GE CF34	GE90	GENX	GENX-2B	GP7200	PW100	PW1100G	PW1500G	PW1900G	PW2000	PW4000
Jan-20	14%	1%	20%	19%	9%	20%	104%	82%	342%	6%	1%
Feb-20	13%	-6%	2%	-9%	0%	22%	79%	88%	357%	6%	-10%
Mar-20	-9%	-28%	-22%	-14%	-31%	-4%	27%	31%	244%	-11%	-41%
Apr-20	-75%	-66%	-78%	-20%	-99%	-80%	-74%	-69%	-38%	-66%	-72%
May-20	-78%	-58%	-68%	-25%	-100%	-81%	-74%	-68%	7%	-71%	-69%
Jun-20	-73%	-54%	-60%	-18%	-100%	-67%	-53%	-43%	10%	-69%	-67%
Jul-20	-55%	-53%	-53%	-17%	-99%	-52%	-23%	-14%	47%	-62%	-68%
Aug-20	-48%	-51%	-47%	-17%	-97%	-45%	-10%	-16%	41%	-51%	-64%
Sep-20	-45%	-47%	-44%	-17%	-97%	-45%	0%	-19%	51%	-45%	-62%
Oct-20	-45%	-42%	-40%	-20%	-97%	-46%	-4%	-40%	66%	-40%	-59%
Nov-20	-41%	-38%	-33%	-18%	-96%	-43%	-1%	-42%	29%	-29%	-52%
Dec-20	-36%	-41%	-35%	-17%	-95%	-39%	8%	-39%	8%	-24%	-50%
Jan-21	-25%	-44%	-28%	5%	-94%	-26%	107%	8%	365%	-26%	-61%
Feb-21	-33%	-41%	-28%	-13%	-98%	-29%	83%	-5%	264%	-30%	-63%
Mar-21	-27%	-37%	-18%	-15%	-96%	-27%	88%	10%	306%	-29%	-54%
Apr-21	-22%	-34%	-16%	-13%	-95%	-29%	89%	7%	294%	-27%	-49%
May-21	-21%	-35%	-20%	-11%	-93%	-35%	56%	10%	317%	-30%	-47%
Jun-21	-16%	-36%	-20%	-12%	-93%	-32%	45%	41%	258%	-34%	-48%
Jul-21	-9%	-34%	-19%	-8%	-88%	-30%	54%	53%	368%	-33%	-43%
Aug-21	-9%	-33%	-20%	-7%	-87%	-28%	58%	63%	322%	-30%	-44%
Sep-21	-8%	-30%	-19%	-2%	-85%	-26%	69%	63%	306%	-26%	-40%
Oct-21	-11%	-27%	-15%	-1%	-81%	-21%	72%	61%	323%	-27%	-36%
Nov-21	-10%	-24%	-14%	-2%	-71%	-15%	64%	73%	205%	-20%	-39%
Dec-21	-13%	-24%	-14%	-2%	-70%	-13%	67%	77%	140%	-21%	-34%
Jan-22	-9%	-27%	0%	12%	-66%	-4%	196%	216%	719%	-21%	-43%
Feb-22	-11%	-26%	-3%	-3%	-66%	-6%	177%	200%	736%	-22%	-45%
Mar-22	-12%	-24%	0%	-14%	-61%	-2%	173%	199%	785%	-25%	-41%
Apr-22	-9%	-22%	3%	-11%	-56%	4%	168%	200%	902%	-29%	-40%
May-22	-10%	-21%	4%	-13%	-52%	9%	164%	179%	835%	-33%	-41%
Jun-22	-14%	-20%	4%	-6%	-55%	9%	149%	174%	559%	-38%	-40%
Jul-22	-14%	-17%	3%	-8%	-51%	9%	139%	153%	614%	-34%	-38%
Aug-22	-16%	-17%	2%	-4%	-53%	7%	136%	138%	474%	-37%	-38%
Sep-22	-13%	-17%	-1%	-4%	-50%	4%	123%	130%	472%	-32%	-39%
Oct-22	-17%	-16%	-1%	-3%	-46%	2%	117%	122%	481%	-34%	-38%
Nov-22	-19%	-15%	-2%	-6%	-39%	2%	104%	139%	315%	-28%	-37%
Dec-22	-22%	-15%	0%	-6%	-40%	2%	99%	134%	223%	-26%	-33%
Jan-23	-7%	-14%	23%	17%	-33%	23%	303%	334%	1242%	-23%	-37%
Feb-23	-5%	-13%	21%	-1%	-32%	19%	284%	353%	1308%	-27%	-35%
Mar-23	-8%	-13%	21%	-1%	-35%	19%	247%	327%	1416%	-29%	-34%
Apr-23	-6%	-11%	20%	-3%	-27%	20%	223%	281%	1357%	-32%	-30%
May-23	-8%	-10%	19%	-5%	-21%	24%	197%	260%	1249%	-33%	-31%
Jun-23	-12%	-9%	22%	-3%	-29%	22%	176%	253%	989%	-34%	-29%
Jul-23	-11%	-7%	22%	-2%	-29%	21%	174%	217%	1072%	-34%	-28%
Aug-23	-10%	-3%	26%	3%	-28%	21%	190%	198%	922%	-34%	-25%
Sep-23	-7%	-2%	24%	6%	-24%	18%	173%	187%	924%	-30%	-26%
Oct-23	-9%	-2%	24%	5%	-23%	14%	147%	181%	973%	-31%	-25%
Nov-23	-9%	-1%	20%	4%	-20%	10%	127%	197%	672%	-29%	-28%
Dec-23	-11%	-1%	20%	6%	-28%	7%	117%	193%	515%	-27%	-25%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH



Exhibit 159: Trent monthly engine hours growth vs 2019
 Trent 7000 exhibited the best performance vs 2019 as of December 2023

RB211	TRENT 1000	TRENT 700	TRENT 7000	TRENT 800	TRENT 900	TRENT XWB	V2500
Jan-20	28%	16%	2%	2531%	15%	3%	45%
Feb-20	39%	4%	-24%	1061%	-2%	-12%	29%
Mar-20	4%	-23%	-53%	506%	-36%	-40%	-11%
Apr-20	-72%	-77%	-86%	-6%	-89%	-96%	-71%
May-20	-72%	-71%	-80%	-30%	-88%	-99%	-62%
Jun-20	-73%	-67%	-79%	-27%	-88%	-98%	-58%
Jul-20	-70%	-69%	-75%	-46%	-88%	-97%	-50%
Aug-20	-65%	-66%	-70%	-50%	-89%	-97%	-44%
Sep-20	-66%	-63%	-68%	-47%	-84%	-96%	-42%
Oct-20	-63%	-59%	-65%	-45%	-82%	-97%	-39%
Nov-20	-58%	-50%	-61%	-43%	-81%	-97%	-32%
Dec-20	-55%	-47%	-62%	-45%	-79%	-97%	-37%
Jan-21	-50%	-47%	-62%	1307%	-75%	-98%	-16%
Feb-21	-49%	-47%	-67%	472%	-72%	-99%	-15%
Mar-21	-52%	-45%	-59%	290%	-65%	-98%	-8%
Apr-21	-54%	-41%	-55%	261%	-69%	-98%	-8%
May-21	-56%	-44%	-54%	199%	-67%	-97%	-13%
Jun-21	-57%	-44%	-58%	179%	-60%	-98%	-15%
Jul-21	-52%	-40%	-56%	131%	-59%	-98%	-12%
Aug-21	-47%	-37%	-63%	69%	-60%	-97%	-11%
Sep-21	-42%	-33%	-57%	41%	-61%	-98%	-5%
Oct-21	-38%	-31%	-52%	26%	-58%	-98%	-5%
Nov-21	-39%	-25%	-55%	28%	-57%	-97%	-2%
Dec-21	-38%	-23%	-54%	18%	-54%	-90%	-6%
Jan-22	-32%	-13%	-55%	3038%	-54%	-88%	24%
Feb-22	-36%	-19%	-56%	1286%	-57%	-88%	13%
Mar-22	-38%	-17%	-56%	981%	-58%	-87%	11%
Apr-22	-39%	-15%	-58%	815%	-60%	-81%	14%
May-22	-44%	-12%	-58%	598%	-57%	-79%	10%
Jun-22	-49%	-12%	-55%	536%	-56%	-75%	13%
Jul-22	-41%	-8%	-54%	340%	-55%	-72%	12%
Aug-22	-42%	-8%	-52%	199%	-55%	-68%	15%
Sep-22	-41%	-5%	-52%	156%	-52%	-66%	15%
Oct-22	-42%	-7%	-53%	118%	-52%	-66%	14%
Nov-22	-43%	-5%	-53%	104%	-53%	-61%	17%
Dec-22	-43%	-4%	-53%	94%	-50%	-62%	15%
Jan-23	-42%	13%	-46%	5415%	-47%	-59%	64%
Feb-23	-35%	8%	-43%	2525%	-49%	-59%	59%
Mar-23	-42%	8%	-42%	1700%	-49%	-58%	54%
Apr-23	-48%	8%	-41%	1256%	-54%	-57%	56%
May-23	-51%	7%	-44%	925%	-50%	-57%	52%
Jun-23	-48%	7%	-45%	785%	-45%	-55%	52%
Jul-23	-47%	8%	-39%	528%	-44%	-56%	55%
Aug-23	-45%	9%	-29%	366%	-44%	-55%	65%
Sep-23	-43%	11%	-31%	294%	-47%	-54%	64%
Oct-23	-43%	12%	-33%	223%	-49%	-54%	62%
Nov-23	-42%	11%	-34%	195%	-47%	-46%	62%
Dec-23	-40%	9%	-33%	176%	-45%	-48%	57%

Source: BofA Global Research, Flightradar24

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Exhibit 160: CFM56-5B monthly engine hours growth vs 2019

LatAm exhibited the strongest performance in December 2023

	CFM56-5B Monthly Data vs 2019					
	Africa	Europe	North America	Latin America	Middle East	APAC
Jan-20	24%	1%	18%	3%	9%	3%
Feb-20	23%	0%	16%	6%	10%	-29%
Mar-20	-18%	-34%	-2%	-21%	-44%	-58%
Apr-20	-94%	-96%	-72%	-97%	-98%	-89%
May-20	-93%	-96%	-80%	-97%	-97%	-89%
Jun-20	-84%	-92%	-72%	-94%	-90%	-85%
Jul-20	-57%	-73%	-55%	-91%	-85%	-46%
Aug-20	-50%	-58%	-52%	-86%	-83%	-38%
Sep-20	-53%	-63%	-51%	-78%	-80%	-39%
Oct-20	-62%	-71%	-50%	-66%	-76%	-54%
Nov-20	-67%	-81%	-45%	-53%	-71%	-46%
Dec-20	-62%	-78%	-46%	-51%	-73%	-30%
Jan-21	-49%	-76%	-35%	-44%	-68%	-37%
Feb-21	-59%	-82%	-38%	-47%	-66%	-49%
Mar-21	-60%	-81%	-31%	-55%	-67%	-25%
Apr-21	-63%	-78%	-27%	-60%	-63%	-22%
May-21	-51%	-76%	-26%	-55%	-62%	-31%
Jun-21	-24%	-65%	-22%	-43%	-64%	-39%
Jul-21	-13%	-47%	-21%	-36%	-56%	-37%
Aug-21	-17%	-38%	-24%	-32%	-54%	-50%
Sep-21	-22%	-40%	-20%	-24%	-48%	-39%
Oct-21	-39%	-42%	-20%	-22%	-49%	-37%
Nov-21	-42%	-39%	-17%	-14%	-45%	-61%
Dec-21	-54%	-39%	-19%	-13%	-41%	-60%
Jan-22	-49%	-45%	-6%	-16%	-41%	-62%
Feb-22	-42%	-49%	-10%	-18%	-40%	-62%
Mar-22	-49%	-45%	-6%	-15%	-38%	-69%
Apr-22	-42%	-34%	-3%	-6%	-34%	-73%
May-22	-35%	-30%	-7%	-1%	-25%	-65%
Jun-22	-34%	-27%	-10%	-3%	-33%	-60%
Jul-22	-37%	-23%	-7%	0%	-25%	-55%
Aug-22	-41%	-22%	-11%	3%	-26%	-52%
Sep-22	-42%	-23%	-9%	3%	-29%	-58%
Oct-22	-39%	-26%	-13%	0%	-33%	-56%
Nov-22	-33%	-31%	-11%	-6%	-33%	-57%
Dec-22	-31%	-34%	-15%	-6%	-32%	-55%
Jan-23	-24%	-33%	0%	-1%	-24%	-42%
Feb-23	-23%	-34%	-4%	-3%	-24%	-38%
Mar-23	-27%	-33%	-5%	-6%	-26%	-40%
Apr-23	-34%	-29%	-3%	2%	-25%	-39%
May-23	-25%	-28%	-7%	6%	-20%	-43%
Jun-23	-33%	-25%	-7%	7%	-26%	-41%
Jul-23	-40%	-23%	-7%	2%	-23%	-29%
Aug-23	-45%	-24%	-10%	4%	-25%	-3%
Sep-23	-45%	-24%	-9%	4%	-25%	-13%
Oct-23	-42%	-26%	-11%	0%	-29%	-21%
Nov-23	-37%	-27%	-12%	2%	-30%	-25%
Dec-23	-34%	-30%	-15%	-2%	-32%	-24%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH



Exhibit 161: CFM56-7B monthly engine hours growth vs 2019

APAC remained the best-performing region in December 2023

	CFM56-7B Monthly Data vs 2019					
	Africa	Europe	North America	Latin America	Middle East	APAC
Jan-20	49%	3%	11%	12%	-5%	5%
Feb-20	53%	3%	9%	17%	3%	-25%
Mar-20	-3%	-30%	-8%	-11%	-46%	-52%
Apr-20	-97%	-96%	-70%	-96%	-98%	-83%
May-20	-94%	-97%	-77%	-95%	-95%	-87%
Jun-20	-91%	-92%	-68%	-91%	-91%	-83%
Jul-20	-81%	-65%	-53%	-84%	-85%	-49%
Aug-20	-72%	-50%	-47%	-79%	-82%	-37%
Sep-20	-67%	-53%	-50%	-72%	-78%	-39%
Oct-20	-65%	-60%	-50%	-61%	-73%	-54%
Nov-20	-64%	-66%	-44%	-56%	-69%	-44%
Dec-20	-57%	-67%	-44%	-48%	-62%	-27%
Jan-21	-37%	-69%	-37%	-36%	-62%	-37%
Feb-21	-38%	-77%	-44%	-48%	-59%	-51%
Mar-21	-41%	-77%	-37%	-57%	-57%	-26%
Apr-21	-38%	-74%	-32%	-70%	-51%	-18%
May-21	-38%	-73%	-29%	-65%	-55%	-21%
Jun-21	-35%	-55%	-24%	-59%	-65%	-30%
Jul-21	-32%	-35%	-21%	-52%	-56%	-34%
Aug-21	-34%	-25%	-19%	-53%	-52%	-50%
Sep-21	-30%	-23%	-16%	-50%	-46%	-39%
Oct-21	-31%	-21%	-18%	-49%	-37%	-37%
Nov-21	-35%	-19%	-17%	-44%	-29%	-57%
Dec-21	-46%	-20%	-19%	-39%	-21%	-54%
Jan-22	-26%	-28%	-12%	-24%	-37%	-54%
Feb-22	-12%	-24%	-12%	-28%	-33%	-58%
Mar-22	-22%	-23%	-14%	-29%	-34%	-62%
Apr-22	-20%	-18%	-14%	-29%	-32%	-61%
May-22	-16%	-16%	-14%	-27%	-26%	-54%
Jun-22	-29%	-13%	-14%	-31%	-37%	-52%
Jul-22	-32%	-13%	-15%	-31%	-20%	-47%
Aug-22	-35%	-12%	-14%	-30%	-23%	-45%
Sep-22	-36%	-14%	-12%	-33%	-24%	-49%
Oct-22	-34%	-14%	-16%	-29%	-25%	-49%
Nov-22	-31%	-17%	-16%	-30%	-21%	-47%
Dec-22	-32%	-18%	-21%	-29%	-13%	-45%
Jan-23	-3%	-17%	-8%	-18%	-20%	-33%
Feb-23	-1%	-17%	-9%	-18%	-14%	-30%
Mar-23	-6%	-17%	-13%	-18%	-19%	-33%
Apr-23	-10%	-13%	-14%	-18%	-17%	-33%
May-23	-8%	-13%	-15%	-15%	-10%	-39%
Jun-23	-14%	-12%	-15%	-18%	-21%	-40%
Jul-23	-19%	-11%	-15%	-26%	-15%	-28%
Aug-23	-24%	-11%	-15%	-23%	-18%	-5%
Sep-23	-24%	-12%	-14%	-29%	-17%	-9%
Oct-23	-24%	-12%	-14%	-28%	-21%	-14%
Nov-23	-26%	-16%	-17%	-31%	-27%	-17%
Dec-23	-24%	-17%	-18%	-35%	-25%	-17%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH



Exhibit 162: CF6 monthly engine hours growth vs 2019

North America was the best-performing region as of December 2023

	Africa	Europe	North America	Latin America	Middle East	APAC
Jan-20	24%	2%	19%	19%	4%	-7%
Feb-20	4%	-1%	16%	20%	1%	-10%
Mar-20	-29%	-30%	5%	0%	-35%	-34%
Apr-20	-70%	-75%	-28%	-62%	-65%	-57%
May-20	-68%	-73%	-25%	-60%	-64%	-53%
Jun-20	-65%	-74%	-24%	-60%	-59%	-43%
Jul-20	-57%	-74%	-27%	-59%	-64%	-48%
Aug-20	-55%	-70%	-24%	-54%	-60%	-44%
Sep-20	-48%	-68%	-21%	-52%	-51%	-42%
Oct-20	-48%	-65%	-17%	-50%	-48%	-39%
Nov-20	-37%	-56%	-12%	-53%	-57%	-35%
Dec-20	-38%	-55%	-14%	-46%	-59%	-40%
Jan-21	-19%	-57%	-1%	-38%	-66%	-46%
Feb-21	-25%	-57%	-6%	-40%	-67%	-48%
Mar-21	-26%	-56%	-2%	-41%	-67%	-42%
Apr-21	-17%	-56%	-2%	-39%	-63%	-40%
May-21	-13%	-60%	-4%	-37%	-67%	-40%
Jun-21	-24%	-60%	-5%	-37%	-60%	-41%
Jul-21	-25%	-54%	-2%	-38%	-61%	-37%
Aug-21	-32%	-49%	2%	-38%	-56%	-36%
Sep-21	-20%	-46%	6%	-37%	-47%	-35%
Oct-21	-24%	-43%	5%	-33%	-40%	-30%
Nov-21	-18%	-37%	3%	-33%	-40%	-25%
Dec-21	-27%	-35%	2%	-34%	-48%	-27%
Jan-22	-9%	-38%	14%	-27%	-49%	-32%
Feb-22	-8%	-36%	12%	-20%	-49%	-33%
Mar-22	-13%	-36%	9%	-21%	-46%	-33%
Apr-22	8%	-33%	9%	-16%	-42%	-27%
May-22	10%	-33%	3%	-20%	-44%	-29%
Jun-22	6%	-31%	0%	-28%	-33%	-27%
Jul-22	9%	-33%	-1%	-26%	-34%	-28%
Aug-22	5%	-31%	1%	-25%	-43%	-28%
Sep-22	7%	-30%	4%	-25%	-38%	-27%
Oct-22	2%	-27%	3%	-28%	-33%	-24%
Nov-22	4%	-23%	0%	-28%	-43%	-22%
Dec-22	-6%	-23%	-5%	-30%	-46%	-23%
Jan-23	16%	-25%	9%	-21%	-37%	-32%
Feb-23	8%	-23%	6%	-19%	-34%	-30%
Mar-23	2%	-24%	5%	-21%	-37%	-28%
Apr-23	10%	-22%	3%	-18%	-28%	-28%
May-23	14%	-26%	0%	-20%	-32%	-32%
Jun-23	3%	-26%	-2%	-17%	-26%	-32%
Jul-23	-5%	-28%	-3%	-15%	-33%	-29%
Aug-23	-13%	-27%	1%	-15%	-50%	-22%
Sep-23	3%	-27%	3%	-17%	-41%	-22%
Oct-23	-5%	-25%	2%	-21%	-37%	-21%
Nov-23	1%	-21%	0%	-20%	-49%	-16%
Dec-23	-7%	-22%	-6%	-22%	-51%	-15%

Source: BofA Global Research, Flightradar24

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Exhibit 163: GE90 monthly engine hours growth vs 2019

North America led the recovery in December 2023

	Africa	Europe	North America	Latin America	Middle East	APAC
Jan-20	5%	2%	5%	-3%	0%	3%
Feb-20	5%	0%	-3%	0%	-2%	-13%
Mar-20	-13%	-21%	-21%	-19%	-26%	-39%
Apr-20	-68%	-66%	-66%	-82%	-67%	-65%
May-20	-52%	-59%	-57%	-81%	-52%	-58%
Jun-20	-50%	-58%	-55%	-76%	-53%	-49%
Jul-20	-46%	-56%	-55%	-71%	-50%	-48%
Aug-20	-43%	-54%	-54%	-68%	-46%	-46%
Sep-20	-34%	-50%	-50%	-63%	-38%	-44%
Oct-20	-21%	-45%	-46%	-61%	-34%	-40%
Nov-20	-31%	-43%	-38%	-55%	-36%	-34%
Dec-20	-31%	-43%	-42%	-46%	-39%	-40%
Jan-21	-33%	-44%	-44%	-48%	-40%	-46%
Feb-21	-30%	-41%	-42%	-45%	-35%	-43%
Mar-21	-25%	-40%	-40%	-49%	-30%	-34%
Apr-21	-25%	-38%	-38%	-48%	-25%	-31%
May-21	-19%	-40%	-41%	-45%	-21%	-33%
Jun-21	-26%	-39%	-39%	-37%	-30%	-34%
Jul-21	-20%	-36%	-34%	-38%	-28%	-35%
Aug-21	-16%	-34%	-29%	-39%	-28%	-37%
Sep-21	-11%	-32%	-24%	-42%	-21%	-35%
Oct-21	-15%	-29%	-21%	-39%	-20%	-31%
Nov-21	-17%	-23%	-15%	-40%	-18%	-31%
Dec-21	-21%	-22%	-15%	-39%	-18%	-33%
Jan-22	-19%	-23%	-14%	-33%	-22%	-36%
Feb-22	-12%	-24%	-17%	-30%	-21%	-36%
Mar-22	-12%	-23%	-15%	-34%	-16%	-33%
Apr-22	-2%	-19%	-14%	-35%	-11%	-35%
May-22	0%	-18%	-15%	-34%	-4%	-34%
Jun-22	-8%	-15%	-12%	-29%	-15%	-32%
Jul-22	0%	-11%	-7%	-25%	-11%	-30%
Aug-22	-1%	-10%	-9%	-24%	-10%	-31%
Sep-22	-3%	-11%	-7%	-27%	-8%	-29%
Oct-22	-3%	-12%	-7%	-26%	-6%	-28%
Nov-22	-14%	-10%	-6%	-12%	-7%	-26%
Dec-22	-11%	-9%	-7%	-16%	-9%	-28%
Jan-23	-2%	-10%	-2%	-19%	-9%	-25%
Feb-23	-1%	-9%	-4%	-17%	-8%	-24%
Mar-23	2%	-11%	-4%	-19%	-8%	-22%
Apr-23	-7%	-6%	-4%	-26%	-2%	-21%
May-23	-6%	0%	-4%	-26%	11%	-25%
Jun-23	-12%	1%	-2%	-22%	-1%	-23%
Jul-23	-6%	2%	1%	-22%	1%	-18%
Aug-23	-1%	5%	1%	-23%	-1%	-7%
Sep-23	0%	4%	3%	-25%	1%	-7%
Oct-23	0%	6%	2%	-23%	0%	-6%
Nov-23	-2%	5%	6%	-20%	-1%	-6%
Dec-23	-6%	4%	5%	-22%	-2%	-7%

Source: BofA Global Research, Flightradar24

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Exhibit 164: GENX monthly engine hours growth vs 2019

Europe was the best-performing region as of December 2023

	Africa	Europe	North America	Latin America	Middle East	APAC
Jan-20	35%	28%	26%	33%	16%	15%
Feb-20	44%	21%	11%	38%	7%	-16%
Mar-20	15%	-4%	-9%	10%	-20%	-41%
Apr-20	-79%	-77%	-74%	-90%	-86%	-77%
May-20	-67%	-70%	-59%	-76%	-86%	-67%
Jun-20	-60%	-64%	-55%	-62%	-77%	-54%
Jul-20	-53%	-56%	-46%	-55%	-66%	-53%
Aug-20	-46%	-50%	-40%	-49%	-58%	-47%
Sep-20	-40%	-42%	-38%	-47%	-47%	-47%
Oct-20	-31%	-36%	-34%	-39%	-43%	-46%
Nov-20	-35%	-26%	-26%	-19%	-44%	-39%
Dec-20	-33%	-30%	-26%	-5%	-48%	-42%
Jan-21	-7%	-16%	-14%	35%	-33%	-44%
Feb-21	-6%	-9%	-15%	28%	-25%	-48%
Mar-21	-12%	-4%	-8%	33%	-18%	-32%
Apr-21	-10%	-7%	-12%	26%	-18%	-24%
May-21	-8%	-17%	-17%	15%	-20%	-27%
Jun-21	1%	-24%	-6%	3%	-16%	-33%
Jul-21	2%	-22%	-1%	2%	-11%	-35%
Aug-21	1%	-21%	0%	1%	-7%	-40%
Sep-21	5%	-13%	-5%	9%	-5%	-38%
Oct-21	4%	-6%	-5%	16%	-1%	-34%
Nov-21	3%	-2%	7%	35%	-7%	-37%
Dec-21	-6%	-2%	9%	31%	-7%	-37%
Jan-22	21%	25%	30%	59%	4%	-30%
Feb-22	34%	16%	26%	67%	-3%	-32%
Mar-22	42%	21%	24%	78%	6%	-31%
Apr-22	30%	32%	20%	68%	11%	-29%
May-22	31%	32%	19%	48%	17%	-28%
Jun-22	37%	26%	20%	32%	14%	-27%
Jul-22	32%	22%	17%	27%	19%	-26%
Aug-22	25%	20%	15%	34%	14%	-23%
Sep-22	26%	21%	12%	29%	11%	-28%
Oct-22	29%	21%	11%	25%	13%	-27%
Nov-22	10%	16%	13%	12%	8%	-23%
Dec-22	22%	17%	14%	14%	10%	-23%
Jan-23	60%	50%	47%	50%	33%	-7%
Feb-23	63%	49%	43%	50%	28%	-8%
Mar-23	63%	50%	39%	56%	28%	-8%
Apr-23	54%	49%	28%	49%	27%	-3%
May-23	51%	49%	25%	48%	32%	-7%
Jun-23	59%	48%	28%	40%	30%	-3%
Jul-23	56%	43%	28%	31%	28%	2%
Aug-23	48%	40%	29%	34%	23%	14%
Sep-23	59%	41%	28%	33%	25%	8%
Oct-23	64%	45%	27%	34%	28%	6%
Nov-23	43%	38%	32%	22%	21%	3%
Dec-23	36%	37%	30%	22%	18%	5%

Source: BofA Global Research, Flightradar24

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Exhibit 165: PW100 monthly engine hours growth vs 2019

Africa was the strongest region of growth as of December 2023

	PW100 Monthly Data vs 2019					
	Africa	Europe	North America	Latin America	Middle East	APAC
Jan-20	39%	3%	24%	29%	17%	30%
Feb-20	14%	9%	28%	30%	-3%	29%
Mar-20	-13%	-24%	13%	5%	7%	7%
Apr-20	-93%	-85%	-74%	-91%	16%	-81%
May-20	-91%	-82%	-76%	-89%	60%	-82%
Jun-20	-83%	-72%	-65%	-82%	47%	-59%
Jul-20	-58%	-51%	-52%	-77%	9%	-48%
Aug-20	-31%	-41%	-50%	-60%	14%	-44%
Sep-20	-16%	-44%	-50%	-52%	24%	-43%
Oct-20	-16%	-44%	-53%	-46%	-3%	-43%
Nov-20	-7%	-44%	-53%	-37%	-14%	-41%
Dec-20	-1%	-42%	-45%	-33%	-41%	-40%
Jan-21	63%	-45%	-35%	-4%	-5%	-20%
Feb-21	22%	-48%	-36%	-15%	-17%	-20%
Mar-21	13%	-48%	-25%	-16%	-8%	-16%
Apr-21	18%	-45%	-29%	-35%	7%	-19%
May-21	24%	-41%	-31%	-26%	13%	-34%
Jun-21	41%	-34%	-30%	-19%	13%	-31%
Jul-21	42%	-26%	-23%	-18%	-11%	-33%
Aug-21	44%	-22%	-22%	-6%	-13%	-39%
Sep-21	50%	-17%	-22%	-12%	-15%	-42%
Oct-21	56%	-14%	-20%	-13%	-27%	-30%
Nov-21	58%	-10%	-22%	-13%	-23%	-23%
Dec-21	38%	-12%	-21%	-15%	-47%	-18%
Jan-22	126%	-18%	-10%	-3%	-40%	2%
Feb-22	96%	-14%	-13%	3%	-47%	-5%
Mar-22	53%	-14%	-9%	10%	-38%	4%
Apr-22	50%	-3%	-7%	11%	-27%	10%
May-22	61%	1%	-10%	24%	-14%	19%
Jun-22	56%	7%	-13%	2%	-38%	18%
Jul-22	67%	13%	-8%	5%	-71%	8%
Aug-22	78%	15%	-8%	7%	-53%	2%
Sep-22	74%	12%	-10%	0%	-45%	1%
Oct-22	56%	14%	-9%	-3%	-60%	-1%
Nov-22	75%	12%	-7%	-11%	-40%	-2%
Dec-22	75%	9%	-10%	-9%	-32%	0%
Jan-23	159%	12%	13%	19%	-11%	33%
Feb-23	100%	13%	9%	11%	-28%	28%
Mar-23	87%	11%	3%	17%	-33%	31%
Apr-23	93%	19%	-1%	11%	36%	28%
May-23	112%	20%	-1%	16%	32%	37%
Jun-23	89%	20%	-6%	8%	48%	35%
Jul-23	84%	26%	-3%	17%	60%	21%
Aug-23	103%	26%	1%	21%	65%	16%
Sep-23	111%	24%	5%	13%	50%	15%
Oct-23	117%	25%	-2%	7%	48%	10%
Nov-23	106%	23%	-8%	-5%	45%	9%
Dec-23	93%	19%	-13%	-5%	19%	6%

Source: BofA Global Research, Flightradar24

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Exhibit 166: PW2000 monthly engine hours growth vs 2019

Latam remained the best-performing region in December 2023

PW2000 Monthly Data vs 2019

	Africa	Europe	North America	Latin America	Middle East	APAC
Jan-20	-9%	-14%	10%	25%	-20%	16%
Feb-20	4%	-5%	8%	17%	-6%	10%
Mar-20	89%	-14%	-9%	-15%	-16%	-34%
Apr-20	10%	-50%	-68%	-91%	-22%	-82%
May-20	-34%	-62%	-73%	-85%	-11%	-60%
Jun-20	-20%	-65%	-70%	-90%	-7%	-43%
Jul-20	-6%	-65%	-62%	-86%	-19%	-31%
Aug-20	-15%	-62%	-50%	-66%	50%	-45%
Sep-20	-30%	-50%	-44%	-59%	71%	-20%
Oct-20	-14%	-35%	-40%	-61%	54%	-50%
Nov-20	59%	-9%	-30%	-36%	36%	-58%
Dec-20	-59%	-18%	-24%	-25%	32%	-50%
Jan-21	-15%	-29%	-23%	-23%	22%	-57%
Feb-21	1%	-24%	-28%	-28%	29%	-64%
Mar-21	88%	-20%	-27%	-41%	37%	-62%
Apr-21	3%	-24%	-25%	-65%	47%	-60%
May-21	-38%	-46%	-26%	-76%	112%	-34%
Jun-21	-23%	-49%	-30%	-64%	36%	-15%
Jul-21	-6%	-42%	-31%	-59%	37%	-4%
Aug-21	14%	-39%	-28%	-54%	125%	-19%
Sep-21	2%	-37%	-22%	-49%	133%	-37%
Oct-21	24%	-26%	-26%	-51%	93%	-38%
Nov-21	-40%	-10%	-20%	-42%	219%	-47%
Dec-21	43%	-11%	-21%	-33%	262%	-49%
Jan-22	-2%	-27%	-18%	-21%	115%	-48%
Feb-22	-1%	-38%	-18%	-41%	75%	-65%
Mar-22	82%	-45%	-21%	-44%	63%	-66%
Apr-22	-2%	-34%	-27%	-48%	7%	-64%
May-22	-37%	-49%	-29%	-53%	-6%	-48%
Jun-22	-25%	-52%	-36%	-37%	-10%	-29%
Jul-22	-8%	-49%	-31%	-33%	-20%	-27%
Aug-22	-14%	-50%	-34%	-36%	21%	-46%
Sep-22	-25%	-50%	-27%	-43%	27%	-41%
Oct-22	12%	-49%	-31%	-50%	8%	-46%
Nov-22	289%	-40%	-26%	-53%	-2%	-66%
Dec-22	-54%	-36%	-24%	-30%	10%	-73%
Jan-23	-16%	-42%	-17%	-28%	-14%	-78%
Feb-23	2%	-48%	-21%	-78%	-8%	-90%
Mar-23	93%	-50%	-24%	-75%	-6%	-88%
Apr-23	-9%	-48%	-27%	-51%	3%	-92%
May-23	-36%	-55%	-28%	-13%	-2%	-94%
Jun-23	-29%	-53%	-30%	-20%	-14%	-86%
Jul-23	-11%	-54%	-29%	-18%	-26%	-79%
Aug-23	-97%	-53%	-30%	-11%	5%	-79%
Sep-23	-100%	-52%	-24%	-11%	25%	-62%
Oct-23	-100%	-51%	-26%	-16%	-52%	-73%
Nov-23	-100%	-56%	-25%	-11%	-100%	-82%
Dec-23	-100%	-59%	-23%	4%	-100%	-69%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH



Exhibit 167: PW4000 monthly engine hours growth vs 2019

Middle East remained the best-performing region in December 2023

	PW4000 Monthly Data vs 2019					
	Africa	Europe	North America	Latin America	Middle East	APAC
Jan-20	38%	9%	13%	-41%	30%	-7%
Feb-20	13%	14%	21%	-39%	14%	-29%
Mar-20	-22%	-15%	-4%	-49%	-53%	-62%
Apr-20	-87%	-78%	-55%	-68%	-75%	-76%
May-20	-81%	-73%	-58%	-78%	-71%	-72%
Jun-20	-80%	-77%	-57%	-77%	-62%	-67%
Jul-20	-78%	-83%	-61%	-76%	-78%	-66%
Aug-20	-73%	-80%	-60%	-72%	-84%	-61%
Sep-20	-74%	-77%	-57%	-69%	-82%	-58%
Oct-20	-78%	-74%	-54%	-70%	-75%	-55%
Nov-20	-69%	-68%	-43%	-22%	-64%	-51%
Dec-20	-60%	-65%	-40%	4%	-64%	-53%
Jan-21	-52%	-71%	-42%	-44%	-66%	-67%
Feb-21	-60%	-71%	-45%	-51%	-67%	-69%
Mar-21	-56%	-69%	-36%	-51%	-58%	-57%
Apr-21	-56%	-67%	-27%	-52%	-62%	-53%
May-21	-59%	-62%	-18%	-63%	-60%	-52%
Jun-21	-56%	-62%	-18%	-67%	-65%	-56%
Jul-21	-50%	-49%	-12%	-59%	-72%	-56%
Aug-21	-42%	-43%	-7%	-39%	-68%	-62%
Sep-21	-56%	-42%	2%	-61%	-65%	-55%
Oct-21	-50%	-35%	-4%	-65%	-61%	-48%
Nov-21	-56%	-35%	1%	-57%	-58%	-55%
Dec-21	-51%	-30%	5%	2%	-38%	-54%
Jan-22	-39%	-39%	3%	-22%	-58%	-61%
Feb-22	-57%	-44%	-7%	-22%	-62%	-60%
Mar-22	-67%	-35%	-2%	-17%	-44%	-57%
Apr-22	-65%	-27%	5%	-36%	-50%	-60%
May-22	-71%	-24%	-2%	-44%	-55%	-60%
Jun-22	-67%	-23%	-6%	-49%	-49%	-57%
Jul-22	-70%	-17%	-8%	-54%	-49%	-56%
Aug-22	-76%	-18%	-15%	-51%	-55%	-52%
Sep-22	-76%	-19%	-18%	-45%	-39%	-51%
Oct-22	-71%	-32%	-21%	-53%	-8%	-46%
Nov-22	-65%	-34%	-18%	-39%	-8%	-44%
Dec-22	-56%	-31%	-17%	-14%	16%	-42%
Jan-23	-63%	-38%	-18%	-40%	4%	-44%
Feb-23	-57%	-35%	-21%	-33%	-1%	-41%
Mar-23	-59%	-33%	-23%	-39%	10%	-39%
Apr-23	-54%	-32%	-17%	-40%	25%	-36%
May-23	-67%	-30%	-16%	-46%	29%	-37%
Jun-23	-55%	-32%	-19%	-38%	62%	-36%
Jul-23	-58%	-30%	-21%	-33%	26%	-33%
Aug-23	-60%	-27%	-20%	-29%	-10%	-27%
Sep-23	-61%	-28%	-20%	-29%	-13%	-28%
Oct-23	-58%	-34%	-20%	-37%	30%	-25%
Nov-23	-52%	-40%	-23%	-41%	28%	-27%
Dec-23	-54%	-35%	-21%	-2%	58%	-27%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH



Exhibit 168: TRENT monthly engine hours growth vs 2019

Latin America exhibited the strongest growth in December 2023

	Africa	Europe	North America	Latin America	Middle East	APAC
Jan-20	35%	20%	16%	24%	14%	17%
Feb-20	37%	8%	9%	19%	13%	-15%
Mar-20	0%	-24%	-17%	-2%	-30%	-49%
Apr-20	-83%	-82%	-83%	-82%	-76%	-82%
May-20	-74%	-72%	-78%	-72%	-67%	-79%
Jun-20	-69%	-74%	-78%	-71%	-62%	-74%
Jul-20	-62%	-74%	-73%	-71%	-61%	-70%
Aug-20	-58%	-71%	-70%	-68%	-63%	-65%
Sep-20	-60%	-68%	-67%	-62%	-59%	-63%
Oct-20	-54%	-66%	-63%	-57%	-50%	-61%
Nov-20	-55%	-57%	-54%	-55%	-49%	-57%
Dec-20	-50%	-57%	-51%	-53%	-50%	-60%
Jan-21	-34%	-54%	-45%	-44%	-36%	-58%
Feb-21	-34%	-52%	-45%	-48%	-38%	-62%
Mar-21	-38%	-51%	-42%	-52%	-35%	-51%
Apr-21	-26%	-51%	-42%	-47%	-32%	-47%
May-21	-30%	-54%	-41%	-50%	-31%	-47%
Jun-21	-26%	-55%	-37%	-48%	-32%	-52%
Jul-21	-23%	-50%	-34%	-42%	-31%	-51%
Aug-21	-26%	-47%	-33%	-42%	-34%	-55%
Sep-21	-32%	-44%	-31%	-36%	-30%	-49%
Oct-21	-29%	-39%	-27%	-33%	-30%	-45%
Nov-21	-33%	-29%	-13%	-31%	-34%	-50%
Dec-21	-39%	-28%	-11%	-26%	-34%	-51%
Jan-22	-20%	-16%	-1%	-15%	-30%	-47%
Feb-22	-17%	-23%	-5%	-18%	-27%	-50%
Mar-22	-13%	-24%	-6%	-12%	-23%	-50%
Apr-22	-10%	-19%	-7%	1%	-22%	-52%
May-22	-9%	-20%	-7%	1%	-21%	-51%
Jun-22	-2%	-17%	-7%	5%	-24%	-48%
Jul-22	3%	-17%	-6%	-1%	-16%	-47%
Aug-22	-1%	-16%	-4%	-6%	-20%	-44%
Sep-22	-3%	-14%	-4%	0%	-15%	-43%
Oct-22	0%	-15%	-1%	-1%	-16%	-43%
Nov-22	3%	-13%	5%	8%	-17%	-42%
Dec-22	3%	-13%	1%	5%	-14%	-41%
Jan-23	33%	4%	20%	24%	2%	-26%
Feb-23	32%	1%	17%	18%	5%	-25%
Mar-23	36%	-1%	15%	25%	3%	-25%
Apr-23	36%	0%	10%	26%	1%	-22%
May-23	36%	1%	5%	22%	5%	-25%
Jun-23	38%	2%	3%	21%	6%	-24%
Jul-23	27%	5%	8%	14%	12%	-20%
Aug-23	21%	8%	10%	12%	6%	-7%
Sep-23	14%	8%	11%	17%	9%	-8%
Oct-23	26%	9%	12%	22%	8%	-10%
Nov-23	27%	13%	14%	29%	1%	-11%
Dec-23	20%	13%	13%	20%	-1%	-12%

Source: BofA Global Research, Flightradar24

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Quarterly flight cycles data tables

Exhibit 169: Major engines quarterly average flight cycles yoy growth

CFM LEAP family was the best performer in 4Q23

	CFM56 -5B (A320)	CFM56 -7B (737NG)	CFM56 family	CFMLEAP	V2500	GTF family	Rolls-Royce commercial	P&W	GE
1Q20	-16%	-15%	-15%	-7%	-14%	57%	-10%	-3%	-3%
2Q20	-82%	-76%	-78%	-66%	-87%	-59%	-73%	-78%	-62%
3Q20	-53%	-47%	-50%	-18%	-64%	-13%	-60%	-53%	-45%
4Q20	-52%	-43%	-47%	-16%	-62%	-4%	-49%	-46%	-34%
1Q21	-43%	-37%	-39%	-9%	-57%	9%	-40%	-39%	-27%
2Q21	195%	164%	170%	334%	239%	237%	118%	172%	93%
3Q21	29%	31%	31%	124%	45%	71%	48%	45%	47%
4Q21	28%	26%	26%	122%	48%	62%	26%	43%	28%
1Q22	25%	29%	27%	122%	55%	54%	26%	43%	21%
2Q22	19%	13%	15%	97%	56%	73%	12%	52%	17%
3Q22	16%	10%	12%	63%	33%	45%	21%	36%	7%
4Q22	6%	1%	2%	49%	27%	21%	9%	21%	1%
1Q23	26%	19%	21%	61%	29%	32%	37%	27%	13%
2Q23	23%	19%	20%	57%	7%	18%	44%	13%	10%
3Q23	17%	15%	15%	54%	7%	19%	36%	12%	11%
4Q23	22%	20%	20%	49%	5%	14%	37%	9%	12%
Vs2019									
1Q21 vs 1Q19	-51%	-46%	-48%	-16%	-63%	71%	-45%	-41%	-29%
2Q21 vs 2Q19	-47%	-38%	-41%	46%	-56%	39%	-41%	-39%	-26%
3Q21 vs 3Q19	-39%	-31%	-34%	84%	-48%	49%	-41%	-32%	-20%
4Q21 vs 4Q19	-39%	-29%	-33%	88%	-44%	56%	-35%	-23%	-16%
1Q22 vs 1Q19	-39%	-31%	-34%	88%	-43%	163%	-31%	-16%	-14%
2Q22 vs 2Q19	-37%	-29%	-32%	187%	-32%	142%	-33%	-8%	-13%
3Q22 vs 3Q19	-30%	-24%	-27%	199%	-31%	116%	-29%	-8%	-14%
4Q22 vs 4Q19	-35%	-28%	-31%	179%	-29%	89%	-29%	-7%	-15%
1Q23 vs 1Q19	-24%	-17%	-20%	202%	-27%	247%	-6%	7%	-3%
2Q23 vs 2Q19	-22%	-16%	-19%	350%	-27%	184%	-4%	4%	-4%
3Q23 vs 3Q19	-18%	-12%	-15%	360%	-26%	157%	-3%	3%	-5%
4Q23 vs 4Q19	-21%	-14%	-17%	316%	-25%	116%	-3%	1%	-5%

Source: BofA Global Research, Flightradar24

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Exhibit 170: P&W engine quarterly average flight cycles yoy growth

PW1900G was the best-performing P&W engine throughout 4Q23

	GP7200	V2500	PW100	PW1100G	PW1500G	PW1900G	PW2000	PW4000	JT3D	JT8D	JT9D	Total P&W
1Q20	-10%	-14%	7%	56%	39%	337%	-1%	-19%	n.a	-50%	-65%	-3%
2Q20	-100%	-87%	-76%	-60%	-61%	29%	-53%	-62%	n.a	-81%	-80%	-78%
3Q20	-97%	-64%	-51%	-13%	-21%	88%	-35%	-52%	n.a	-80%	-80%	-53%
4Q20	-94%	-62%	-46%	3%	-41%	27%	-20%	-42%	n.a	-59%	-54%	-46%
1Q21	-93%	-57%	-39%	18%	-38%	-9%	-18%	-42%	n.a	-45%	162%	-39%
2Q21	3579%	239%	147%	256%	151%	193%	76%	51%	n.a	26%	439%	172%
3Q21	384%	45%	28%	67%	71%	160%	29%	17%	n.a	40%	22%	45%
4Q21	447%	48%	37%	51%	144%	147%	8%	4%	n.a	3%	-6%	43%
1Q22	562%	55%	33%	41%	162%	138%	8%	11%	n.a	-13%	-74%	43%
2Q22	374%	56%	55%	65%	119%	127%	-4%	-11%	n.a	-3%	-68%	52%
3Q22	217%	33%	50%	44%	47%	43%	2%	-3%	n.a	-9%	-8%	36%
4Q22	92%	27%	24%	18%	34%	36%	-4%	-3%	n.a	-12%	-52%	21%
1Q23	71%	29%	24%	29%	40%	60%	3%	24%	n.a	-8%	-98%	27%
2Q23	59%	7%	14%	14%	30%	44%	0%	41%	n.a	-6%	-98%	13%
3Q23	56%	7%	10%	15%	27%	58%	-7%	32%	n.a	-3%	-89%	12%
4Q23	30%	5%	7%	10%	24%	60%	-1%	25%	n.a	-12%	338%	9%
Vs2019												
1Q21 vs 1Q19	-94%	-63%	-35%	85%	-14%	296%	-19%	-52%	n.a	-73%	-8%	-41%
2Q21 vs 2Q19	-90%	-56%	-40%	44%	-1%	280%	-18%	-42%	n.a	-76%	6%	-39%
3Q21 vs 3Q19	-84%	-48%	-37%	46%	35%	390%	-16%	-44%	n.a	-72%	-76%	-32%
4Q21 vs 4Q19	-68%	-44%	-26%	55%	44%	212%	-14%	-40%	n.a	-58%	-57%	-23%
1Q22 vs 1Q19	-59%	-43%	-13%	161%	125%	842%	-13%	-47%	n.a	-76%	-76%	-16%
2Q22 vs 2Q19	-51%	-32%	-8%	138%	116%	762%	-21%	-49%	n.a	-77%	-66%	-8%
3Q22 vs 3Q19	-50%	-31%	-6%	111%	99%	601%	-15%	-46%	n.a	-75%	-78%	-8%
4Q22 vs 4Q19	-39%	-29%	-8%	82%	93%	326%	-17%	-42%	n.a	-63%	-79%	-7%
1Q23 vs 1Q19	-30%	-27%	7%	238%	215%	1410%	-10%	-34%	n.a	-78%	-100%	7%
2Q23 vs 2Q19	-22%	-27%	6%	170%	182%	1138%	-22%	-27%	n.a	-78%	-99%	4%
3Q23 vs 3Q19	-22%	-26%	4%	143%	153%	1006%	-20%	-28%	n.a	-76%	-98%	3%
4Q23 vs 4Q19	-21%	-25%	-2%	100%	140%	581%	-18%	-28%	n.a	-67%	-10%	1%

Source: BofA Global Research, Flightradar24

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Exhibit 171: GE engine quarterly average flight cycles yoy growth

Genx-1B was the strongest performer through 4Q23

	CF34	CF6	GE90	Genx-1B	Genx-2B	Total GE
1Q20	-1%	1%	-11%	-5%	5%	-3%
2Q20	-76%	-35%	-55%	-66%	-11%	-62%
3Q20	-52%	-33%	-47%	-43%	-12%	-45%
4Q20	-42%	-24%	-34%	-24%	-7%	-34%
1Q21	-34%	-22%	-27%	-8%	-1%	-27%
2Q21	201%	23%	49%	160%	8%	93%
3Q21	69%	23%	32%	47%	11%	47%
4Q21	43%	15%	18%	18%	10%	28%
1Q22	28%	15%	19%	18%	0%	21%
2Q22	21%	14%	21%	11%	-6%	17%
3Q22	3%	8%	18%	16%	-7%	7%
4Q22	0%	0%	7%	6%	-12%	1%
1Q23	16%	1%	15%	26%	0%	13%
2Q23	9%	-1%	19%	29%	7%	10%
3Q23	11%	-3%	17%	29%	6%	11%
4Q23	15%	-2%	17%	28%	7%	12%
Vs 2019						
1Q21 vs 1Q19	-35%	-21%	-35%	-13%	4%	-29%
2Q21 vs 2Q19	-29%	-21%	-33%	-11%	-4%	-26%
3Q21 vs 3Q19	-18%	-18%	-30%	-16%	-3%	-20%
4Q21 vs 4Q19	-18%	-12%	-22%	-10%	3%	-16%
1Q22 vs 1Q19	-17%	-9%	-23%	3%	5%	-14%
2Q22 vs 2Q19	-15%	-10%	-19%	-1%	-10%	-13%
3Q22 vs 3Q19	-16%	-11%	-17%	-2%	-10%	-14%
4Q22 vs 4Q19	-18%	-12%	-16%	-5%	-9%	-15%
1Q23 vs 1Q19	-3%	-9%	-11%	29%	5%	-3%
2Q23 vs 2Q19	-7%	-11%	-4%	27%	-4%	-4%
3Q23 vs 3Q19	-7%	-14%	-3%	27%	-4%	-5%
4Q23 vs 4Q19	-6%	-14%	-2%	22%	-3%	-5%

Source: BofA Global Research, Flightradar24

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Exhibit 172: Rolls Royce engine quarterly average flight cycles yoy growth

Rolls Royce's newest commercial platforms (Trent 1000, Trent 7000 and Trent XWB) outperformed the broader portfolio as of 4Q23

	RB211	Trent 500	Trent 700	Trent 800	Trent 900	Trent 1000	Trent 7000	Trent XWB	Total Rolls-Royce commercial
1Q20	28%	-40%	-29%	-10%	-21%	3%	957%	14%	-10%
2Q20	-61%	-83%	-79%	-88%	-97%	-67%	-36%	-58%	-73%
3Q20	-54%	-88%	-62%	-88%	-97%	-60%	-52%	-40%	-60%
4Q20	-41%	-84%	-52%	-81%	-97%	-43%	-33%	-27%	-49%
1Q21	-46%	-78%	-39%	-68%	-97%	-35%	-33%	-20%	-40%
2Q21	57%	5%	143%	195%	-13%	101%	352%	124%	118%
3Q21	44%	62%	24%	196%	-17%	81%	262%	50%	48%
4Q21	45%	84%	1%	120%	106%	44%	95%	32%	26%
1Q22	32%	43%	4%	31%	531%	48%	115%	30%	26%
2Q22	22%	29%	-21%	-12%	856%	47%	118%	27%	12%
3Q22	13%	28%	2%	-5%	1041%	39%	67%	32%	21%
4Q22	-9%	-3%	-7%	-12%	439%	24%	46%	23%	9%
1Q23	-3%	-1%	44%	16%	192%	32%	63%	47%	37%
2Q23	-2%	43%	72%	45%	90%	26%	41%	50%	44%
3Q23	-5%	23%	52%	43%	44%	18%	56%	48%	36%
4Q23	0%	41%	54%	35%	47%	19%	49%	47%	37%
Vs 2019									
1Q21 vs 1Q19	-31%	-87%	-56%	-71%	-98%	-33%	605%	-9%	-45%
2Q21 vs 2Q19	-39%	-82%	-48%	-65%	-97%	-33%	191%	-7%	-41%
3Q21 vs 3Q19	-34%	-80%	-53%	-64%	-97%	-27%	76%	-9%	-41%
4Q21 vs 4Q19	-15%	-70%	-52%	-58%	-93%	-18%	31%	-4%	-35%
1Q22 vs 1Q19	-9%	-81%	-55%	-62%	-86%	-1%	1417%	19%	-31%
2Q22 vs 2Q19	-26%	-77%	-59%	-69%	-76%	-2%	534%	19%	-33%
3Q22 vs 3Q19	-25%	-74%	-52%	-66%	-67%	1%	194%	20%	-29%
4Q22 vs 4Q19	-23%	-71%	-55%	-63%	-63%	2%	91%	17%	-29%
1Q23 vs 1Q19	-12%	-82%	-35%	-56%	-59%	31%	2375%	74%	-6%
2Q23 vs 2Q19	-27%	-67%	-30%	-55%	-53%	24%	796%	78%	-4%
3Q23 vs 3Q19	-29%	-69%	-27%	-51%	-52%	19%	358%	77%	-3%
4Q23 vs 4Q19	-23%	-59%	-31%	-50%	-46%	22%	184%	72%	-3%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH



Exhibit 173: Airbus aircraft quarterly average flight cycles yoy growth

Airbus' newest platforms (A320neo, A350, A220) outperformed legacy platforms (A320ceo, A330, A340, A380) as of 4Q23

	A320neo	A320ceo	A330	A340	A350	A380	A300	A220	Airbus total
1Q20	49%	-19%	-29%	-39%	14%	-16%	-8%	39%	-13%
2Q20	-63%	-84%	-79%	-85%	-58%	-99%	-4%	-61%	-80%
3Q20	-15%	-57%	-66%	-84%	-40%	-97%	-5%	-21%	-53%
4Q20	-4%	-55%	-53%	-76%	-27%	-95%	-1%	-41%	-48%
1Q21	5%	-46%	-42%	-66%	-20%	-94%	5%	-38%	-38%
2Q21	271%	206%	137%	75%	124%	549%	-2%	151%	199%
3Q21	73%	34%	46%	112%	50%	246%	-3%	71%	42%
4Q21	58%	35%	20%	93%	32%	367%	0%	144%	40%
1Q22	53%	34%	26%	64%	30%	545%	-5%	162%	39%
2Q22	59%	32%	6%	48%	27%	425%	0%	119%	37%
3Q22	42%	25%	17%	22%	32%	283%	-1%	47%	29%
4Q22	25%	14%	4%	-7%	23%	123%	-12%	34%	17%
1Q23	40%	29%	37%	6%	47%	87%	-16%	40%	32%
2Q23	33%	21%	47%	22%	50%	65%	-20%	30%	26%
3Q23	34%	17%	39%	28%	48%	53%	-20%	27%	23%
4Q23	30%	19%	38%	52%	47%	34%	-16%	24%	23%
Vs 2019									
1Q21 vs 1Q19	56%	-56%	-59%	-79%	-9%	-95%	-3%	-14%	-46%
2Q21 vs 2Q19	37%	-51%	-51%	-73%	-7%	-92%	-6%	-1%	-42%
3Q21 vs 3Q19	47%	-43%	-51%	-67%	-9%	-89%	-8%	35%	-34%
4Q21 vs 4Q19	51%	-39%	-44%	-53%	-4%	-76%	0%	44%	-28%
1Q22 vs 1Q19	139%	-41%	-48%	-66%	19%	-68%	-8%	125%	-25%
2Q22 vs 2Q19	118%	-35%	-48%	-61%	19%	-61%	-6%	116%	-20%
3Q22 vs 3Q19	109%	-29%	-42%	-60%	20%	-57%	-9%	99%	-14%
4Q22 vs 4Q19	88%	-31%	-42%	-56%	17%	-47%	-12%	93%	-16%
1Q23 vs 1Q19	234%	-24%	-29%	-64%	74%	-40%	-22%	215%	-1%
2Q23 vs 2Q19	189%	-21%	-23%	-52%	78%	-35%	-24%	182%	1%
3Q23 vs 3Q19	179%	-16%	-20%	-48%	77%	-34%	-27%	153%	5%
4Q23 vs 4Q19	145%	-18%	-20%	-33%	72%	-30%	-26%	140%	4%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 174: Boeing aircraft quarterly average flight cycles yoy growth

787 exhibited the strongest performance in 4Q23

	737	Org/Classic	737NG	747	757	767	777	787	717	Boeing Total
1Q20	-4%	-15%	-9%	-4%	-1%	-15%	-2%	-2%	-15%	
2Q20	-58%	-76%	-21%	-61%	-41%	-62%	-66%	-78%	-71%	
3Q20	-49%	-47%	-23%	-47%	-37%	-54%	-48%	-57%	-47%	
4Q20	-23%	-43%	-13%	-32%	-26%	-42%	-30%	-59%	-41%	
1Q21	-12%	-37%	-3%	-27%	-25%	-34%	-17%	-52%	-33%	
2Q21	67%	164%	9%	79%	35%	50%	140%	117%	127%	
3Q21	34%	31%	10%	36%	34%	32%	55%	20%	37%	
4Q21	17%	26%	4%	20%	24%	18%	25%	40%	31%	
1Q22	10%	29%	-3%	19%	25%	18%	26%	36%	33%	
2Q22	9%	13%	-9%	6%	15%	20%	22%	38%	20%	
3Q22	3%	10%	-12%	10%	8%	20%	24%	32%	16%	
4Q22	-8%	1%	-15%	-1%	1%	11%	13%	31%	7%	
1Q23	-9%	19%	-10%	5%	5%	20%	29%	22%	22%	
2Q23	-11%	19%	-1%	2%	4%	25%	29%	6%	22%	
3Q23	-8%	15%	1%	-6%	3%	21%	27%	4%	20%	
4Q23	-15%	20%	3%	-1%	3%	19%	25%	4%	22%	
Vs 2019										
1Q21 vs 1Q19	-16%	-46%	-12%	-30%	-26%	-44%	-19%	-53%	-43%	
2Q21 vs 2Q19	-29%	-38%	-14%	-31%	-20%	-42%	-18%	-51%	-34%	
3Q21 vs 3Q19	-31%	-31%	-15%	-28%	-16%	-39%	-19%	-48%	-27%	
4Q21 vs 4Q19	-10%	-29%	-10%	-18%	-9%	-32%	-12%	-42%	-22%	
1Q22 vs 1Q19	-7%	-31%	-15%	-17%	-8%	-33%	2%	-36%	-24%	
2Q22 vs 2Q19	-23%	-29%	-22%	-27%	-9%	-31%	0%	-33%	-21%	
3Q22 vs 3Q19	-29%	-24%	-25%	-21%	-9%	-27%	0%	-31%	-16%	
4Q22 vs 4Q19	-17%	-28%	-23%	-18%	-8%	-24%	0%	-24%	-17%	
1Q23 vs 1Q19	-15%	-17%	-23%	-13%	-3%	-20%	32%	-22%	-7%	
2Q23 vs 2Q19	-32%	-16%	-23%	-25%	-5%	-14%	28%	-29%	-3%	
3Q23 vs 3Q19	-34%	-12%	-25%	-25%	-7%	-12%	27%	-29%	1%	
4Q23 vs 4Q19	-29%	-14%	-21%	-20%	-4%	-10%	25%	-21%	1%	

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH



Exhibit 175: Other airframe quarterly average flight cycles yoy growth

Airbus A220 exhibited the strongest performance in 4Q23

	ATR family	Embraer 135/145	Embraer E-Jet Family	Airbus A220	MD-11	MD-80	MD-90
1Q20	7%	1%	-5%	39%	-9%	-56%	-41%
2Q20	-75%	-75%	-85%	-61%	-3%	-87%	-96%
3Q20	-49%	-63%	-65%	-21%	1%	-88%	-100%
4Q20	-46%	-64%	-57%	-41%	1%	-74%	-100%
1Q21	-38%	-53%	-50%	-38%	1%	-63%	-100%
2Q21	144%	120%	241%	151%	1%	-1%	-98%
3Q21	30%	56%	85%	71%	-2%	52%	500%
4Q21	37%	58%	57%	144%	-3%	14%	-100%
1Q22	33%	24%	46%	162%	-4%	-11%	-100%
2Q22	54%	3%	43%	119%	-6%	16%	-85%
3Q22	50%	-8%	14%	47%	-5%	-4%	-100%
4Q22	24%	-17%	8%	34%	-10%	-9%	
1Q23	24%	-11%	21%	40%	-10%	3%	
2Q23	15%	-12%	10%	30%	-21%	-3%	-50%
3Q23	12%	-11%	10%	27%	-23%	3%	
4Q23	7%	-2%	10%	24%	-21%	-4%	-100%
Vs 2019							
1Q21 vs 1Q19	-34%	-53%	-53%	-14%	-9%	-83%	-100%
2Q21 vs 2Q19	-38%	-44%	-48%	-1%	-3%	-87%	-100%
3Q21 vs 3Q19	-34%	-42%	-35%	35%	-1%	-82%	-100%
4Q21 vs 4Q19	-25%	-44%	-33%	44%	-2%	-70%	-100%
1Q22 vs 1Q19	-13%	-41%	-31%	125%	-12%	-85%	-100%
2Q22 vs 2Q19	-5%	-42%	-25%	116%	-9%	-85%	-100%
3Q22 vs 3Q19	-1%	-47%	-26%	99%	-6%	-83%	-100%
4Q22 vs 4Q19	-8%	-53%	-28%	93%	-12%	-73%	-100%
1Q23 vs 1Q19	8%	-48%	-16%	215%	-21%	-85%	-99%
2Q23 vs 2Q19	9%	-49%	-18%	182%	-28%	-86%	-100%
3Q23 vs 3Q19	11%	-52%	-19%	153%	-28%	-82%	-100%
4Q23 vs 4Q19	-2%	-54%	-21%	140%	-30%	-74%	-100%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 176: Europe airlines quarterly average flight cycles yoy growth

SWISS daily cycles were the strongest of major European airlines in 4Q23

	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
Aer Lingus	-8%	-89%	-81%	-84%	-88%	5%	88%	263%	550%	681%	128%	54%	25%	5%	9%	5%
Air France	-12%	-89%	-47%	-62%	-54%	243%	25%	99%	83%	115%	33%	14%	16%	0%	-5%	-4%
Air-France KLM	-11%	-89%	-47%	-56%	-56%	276%	41%	85%	107%	116%	22%	12%	15%	3%	4%	6%
Austrian Air	-27%	-97%	-70%	-77%	-75%	1096%	97%	142%	147%	139%	38%	42%	58%	20%	10%	7%
British Airways	-18%	-93%	-75%	-74%	-86%	93%	37%	97%	404%	446%	114%	66%	55%	8%	13%	4%
Brussels Airlines	-8%	-98%	-76%	-84%	-84%	961%	169%	309%	299%	201%	34%	23%	51%	15%	2%	5%
Buzz (Ryanair)	86%	-96%	-1%	-52%	-87%	1485%	78%	283%	1039%	309%	51%	7%	12%	10%	9%	11%
Easyjet	-15%	-99%	-61%	-83%	-88%	1228%	44%	251%	544%	441%	49%	30%	21%	7%	13%	16%
Edelweiss Air	-13%	-95%	-39%	-64%	-73%	767%	36%	137%	189%	130%	42%	38%	57%	11%	13%	22%
Eurowings	-23%	-89%	-44%	-63%	-80%	190%	39%	143%	312%	211%	23%	10%	21%	-14%	-7%	-15%
Germanwings	3%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	n.a.	n.a.	n.a.	n.a.	n.a.	2300%	-50%	8%
IAG	-13%	-94%	-69%	-74%	-80%	313%	75%	137%	300%	247%	60%	46%	44%	5%	5%	6%
Iberia	-6%	-95%	-66%	-67%	-60%	846%	114%	135%	148%	108%	35%	29%	22%	9%	9%	8%
KLM	-8%	-87%	-50%	-48%	-53%	236%	49%	51%	85%	89%	15%	1%	9%	4%	7%	17%
LEVEL	57%	-100%	-100%	-100%	-100%	-100%	n.a.									
Lufthansa	-17%	-91%	-70%	-75%	-78%	210%	79%	163%	211%	178%	41%	15%	22%	-1%	10%	11%
Lufthansa Group	-17%	-93%	-69%	-76%	-80%	268%	78%	169%	228%	180%	33%	16%	26%	0%	6%	7%
Norwegian	36%	-88%	-65%	-78%	-90%	20%	69%	-96%	-100%	-100%	-100%	n.a.	n.a.	n.a.	n.a.	n.a.
Ryanair	8%	-96%	-46%	-72%	-90%	564%	44%	203%	723%	340%	31%	12%	22%	7%	12%	9%
SWISS	-14%	-92%	-67%	-79%	-82%	232%	87%	213%	289%	190%	15%	1%	12%	-4%	4%	23%
Transavia	-18%	-95%	-40%	-62%	-75%	662%	54%	178%	374%	186%	17%	33%	25%	6%	17%	4%
Turkish Air	-13%	-85%	-55%	-50%	-41%	317%	106%	87%	66%	73%	17%	15%	33%	18%	10%	11%
Vueling	-13%	-97%	-59%	-73%	-82%	871%	85%	172%	359%	190%	30%	34%	57%	1%	-4%	7%
Wizz Air	3%	-86%	-28%	-66%	-73%	206%	27%	160%	225%	185%	29%	19%	21%	-30%	-35%	-26%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH



Exhibit 177: North America airlines quarterly average flight cycles yoy growth

Frontier Airlines cycles were strongest of major US carriers in 4Q23

	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
Air Canada	7%	-71%	-63%	-61%	-67%	40%	98%	116%	162%	197%	70%	36%	33%	15%	9%	14%
Alaska	5%	-72%	-57%	-44%	-36%	188%	89%	51%	37%	17%	14%	10%	12%	9%	13%	7%
Allegiant	4%	-50%	-13%	-18%	-1%	108%	26%	32%	10%	2%	-4%	-4%	2%	2%	0%	7%
American Airlines	5%	-67%	-44%	-49%	-39%	171%	70%	77%	57%	18%	12%	10%	14%	12%	9%	4%
Delta	19%	-75%	-47%	-36%	-32%	233%	69%	44%	36%	23%	14%	11%	12%	14%	14%	11%
Frontier Airlines	30%	-72%	-45%	-39%	-33%	300%	90%	78%	58%	11%	7%	6%	11%	11%	14%	21%
Hawaiian	5%	-81%	-69%	-62%	-54%	252%	176%	115%	83%	29%	6%	8%	17%	9%	8%	9%
Jet Blue	-7%	-86%	-66%	-56%	-46%	403%	142%	88%	76%	24%	10%	13%	12%	7%	3%	0%
MESA Airlines	-6%	-70%	-53%	-44%	-36%	138%	56%	21%	-10%	-24%	-39%	-36%	-16%	-24%	-13%	-6%
Southwest	-4%	-55%	-33%	-41%	-37%	75%	33%	49%	49%	21%	15%	11%	16%	12%	8%	16%
Spirit	11%	-81%	-38%	-33%	-31%	394%	61%	57%	52%	17%	13%	18%	19%	19%	10%	12%
United Airlines	-6%	-85%	-67%	-51%	-42%	300%	143%	82%	73%	57%	23%	17%	23%	17%	21%	14%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 178: Asia Pacific airlines quarterly average flight cycles yoy growth

China Southern cycles were the strongest in APAC in 4Q23

	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
Air Asia	-13%	-97%	-75%	-89%	-91%	42%	-90%	135%	441%	913%	1919%	118%	71%	65%	41%	26%
Air China	-41%	-58%	-13%	-3%	36%	152%	-8%	-33%	-26%	-65%	-26%	-40%	52%	180%	113%	198%
Air India	-5%	-87%	-69%	-51%	-31%	308%	78%	47%	15%	50%	46%	18%	25%	18%	13%	11%
Air New Zealand	3%	-74%	-40%	-22%	-23%	239%	1%	-20%	-3%	1%	54%	61%	28%	13%	6%	2%
ANA	11%	-69%	-40%	-32%	-55%	60%	-4%	0%	70%	86%	80%	55%	30%	12%	5%	1%
Cathay Pacific	-36%	-78%	-79%	-74%	-69%	-17%	38%	32%	-6%	15%	-4%	-3%	142%	148%	105%	93%
China Eastern	-48%	-60%	-6%	-11%	60%	182%	-14%	-22%	-32%	-75%	-29%	-50%	48%	236%	99%	195%
China Southern	-48%	-55%	-3%	1%	67%	136%	-12%	-32%	-31%	-65%	-32%	-48%	46%	136%	103%	208%
GoAir	14%	-96%	-79%	-49%	-31%	705%	115%	75%	19%	201%	67%	-26%	8%	-76%	-100%	-100%
Hainan Airlines	-54%	-55%	-19%	-6%	84%	118%	1%	-30%	-39%	-66%	-37%	-48%	69%	169%	110%	168%
Indigo	11%	-89%	-58%	-35%	-13%	393%	73%	48%	2%	120%	52%	13%	42%	13%	23%	19%
Japan Airlines	-4%	-65%	-45%	-43%	-63%	25%	-11%	26%	108%	93%	89%	28%	19%	7%	3%	5%
Korean Air	-25%	-59%	-56%	-49%	-36%	29%	22%	15%	18%	12%	9%	11%	24%	31%	37%	37%
Qantas	2%	-87%	-81%	-61%	-41%	510%	47%	4%	5%	3%	185%	113%	42%	9%	7%	2%
Shenzhen Airlines	-44%	-49%	-2%	2%	42%	86%	-20%	-28%	-34%	-61%	-17%	-46%	69%	150%	60%	144%
Sichuan Airlines	-41%	-49%	4%	2%	65%	139%	-9%	-28%	-28%	-53%	-28%	-36%	45%	99%	84%	128%
Singapore Airlines	4%	-80%	-75%	-64%	-48%	192%	159%	105%	79%	86%	68%	53%	37%	20%	18%	19%
Spicejet	24%	-80%	-60%	-37%	-14%	118%	18%	5%	-28%	75%	15%	-28%	-23%	-42%	-33%	-22%
Spring	-28%	-39%	17%	14%	59%	113%	-4%	-24%	-25%	-75%	-34%	-39%	6%	167%	63%	115%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 179: Middle East airlines quarterly average flight cycles yoy growth

Etihad cycles were the most resilient in 4Q23

	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
Emirates	-12%	-74%	-62%	-48%	-42%	117%	45%	27%	39%	44%	36%	23%	20%	23%	22%	14%
Etihad	1%	-79%	-63%	-54%	-48%	141%	43%	18%	17%	31%	30%	24%	26%	27%	30%	29%
Qatar	3%	-59%	-46%	-29%	-21%	89%	50%	19%	13%	21%	11%	4%	10%	16%	25%	28%
Saudi	-20%	-90%	-69%	-48%	-30%	529%	126%	64%	43%	30%	21%	10%	5%	0%	-1%	2%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH



Exhibit 180: LATAM airlines quarterly average flight cycles yoy growth

Avianca cycles were the most resilient in 4Q23

	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
Aeromexico	-1%	-82%	-56%	-35%	-20%	400%	147%	81%	42%	68%	39%	34%	45%	7%	14%	3%
Avianca	6%	-98%	-96%	-64%	-51%	3591%	1672%	113%	65%	75%	47%	30%	21%	15%	14%	31%
Azul	3%	-84%	-62%	-25%	-9%	390%	163%	45%	15%	61%	20%	7%	19%	3%	5%	2%
LATAM Airlines	-4%	-92%	-81%	-53%	-45%	522%	271%	73%	58%	91%	43%	23%	25%	20%	10%	10%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 181: Cargo airlines quarterly average flight cycles yoy growth

DHL was the best performer yoy among cargo airlines in 4Q23

	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
Atlas Air	2%	6%	6%	3%	2%	2%	-10%	1%	21%	15%	13%	1%	-6%	3%	15%	16%
Cargolux	-1%	22%	0%	11%	28%	0%	9%	-3%	-2%	-7%	-9%	-12%	-18%	-12%	-10%	2%
DHL	22%	3%	5%	25%	12%	28%	35%	-5%	-49%	-60%	-53%	-50%	13%	51%	31%	54%
FedEx	2%	7%	11%	11%	9%	6%	6%	3%	0%	0%	-2%	-9%	-12%	-16%	-13%	-9%
Lufthansa Cargo	13%	28%	25%	22%	4%	-11%	-22%	-12%	-10%	-6%	2%	-10%	-4%	-11%	-8%	-6%
UPS	11%	12%	10%	9%	6%	4%	2%	1%	1%	-1%	-6%	-4%	-7%	-16%	-13%	

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 182: Global airlines quarterly average flight cycles yoy growth

China airline cycles exhibited strong yoy growth in 4Q23

	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
EU Flag	-14%	-90%	-63%	-66%	-65%	267%	74%	111%	133%	138%	35%	21%	28%	7%	8%	9%
EU LCC	6%	-94%	-48%	-71%	-86%	344%	48%	165%	415%	241%	24%	15%	26%	-3%	-2%	0%
US Legacy	6%	-75%	-53%	-46%	-39%	206%	85%	66%	54%	31%	17%	13%	16%	13%	14%	9%
US Low Cost Carriers	-1%	-64%	-39%	-41%	-36%	127%	49%	56%	51%	19%	12%	11%	15%	11%	8%	13%
US Cargo	5%	9%	10%	9%	8%	5%	3%	2%	2%	1%	-1%	-7%	-9%	-11%	-11%	-8%
China Airlines	-46%	-55%	-5%	-3%	58%	141%	-11%	-28%	-31%	-67%	-29%	-46%	48%	166%	96%	180%
Middle East	-9%	-75%	-59%	-43%	-33%	161%	66%	32%	28%	30%	22%	12%	12%	14%	16%	16%
LATAM	0%	-90%	-77%	-46%	-35%	537%	246%	69%	43%	76%	36%	20%	24%	13%	10%	10%
Asia ex China	-1%	-80%	-61%	-48%	-39%	147%	27%	29%	21%	72%	66%	26%	32%	11%	12%	10%

Source: BofA Global Research, Flightradar24

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Exhibit 183: Europe airports quarterly average flight cycles yoy growth

London Southend cycles exhibited the strongest performance in 4Q23

	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
London Heathrow	-13%	-84%	-66%	-63%	-71%	77%	35%	68%	151%	190%	76%	41%	48%	13%	20%	14%
Paris Charles de Gaulle	-14%	-85%	-57%	-65%	-58%	143%	37%	97%	95%	124%	41%	25%	27%	9%	8%	9%
Amsterdam Schiphol	-13%	-86%	-54%	-58%	-60%	165%	50%	82%	117%	125%	23%	8%	14%	5%	11%	16%
Frankfurt	-20%	-82%	-65%	-64%	-60%	120%	70%	100%	95%	101%	25%	13%	21%	7%	16%	13%
Madrid-Barajas	-12%	-92%	-68%	-69%	-63%	375%	87%	122%	138%	110%	39%	29%	23%	9%	8%	8%
Barcelona	-17%	-94%	-65%	-74%	-76%	407%	84%	174%	255%	175%	35%	26%	31%	8%	8%	13%
Ibiza	-16%	-94%	-46%	-53%	-42%	797%	93%	149%	133%	120%	15%	7%	18%	4%	1%	2%
Mykonos	-41%	-93%	-50%	-57%	18%	774%	140%	158%	128%	103%	17%	22%	19%	-14%	-8%	5%
Istanbul - Istanbul Atatürk Airport	-18%	-91%	-64%	-57%	-45%	465%	113%	87%	75%	92%	35%	28%	39%	20%	15%	12%
Sheremetyevo Moscow	-5%	-83%	-61%	-60%	-53%	233%	75%	67%	24%	-28%	-18%	-26%	3%	41%	17%	17%
Munich	-19%	-93%	-71%	-77%	-83%	218%	56%	161%	298%	216%	59%	24%	25%	2%	5%	4%
London Gatwick	-17%	-98%	-74%	-84%	-94%	211%	-3%	146%	752%	1027%	234%	115%	79%	9%	9%	10%
Rome Fiumicino	-27%	-90%	-71%	-74%	-72%	149%	50%	102%	150%	170%	63%	44%	47%	18%	19%	26%
Paris Orly	-18%	-98%	-62%	-62%	-61%	2061%	88%	111%	134%	146%	32%	28%	15%	6%	4%	-2%
Milan Malpensa	-21%	-83%	-62%	-66%	-55%	132%	43%	102%	129%	122%	33%	17%	16%	4%	7%	8%
London Stansted	-15%	-89%	-54%	-68%	-77%	131%	32%	146%	261%	264%	53%	23%	31%	7%	8%	7%
London City	-21%	-99%	-89%	-91%	-96%	1161%	112%	326%	1012%	719%	184%	68%	73%	0%	-3%	4%
London Luton	-14%	-92%	-44%	-70%	-75%	240%	5%	160%	262%	267%	67%	22%	32%	4%	5%	7%
London Southend	30%	-80%	-50%	-49%	-75%	86%	-10%	-33%	36%	-33%	-39%	-60%	-52%	-19%	-22%	70%

Source: BofA Global Research, Flightradar24

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Exhibit 184: Asia airports quarterly average flight cycles yoy growth

Xianyang exhibited the strongest performance in 4Q23

	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
Beijing Capital	-52%	-77%	-50%	-35%	-3%	173%	0%	-32%	-27%	-73%	-29%	-58%	39%	263%	94%	281%
Dubai	-18%	-78%	-65%	-49%	-37%	184%	66%	57%	63%	49%	63%	25%	24%	40%	19%	14%
Tokyo Haneda	-6%	-69%	-46%	-35%	-50%	81%	14%	15%	61%	47%	43%	26%	30%	24%	19%	14%
Hong Kong	-41%	-71%	-72%	-64%	-49%	7%	31%	22%	-2%	-2%	-11%	-4%	75%	108%	115%	103%
Shanghai Hongqiao	-43%	-40%	-3%	-3%	51%	63%	-17%	-15%	-26%	-96%	-28%	-33%	48%	2426%	75%	81%
Shanghai Pudong	-45%	-57%	-26%	-28%	20%	101%	-18%	-11%	-11%	-84%	-27%	-31%	22%	465%	125%	124%
Shenzhen Airport	-35%	-20%	1%	2%	39%	12%	-18%	-12%	-36%	-25%	-9%	-31%	79%	73%	53%	94%
Indira Gandhi	1%	-84%	-61%	-43%	-20%	232%	64%	47%	2%	79%	41%	8%	26%	5%	7%	3%
Guangzhou Baiyun	-40%	-42%	-15%	-3%	36%	28%	-17%	-37%	-28%	-51%	-14%	-51%	30%	113%	60%	218%
Incheon	-27%	-75%	-73%	-67%	-53%	42%	30%	23%	9%	9%	35%	48%	90%	112%	92%	64%
Soekarno-Hatta	2%	-78%	-60%	-42%	-44%	163%	-18%	-3%	26%	54%	137%	41%	26%	13%	15%	12%
Singapore Changi	-21%	-86%	-83%	-78%	-68%	91%	69%	57%	52%	94%	115%	114%	104%	63%	44%	26%
Suvarnabhumi	-19%	-87%	-75%	-61%	-63%	118%	-20%	-6%	41%	92%	212%	95%	78%	47%	33%	21%
Kuala Lumpur	-17%	-92%	-82%	-86%	-83%	78%	-25%	118%	158%	206%	279%	109%	99%	87%	58%	30%
Chengdu Shuangliu	-35%	-39%	-3%	-5%	40%	78%	-22%	-32%	-35%	-62%	-48%	-40%	3%	47%	47%	42%
Taiwan	-61%	-57%	19%	29%	101%	179%	-5%	-20%	-19%	-69%	-16%	-54%	28%	245%	44%	178%
Xianyang	-36%	-38%	28%	-14%	62%	140%	-13%	-36%	-68%	-63%	-26%	-54%	231%	159%	86%	326%
Osaka Kansai	-22%	-78%	-71%	-69%	-66%	29%	14%	20%	36%	42%	40%	50%	79%	80%	74%	56%
Tokyo Haneda	-6%	-69%	-46%	-35%	-50%	81%	14%	15%	61%	47%	43%	26%	30%	24%	19%	14%
Tokyo Narita	-9%	-67%	-62%	-53%	-51%	41%	31%	24%	27%	27%	29%	23%	35%	29%	25%	23%
Chongqing Jianyebei	-36%	-22%	-1%	4%	43%	36%	-16%	-29%	-20%	-52%	-31%	-68%	1%	78%	74%	282%

Source: BofA Global Research, Flightradar24

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Exhibit 185: North America airports quarterly average flight cycles yoy growth

Orlando delivered the strongest performance in 4Q23

	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
Hartsfield-Jackson Atlanta	-5%	-73%	-45%	-33%	-23%	184%	44%	24%	10%	1%	0%	0%	8%	8%	8%	8%
Los Angeles (LAX)	-8%	-71%	-56%	-46%	-39%	140%	81%	55%	43%	18%	1%	-3%	1%	3%	7%	9%
Chicago O'Hare	-1%	-70%	-51%	-50%	-45%	129%	70%	61%	47%	13%	-9%	-8%	2%	-1%	3%	4%
Dallas/Fort Worth	-1%	-56%	-34%	-23%	-14%	107%	37%	20%	8%	1%	-1%	-4%	3%	2%	6%	10%
Denver	6%	-60%	-37%	-26%	-21%	127%	54%	27%	20%	4%	-5%	2%	11%	9%	11%	11%
John F. Kennedy (JFK)	-10%	-84%	-68%	-58%	-52%	268%	123%	103%	113%	57%	38%	21%	12%	9%	5%	6%
San Francisco	-4%	-76%	-62%	-57%	-54%	106%	58%	58%	70%	62%	29%	14%	12%	9%	10%	11%
McCarran	-2%	-67%	-42%	-39%	-35%	150%	58%	57%	62%	31%	21%	18%	20%	10%	4%	11%
Seattle-Tacoma	-1%	-63%	-41%	-31%	-24%	125%	45%	21%	17%	6%	4%	5%	6%	5%	7%	7%
Toronto Pearson	-10%	-85%	-77%	-74%	-77%	31%	80%	135%	180%	283%	92%	32%	42%	12%	6%	11%
Mexico City	11%	-82%	-60%	-44%	-36%	307%	96%	45%	37%	27%	15%	5%	4%	-8%	-8%	-7%
Orlando	0%	-69%	-48%	-39%	-32%	190%	85%	57%	42%	14%	8%	8%	17%	14%	16%	19%

Source: BofA Global Research, Flightradar24

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Exhibit 186: Oceania airports quarterly average flight cycles yoy growth

All Oceania airports reported strong performance in 4Q23

	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
Melbourne	-11%	-87%	-89%	-78%	-55%	335%	99%	53%	59%	51%	261%	152%	45%	12%	20%	15%
Auckland	-12%	-78%	-57%	-45%	-38%	199%	4%	-46%	4%	5%	71%	186%	49%	31%	23%	13%
Sydney	-10%	-84%	-80%	-69%	-54%	288%	-2%	23%	49%	31%	315%	129%	50%	12%	16%	9%
Brisbane	-7%	-75%	-63%	-52%	-36%	180%	18%	14%	11%	22%	82%	64%	45%	16%	22%	13%

Source: BofA Global Research, Flightradar24

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Exhibit 187: LATAM airports quarterly average flight cycles yoy growth

Santiago was the strongest Latam airport in 4Q23

	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
Mexico City	11%	-82%	-60%	-44%	-36%	307%	96%	45%	37%	27%	15%	5%	4%	-8%	-8%	-7%
Sao Paulo - Guarulhos International	2%	-80%	-58%	-34%	-35%	214%	84%	28%	29%	56%	27%	12%	18%	23%	15%	10%
Bogota	7%	-90%	-86%	-54%	-31%	636%	424%	83%	49%	53%	34%	20%	15%	3%	7%	7%
Cancun	-6%	-88%	-54%	-22%	-16%	724%	142%	55%	49%	29%	19%	11%	12%	12%	7%	8%
Santiago	-10%	-82%	-77%	-55%	-48%	131%	162%	52%	47%	91%	38%	24%	26%	21%	23%	17%

Source: BofA Global Research, Flightradar24

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Exhibit 188: Global airports quarterly average flight cycles yoy growth

Chinese airports reported strong yoy growth in 4Q23

	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
Chinese Airports	-40%	-46%	-16%	-12%	30%	72%	-11%	-24%	-26%	-62%	-27%	-42%	39%	157%	85%	150%
Top 10 European airports	-16%	-87%	-64%	-65%	-63%	196%	64%	98%	113%	111%	34%	20%	27%	12%	12%	13%
Top 10 NA airports	-3%	-70%	-50%	-42%	-36%	136%	59%	43%	36%	20%	7%	4%	9%	6%	7%	9%
Top 10 APAC airports	-27%	-71%	-54%	-45%	-34%	81%	7%	3%	9%	-6%	21%	7%	44%	72%	51%	55%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 189: EU short airport-pairs quarterly average flight cycles yoy growth

FRA-LTN route delivered the strongest performance through 4Q23

	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
AMS-LCY	-17%	-100%	-91%	-89%	-95%	n.m.	117%	228%	820%	771%	235%	88%	90%	14%	21%	22%
AMS-LGW	-19%	-100%	-75%	-94%	-99%	4900%	-58%	232%	2900%	2398%	660%	268%	191%	18%	7%	14%
AMS-LHR	-12%	-88%	-73%	-75%	-82%	62%	25%	117%	245%	307%	139%	57%	59%	1%	12%	2%
AMS-LTN	-16%	-99%	-71%	-89%	-97%	86%	1%	378%	1918%	3346%	200%	40%	42%	6%	10%	21%
AMS-SEN	-26%	-85%	-47%	-54%	-100%	-100%	-100%	-100%	n.m.	n.m.	n.m.	0%	1050%	n.m.	n.m.	
AMS-STN	-13%	-79%	-58%	-72%	-76%	-9%	17%	167%	205%	367%	57%	18%	31%	4%	12%	4%
CDG-FRA	-16%	-78%	-65%	-69%	-61%	58%	67%	149%	132%	123%	20%	7%	5%	10%	22%	10%
CIA-CDG	-16%	-78%	-65%	-71%	-64%	53%	65%	147%	148%	129%	24%	19%	4%	12%	15%	3%
CIA-FRA	-1%	n.m.	n.m.	-100%	102%	n.m.	0%	n.m.	-50%	150%	300%	75%	700%	60%	50%	0%
CIA-LHR	-26%	-69%	-46%	-63%	-81%	-15%	-28%	44%	281%	157%	93%	57%	39%	10%	11%	1%
CIA-LTN	-41%	-100%	-99%	-96%	-96%	n.m.	1600%	3033%	2750%	243%	41%	-82%	-74%	13%	8%	41%
CIA-SEN	n.m.	-100%	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	-100%	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	0%
CIA-STN	-18%	-98%	-67%	-89%	-95%	1171%	63%	436%	1394%	345%	62%	70%	78%	12%	13%	8%
DUB-LCY	-16%	-100%	-97%	-97%	-97%	n.m.	344%	1278%	1845%	2203%	437%	37%	54%	1%	6%	4%
DUB-LGW	-13%	-91%	-77%	-88%	-95%	-59%	54%	518%	1364%	2818%	183%	37%	42%	3%	13%	9%
DUB-LHR	-15%	-84%	-75%	-77%	-81%	38%	41%	128%	236%	282%	109%	60%	55%	3%	21%	11%
DUB-LTN	-22%	-97%	-60%	-80%	-86%	89%	3%	335%	636%	2235%	182%	30%	32%	5%	4%	2%
DUB-SEN	-52%	-98%	-98%	-98%	-100%	-67%	-75%	-67%	n.m.	200%	200%	100%	n.m.	0%	-100%	0%
DUB-STN	-7%	-74%	-50%	-67%	-71%	14%	23%	165%	187%	196%	30%	-3%	12%	-2%	10%	0%
FCO-CDG	-23%	-82%	-50%	-64%	-47%	176%	17%	87%	71%	73%	24%	25%	23%	1%	7%	-2%
FCO-FRA	-17%	-89%	-79%	-81%	-85%	72%	70%	160%	249%	323%	90%	33%	55%	8%	22%	25%
FCO-LCY	-16%	-100%	-78%	-94%	-99%	1100%	-78%	309%	3067%	5633%	1213%	203%	141%	19%	9%	12%
FCO-LGW	-16%	-91%	-67%	-77%	-87%	87%	-9%	105%	293%	389%	193%	91%	110%	3%	5%	2%
FCO-LHR	-20%	-81%	-60%	-76%	-89%	-17%	-24%	91%	480%	353%	140%	52%	42%	10%	13%	14%
FCO-LTN	-32%	-100%	-69%	-87%	-93%	n.m.	98%	496%	1170%	459%	66%	49%	65%	36%	39%	32%
FCO-ORY	-37%	-100%	-73%	-88%	-93%	3700%	88%	401%	977%	448%	73%	76%	89%	36%	36%	32%
FCO-SEN	-3%	-76%	-34%	-54%	-81%	-91%	-58%	2%	142%	3100%	71%	24%	37%	-2%	0%	-7%
FCO-STN	-90%	-50%	-50%	n.m.	102%	0%	100%	33%	350%	700%	0%	-75%	-44%	613%	n.m.	n.m.
FRA-LCY	-16%	-94%	-82%	-90%	-94%	-18%	70%	556%	1151%	1949%	227%	48%	51%	-5%	0%	-4%
FRA-LGW	-51%	-100%	n.m.	300%	-100%	n.m.	300%	-75%	n.m.	n.m.	-50%	100%	n.m.	3225%	n.m.	n.m.
FRA-LHR	-19%	-81%	-71%	-75%	-79%	47%	29%	117%	182%	209%	84%	59%	76%	0%	22%	12%
FRA-LTN	-27%	-98%	-99%	-91%	-85%	-25%	400%	48%	46%	1600%	450%	84%	26%	39%	36%	77%
FRA-SEN	-16%	-99%	-66%	-89%	-96%	1383%	61%	432%	1540%	347%	63%	74%	82%	-1%	0%	-2%
FRA-STN	20%	-96%	-55%	-85%	-95%	186%	-5%	397%	1367%	80%	-88%	-95%	-88%	-97%	0%	-88%
ORY-FRA	-13%	-100%	-99%	-99%	-100%	n.m.	408%	5714%	32300%	n.m.	469%	11%	37%	-2%	-2%	3%
CIA-ORY	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	0%	n.m.	n.m.	-100%	-100%	100%	n.m.	n.m.	n.m.	-50%
LGW-CIA	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.

Source: BofA Global Research, Flightradar24

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Exhibit 190: EU International airport-pairs quarterly average flight cycles yoy growth

JFK-LHR exhibited the strongest performance through 4Q23

	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
JFK-CDG	-12%	-85%	-63%	-54%	-51%	225%	79%	91%	133%	138%	78%	37%	17%	15%	32%	16%
JFK-FRA	-14%	-87%	-71%	-61%	-59%	225%	54%	76%	111%	165%	154%	53%	27%	6%	8%	11%
JFK-LHR	-16%	-73%	-63%	-53%	-51%	52%	33%	45%	67%	124%	75%	35%	31%	17%	30%	27%

Source: BofA Global Research, Flightradar24

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Exhibit 191: APAC airport-pairs quarterly average flight cycles yoy growth

PKX-CAN was the most resilient route in APAC in 4Q23

	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23
DEL-BOM	-4%	-92%	-76%	-57%	-36%	342%	118%	86%	18%	148%	49%	2%	31%	-2%	9%	5%
GMP-CJU	-17%	-22%	-9%	-9%	1%	36%	12%	19%	33%	6%	9%	-4%	-5%	-11%	-10%	-5%
HND-CTS	-2%	-55%	-23%	-15%	-33%	72%	17%	24%	57%	47%	31%	11%	15%	5%	-1%	1%
HND-FUK	5%	-52%	-19%	-11%	-33%	72%	15%	16%	56%	42%	28%	9%	13%	3%	3%	1%
NRT-CTS	-7%	-82%	-54%	-50%	-74%	126%	25%	42%	175%	123%	83%	85%	60%	13%	2%	-8%
NRT-FUK	20%	-73%	-39%	-40%	-61%	135%	23%	43%	145%	88%	48%	33%	24%	-3%	7%	12%
PEK-CAN	-58%	-94%	-30%	-30%	11%	761%	-34%	-45%	-32%	-82%	-58%	-73%	26%	273%	215%	500%
PEK-PVG	-58%	-85%	-57%	-39%	1%	247%	-23%	-26%	-10%	-76%	-30%	-30%	-4%	218%	186%	177%
PEK-SHA	-62%	-90%	-22%	-1%	93%	874%	-7%	-21%	-26%	-97%	-25%	-48%	68%	3335%	80%	126%
PKX-CAN	n.m.	n.m.	42233%	492%	661%	976%	108%	-39%	-4%	-89%	-54%	-80%	31%	389%	229%	742%
PKX-PVG	n.m.	n.m.	70200%	163%	294%	917%	0%	-25%	-40%	-100%	-22%	-68%	156%	n.m.	199%	481%
PKX-SHA	n.m.	n.m.	45500%	60%	135%	162%	-3%	-5%	-7%	-100%	-25%	-29%	63%	93600%	138%	128%
PVG-CAN	-61%	-94%	-39%	-3%	105%	1308%	17%	-1%	-22%	-94%	-14%	-46%	57%	1381%	139%	240%
SHA-CAN	-54%	-76%	8%	0%	84%	266%	-20%	-17%	-26%	-99%	-41%	-55%	42%	6425%	110%	165%
SIN-CGK	-21%	-86%	-86%	-83%	-72%	74%	68%	56%	37%	87%	98%	133%	148%	95%	74%	27%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH



Exhibit 192: North America airport-pairs quarterly average flight cycles yoy growth

LGA-LAX exhibited the strongest growth in North America in 4Q23

	1Q20	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23		
ATL-MCO	-4%	-72%	-45%	-33%	-25%	188%	48%	20%	7%	4%	8%	3%	20%	14%	18%	23%		
EWR-ATL	-2%	-83%	-40%	-37%	-31%	305%	34%	63%	42%	24%	5%	-11%	1%	-1%	-2%	-4%		
EWR-BOS	30%	-88%	-75%	-77%	-77%	218%	132%	129%	189%	159%	49%	31%	32%	-2%	-18%	-19%		
EWR-LAX	-7%	-72%	-49%	-44%	-40%	83%	42%	58%	94%	103%	40%	16%	14%	12%	15%	13%		
EWR-SFO	-6%	-78%	-66%	-67%	-66%	53%	37%	113%	168%	124%	37%	-11%	-1%	-4%	11%	17%		
JFK-LHR	-16%	-73%	-63%	-53%	-51%	52%	33%	45%	67%	125%	75%	35%	31%	17%	37%	29%		
LAX-LAS	-8%	-77%	-55%	-47%	-40%	223%	73%	54%	39%	23%	22%	12%	20%	3%	-8%	2%		
LAX-SFO	-12%	-70%	-52%	-48%	-47%	94%	47%	45%	37%	32%	10%	3%	7%	4%	-2%	2%		
LGA-ATL	-9%	-80%	-59%	-59%	-57%	124%	48%	105%	125%	86%	39%	-2%	-6%	-2%	-3%	8%		
LGA-BOS	-6%	-89%	-78%	-85%	-86%	116%	62%	364%	548%	237%	164%	37%	16%	3%	-23%	-10%		
LGA-LAX	-1%	n.m.	43%	-79%	-92%	-92%	-40%	100%	1200%									
ORD-LAX	-11%	-67%	-52%	-49%	-53%	87%	63%	56%	83%	32%	9%	12%	7%	4%	1%	-6%		
SEA-LAX	-12%	-68%	-44%	-38%	-30%	114%	40%	17%	10%	-6%	-17%	-6%	4%	16%	29%	12%		

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 193: CFM quarterly engine hours growth vs 2019

CFM LEAP 1-B outperformed the rest of CFM family in 4Q23

	BR700	CF6	CFM LEAP 1-B	CFM/V2500	CFM56-3	CFM56-5B	CFM56-5C	CFM56-7B	CFMLEAP 1-A
1Q20	-9%	-2%	-100%	276%	2%	-12%	-35%	-8%	57%
2Q20	-81%	-48%	-80%	-99%	-57%	-88%	-88%	-83%	-77%
3Q20	-61%	-45%	-50%	-38%	-50%	-52%	-85%	-49%	-23%
4Q20	-61%	-35%	87%	-93%	-25%	-53%	-75%	-48%	-26%
1Q21	-54%	-32%	-82%	-100%	-8%	-46%	-77%	-43%	19%
2Q21	-53%	-31%	14762%	-100%	-26%	-40%	-72%	-34%	17%
3Q21	-56%	-26%	39908%	-100%	-30%	-31%	-63%	-25%	34%
4Q21	-50%	-18%	39609%	-100%	-2%	-36%	-45%	-26%	25%
1Q22	-44%	-16%	87%	-100%	9%	-41%	-52%	-29%	89%
2Q22	-40%	-16%	67727%	-100%	-9%	-34%	-50%	-26%	84%
3Q22	-39%	-18%	99097%	-100%	-20%	-27%	-50%	-22%	76%
4Q22	-34%	-15%	80590%	-100%	-7%	-32%	-49%	-26%	60%
1Q23	-33%	-14%	274%	-100%	3%	-25%	-55%	-17%	169%
2Q23	-37%	-16%	118283%	-100%	-22%	-24%	-55%	-19%	135%
3Q23	-37%	-16%	168585%	-100%	-29%	-13%	-46%	-11%	137%
4Q23	-28%	-14%	131267%	-100%	-28%	-18%	-36%	-14%	110%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 194: GE, P&W quarterly engine hours growth vs 2019

PW1900G outperformed the rest of PW family in 4Q23

	GE CF34	GE90	GENX	GENX-2B	GP7200	PW100	PW1100G	PW1500G	PW1900G	PW2000	PW4000
1Q20	5%	-11%	0%	-4%	-8%	12%	67%	65%	312%	0%	-17%
2Q20	-76%	-59%	-68%	-21%	-100%	-76%	-66%	-59%	-3%	-69%	-69%
3Q20	-49%	-50%	-48%	-17%	-98%	-48%	-11%	-16%	47%	-53%	-65%
4Q20	-41%	-40%	-36%	-18%	-96%	-43%	1%	-40%	30%	-31%	-54%
1Q21	-28%	-41%	-25%	-9%	-96%	-28%	92%	5%	311%	-28%	-59%
2Q21	-20%	-35%	-19%	-12%	-94%	-32%	62%	20%	286%	-30%	-48%
3Q21	-9%	-32%	-19%	-5%	-87%	-28%	60%	60%	330%	-30%	-42%
4Q21	-11%	-25%	-14%	-2%	-74%	-17%	68%	70%	208%	-22%	-36%
1Q22	-11%	-26%	-1%	-4%	-64%	-4%	180%	204%	745%	-23%	-43%
2Q22	-11%	-21%	3%	-10%	-54%	7%	160%	183%	737%	-34%	-40%
3Q22	-14%	-17%	1%	-6%	-51%	7%	133%	140%	514%	-35%	-38%
4Q22	-19%	-15%	-1%	-5%	-42%	2%	107%	131%	319%	-30%	-36%
1Q23	-7%	-14%	22%	3%	-33%	20%	274%	336%	1320%	-27%	-35%
2Q23	-9%	-10%	20%	-4%	-26%	22%	197%	264%	1169%	-33%	-30%
3Q23	-9%	-4%	24%	2%	-27%	20%	179%	200%	966%	-33%	-26%
4Q23	-10%	-1%	21%	5%	-24%	11%	130%	190%	683%	-29%	-26%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH



Exhibit 195: Trent quarterly engine hours growth vs 2019

Trent 7000 delivered the best performance in 4Q23

	RB211	TRENT 1000	TRENT 700	TRENT 7000	TRENT 800	TRENT 900	TRENT XWB	V2500
1Q20	22%	-2%	-25%	978%	-8%	-16%	20%	-8%
2Q20	-72%	-71%	-81%	-23%	-88%	-98%	-63%	-89%
3Q20	-67%	-66%	-71%	-48%	-87%	-97%	-46%	-66%
4Q20	-59%	-52%	-63%	-44%	-81%	-97%	-36%	-65%
1Q21	-51%	-46%	-62%	494%	-70%	-98%	-13%	-63%
2Q21	-56%	-43%	-55%	206%	-65%	-98%	-12%	-55%
3Q21	-47%	-36%	-59%	73%	-60%	-98%	-9%	-45%
4Q21	-38%	-26%	-54%	24%	-56%	-95%	-4%	-42%
1Q22	-36%	-17%	-56%	1362%	-56%	-88%	16%	-41%
2Q22	-44%	-13%	-57%	626%	-58%	-78%	12%	-30%
3Q22	-41%	-7%	-53%	216%	-54%	-69%	14%	-30%
4Q22	-43%	-5%	-53%	105%	-52%	-63%	15%	-28%
1Q23	-41%	10%	-44%	2478%	-48%	-59%	58%	-25%
1Q23	-41%	10%	-44%	2478%	-48%	-59%	58%	-25%
2Q23	-49%	7%	-43%	949%	-50%	-56%	53%	-26%
3Q23	-45%	9%	-33%	376%	-45%	-55%	61%	-26%
4Q23	-42%	10%	-33%	197%	-47%	-49%	60%	-25%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 196: CFM56-5B quarterly engine hours growth vs 2019

Latam remained the best-performing region among all in 4Q23

	Africa	Europe	North America	Latin America	Middle East	APAC
1Q20	9%	-12%	10%	-4%	-9%	-28%
2Q20	-90%	-95%	-75%	-96%	-95%	-88%
3Q20	-53%	-65%	-53%	-85%	-83%	-41%
4Q20	-64%	-76%	-47%	-57%	-73%	-43%
1Q21	-56%	-80%	-35%	-48%	-67%	-36%
2Q21	-45%	-73%	-25%	-53%	-63%	-30%
3Q21	-17%	-42%	-22%	-31%	-53%	-42%
4Q21	-45%	-40%	-19%	-16%	-45%	-53%
1Q22	-47%	-46%	-8%	-16%	-39%	-65%
2Q22	-37%	-30%	-7%	-3%	-31%	-66%
3Q22	-40%	-23%	-9%	2%	-27%	-55%
4Q22	-35%	-30%	-13%	-4%	-33%	-56%
1Q23	-25%	-34%	-3%	-3%	-25%	-40%
2Q23	-31%	-27%	-6%	5%	-24%	-41%
3Q23	-43%	-23%	-8%	3%	-24%	-15%
4Q23	-38%	-27%	-13%	0%	-30%	-23%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 197: CFM56-7B quarterly engine hours growth vs 2019

Europe was the best-performing region among all in 4Q23

	Africa	Europe	North America	Latin America	Middle East	APAC
1Q20	31%	-9%	3%	7%	-17%	-25%
2Q20	-94%	-95%	-72%	-94%	-95%	-84%
3Q20	-73%	-56%	-50%	-79%	-82%	-42%
4Q20	-62%	-64%	-46%	-55%	-68%	-41%
1Q21	-39%	-75%	-39%	-46%	-59%	-38%
2Q21	-37%	-67%	-28%	-65%	-57%	-23%
3Q21	-32%	-28%	-19%	-52%	-51%	-41%
4Q21	-38%	-20%	-18%	-44%	-29%	-49%
1Q22	-21%	-25%	-13%	-26%	-35%	-58%
2Q22	-22%	-16%	-14%	-29%	-32%	-56%
3Q22	-34%	-13%	-14%	-31%	-22%	-47%
4Q22	-33%	-16%	-18%	-29%	-20%	-47%
1Q23	-4%	-17%	-10%	-17%	-18%	-32%
2Q23	-11%	-13%	-15%	-17%	-16%	-37%
3Q23	-22%	-12%	-15%	-26%	-17%	-14%
4Q23	-25%	-14%	-17%	-32%	-24%	-16%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH



Exhibit 198: CF6 quarterly engine hours growth vs 2019

North America remained the best-performing region as of 4Q23

	Africa	Europe	North America	Latin America	Middle East	APAC
1Q20	-3%	-10%	13%	13%	-11%	-17%
2Q20	-67%	-74%	-26%	-60%	-63%	-51%
3Q20	-53%	-71%	-24%	-55%	-59%	-45%
4Q20	-41%	-59%	-14%	-50%	-55%	-38%
1Q21	-24%	-57%	-3%	-40%	-67%	-45%
2Q21	-18%	-59%	-3%	-38%	-63%	-40%
3Q21	-26%	-50%	2%	-38%	-55%	-36%
4Q21	-23%	-39%	3%	-34%	-43%	-27%
1Q22	-11%	-37%	12%	-23%	-48%	-33%
2Q22	8%	-33%	4%	-21%	-40%	-28%
3Q22	7%	-31%	1%	-25%	-38%	-28%
4Q22	0%	-25%	-1%	-29%	-41%	-23%
1Q23	7%	-24%	6%	-20%	-36%	-30%
2Q23	9%	-25%	0%	-18%	-29%	-31%
3Q23	-5%	-27%	0%	-16%	-42%	-24%
4Q23	-4%	-23%	-2%	-21%	-46%	-17%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 199: GE90 quarterly engine hours growth vs 2019

Europe remained the best-performing region as of 4Q23

	Africa	Europe	North America	Latin America	Middle East	APAC
1Q20	-1%	-7%	-7%	-8%	-10%	-16%
2Q20	-57%	-61%	-59%	-80%	-57%	-57%
3Q20	-41%	-54%	-53%	-68%	-45%	-46%
4Q20	-28%	-43%	-42%	-54%	-36%	-38%
1Q21	-29%	-42%	-42%	-47%	-35%	-41%
2Q21	-23%	-39%	-39%	-43%	-25%	-33%
3Q21	-16%	-34%	-29%	-40%	-26%	-35%
4Q21	-18%	-25%	-17%	-39%	-19%	-32%
1Q22	-15%	-23%	-15%	-32%	-20%	-35%
2Q22	-3%	-17%	-13%	-33%	-10%	-34%
3Q22	-2%	-10%	-8%	-25%	-10%	-30%
4Q22	-9%	-10%	-7%	-18%	-7%	-27%
1Q23	0%	-10%	-4%	-19%	-8%	-24%
2Q23	-8%	-1%	-3%	-25%	3%	-23%
3Q23	-2%	4%	2%	-23%	0%	-10%
4Q23	-3%	5%	4%	-22%	-1%	-6%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 200: GENX quarterly engine hours growth vs 2019

Africa remained the best-performing region as of 4Q23

	Africa	Europe	North America	Latin America	Middle East	APAC
1Q20	31%	14%	8%	27%	1%	-15%
2Q20	-69%	-70%	-62%	-75%	-83%	-66%
3Q20	-47%	-49%	-41%	-50%	-57%	-49%
4Q20	-33%	-31%	-29%	-21%	-45%	-43%
1Q21	-8%	-9%	-12%	33%	-25%	-41%
2Q21	-6%	-17%	-11%	14%	-18%	-28%
3Q21	3%	-19%	-2%	4%	-8%	-38%
4Q21	0%	-3%	3%	27%	-5%	-36%
1Q22	33%	21%	27%	68%	2%	-31%
2Q22	33%	30%	20%	49%	14%	-28%
3Q22	28%	21%	14%	30%	15%	-26%
4Q22	20%	18%	13%	17%	10%	-24%
1Q23	63%	50%	43%	52%	30%	-8%
2Q23	54%	48%	27%	46%	30%	-4%
3Q23	54%	41%	28%	32%	25%	8%
4Q23	47%	40%	30%	26%	22%	5%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH



Exhibit 201: PW100 quarterly engine hours growth vs 2019

Africa remained the best-performing region as of 4Q23

	Africa	Europe	North America	Latin America	Middle East	APAC
1Q20	9%	-5%	21%	21%	6%	21%
2Q20	-89%	-80%	-71%	-87%	41%	-74%
3Q20	-36%	-46%	-51%	-63%	15%	-45%
4Q20	-8%	-43%	-50%	-38%	-19%	-41%
1Q21	28%	-47%	-32%	-12%	-11%	-19%
2Q21	28%	-40%	-30%	-27%	11%	-28%
3Q21	45%	-22%	-23%	-12%	-13%	-38%
4Q21	50%	-12%	-21%	-14%	-33%	-23%
1Q22	85%	-16%	-10%	3%	-42%	0%
2Q22	56%	2%	-10%	12%	-26%	16%
3Q22	73%	13%	-9%	4%	-57%	4%
4Q22	68%	12%	-9%	-8%	-44%	-1%
1Q23	109%	12%	8%	16%	-25%	30%
2Q23	98%	19%	-3%	11%	38%	33%
3Q23	99%	25%	1%	17%	58%	17%
4Q23	105%	22%	-8%	-1%	37%	8%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 202: PW2000 quarterly engine hours growth vs 2019

Latam remained the best-performing region among all as of 4Q23

	Africa	Europe	North America	Latin America	Middle East	APAC
1Q20	19%	-11%	2%	8%	-14%	-5%
2Q20	-18%	-60%	-71%	-88%	-13%	-64%
3Q20	-17%	-59%	-52%	-71%	25%	-33%
4Q20	-14%	-23%	-31%	-41%	40%	-53%
1Q21	15%	-24%	-27%	-31%	30%	-61%
2Q21	-23%	-42%	-27%	-68%	65%	-39%
3Q21	3%	-39%	-27%	-54%	88%	-19%
4Q21	20%	-17%	-22%	-42%	194%	-45%
1Q22	19%	-37%	-19%	-35%	87%	-60%
2Q22	-24%	-47%	-31%	-46%	-3%	-50%
3Q22	-16%	-50%	-31%	-37%	5%	-39%
4Q22	33%	-43%	-27%	-44%	5%	-63%
1Q23	16%	-47%	-21%	-60%	-9%	-85%
2Q23	-27%	-52%	-28%	-28%	-5%	-91%
3Q23	-71%	-53%	-28%	-13%	-4%	-74%
4Q23	-100%	-55%	-24%	-8%	-85%	-74%

Source: BofA Global Research, Flightradar24

BofA GLOBAL RESEARCH

Exhibit 203: PW4000 quarterly engine hours growth vs 2019

Middle East reported the best performance in 4Q23

	Africa	Europe	North America	Latin America	Middle East	APAC
1Q20	6%	3%	9%	-43%	-5%	-33%
2Q20	-83%	-76%	-57%	-75%	-69%	-72%
3Q20	-75%	-80%	-59%	-73%	-81%	-62%
4Q20	-70%	-69%	-46%	-38%	-67%	-53%
1Q21	-56%	-70%	-41%	-49%	-64%	-64%
2Q21	-57%	-63%	-21%	-62%	-62%	-54%
3Q21	-50%	-45%	-6%	-53%	-68%	-58%
4Q21	-52%	-34%	1%	-48%	-52%	-52%
1Q22	-56%	-39%	-2%	-21%	-55%	-59%
2Q22	-68%	-25%	-1%	-43%	-51%	-59%
3Q22	-74%	-18%	-13%	-50%	-48%	-53%
4Q22	-64%	-32%	-18%	-40%	0%	-44%
1Q23	-60%	-35%	-21%	-37%	4%	-41%
2Q23	-59%	-31%	-18%	-42%	38%	-36%
3Q23	-60%	-28%	-20%	-31%	0%	-29%
4Q23	-55%	-36%	-21%	-31%	38%	-26%

Source: BofA Global Research, Flightradar24

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Exhibit 204: TRENT quarterly engine hours growth vs 2019

Africa reported the strongest growth among all regions in 4Q23

	Africa	Europe	North America	Latin America	Middle East	APAC
1Q20	24%	1%	2%	14%	-1%	-16%
2Q20	-75%	-76%	-80%	-75%	-68%	-78%
3Q20	-60%	-71%	-70%	-67%	-61%	-66%
4Q20	-53%	-60%	-56%	-55%	-50%	-59%
1Q21	-35%	-52%	-44%	-48%	-36%	-57%
2Q21	-27%	-53%	-40%	-48%	-32%	-49%
3Q21	-27%	-47%	-32%	-40%	-32%	-52%
4Q21	-34%	-32%	-17%	-30%	-33%	-49%
1Q22	-17%	-21%	-4%	-15%	-27%	-49%
2Q22	-7%	-19%	-7%	2%	-22%	-50%
3Q22	0%	-16%	-4%	-2%	-17%	-45%
4Q22	2%	-14%	2%	4%	-15%	-42%
1Q23	34%	1%	17%	22%	3%	-26%
2Q23	37%	1%	6%	23%	4%	-24%
3Q23	21%	7%	10%	15%	9%	-12%
4Q23	24%	11%	13%	24%	2%	-11%

Source: BofA Global Research, Flightradar24

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What is the BofA Commercial Aerospace Tracker?

In partnership with **BofA's Predictive Data Analytics** team, the BofA Commercial Aerospace Tracker analyses Flightradar24 data, which tracks ADS-B positions from global commercial, freight, regional, and business aircraft allowing daily tracking and analysis of flight activity. The dataset provides real-time insight into daily activity by **engine type, airframe, narrowbody vs widebody, commercial vs freight, region, airline, and airport**.

Below we highlight the data we intend to regularly highlight, which can help to provide a frame of reference for the COVID-19 recovery.

Exhibit 205: Available data matrix – Flight Radar daily aircraft cycles data

Available data matrix

Usage	Equipment	Engine type	Region	Aircraft type
Bizjet	A220	CF6	Africa	Bizjet
Commercial	A320neo	CFM LEAP	Asia-Pacific	Narrowbody
Freight	A320ceo	CFM56	Europe	Regional
Light	A330	GE CF34	Latin America	Widebody
Regional	A340	GE90	Middle East	
	A350	GE9X	North America	
	A380	GENX		
	A300	GENX-2B		
737 Original/Classic	GP7200			
737NG	JT3D			
737MAX	JT8D			
747	JT9D			
757	PW100			
767	PW1100G 'GTF'			
777	PW1500G			
787	PW1900G			
717	PW2000			
ATR family	PW4000			
Embraer 135/145	RB211			
Embraer E-Jet Family	TRENT			
	TRENT 1000			
	TRENT 500			
	TRENT 700			
	TRENT 7000			
	TRENT 800			
	TRENT 900			
	TRENT XWB			
	V2500			

Source: BofA Global Research, Flightradar24

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What is Flightradar24?

Flightradar24 is a global flight tracking service that provides real-time information about thousands of aircraft around the world. Flightradar24 has access to the largest ADS-B network in the world with over 20,000 connected receivers in the commercial fleet, tracking over 180,000 flights per day across commercial, freight, regional, light, military and more. Flightradar24 combines data from several data sources including ADS-B, MLAT and radar data. The ADS-B, MLAT and radar data is aggregated together with schedule and flight status data from airlines and airports. ([Source](#): Flightradar24.com)

How does BofA Research process Flightradar24's data?

In partnership with **BofA's Predictive Data Analytics** team, we apply an overlay to Flightradar24's daily flight data, stripping out takeoffs and landings by aircraft engine type, airframe, narrowbody vs widebody, commercial vs freight, region, airports, and more. This allows us to track the daily evolution of cycles for different aircraft and group in different datasets and display timeseries trends.

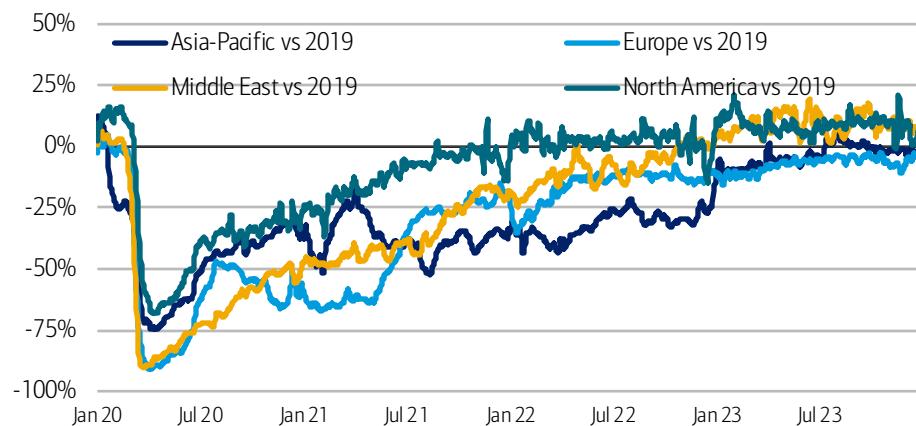
Data exceptions

Flightradar24 has an extensive database detailing aircraft registration, Mode S address, age, aircraft type, and more. Due to the large volume of data and continual updates there are occasionally minor inaccuracies. ([Source](#): Flightradar24).

The Flightradar24 data analysed and presented by **BofA Research** in the charts may also have some minor inaccuracies. This reflects in some cases inability to determine engine type for wetleased aircraft flying under different airline ICAO tags. In some cases, older commercial aircraft do not have ADS-B transponders fitted and do not appear in the daily data. For security and privacy reasons, information about some aircraft is limited or blocked. This includes most military aircraft and certain high-profile aircraft, such as Air Force One. We therefore cannot guarantee that the data we have analysed and displayed in the report is 100% representative of the number of flight movements for each platform/engine/region/use type, although we think that it is a good indicator.

Exhibit 206: Global commercial flights daily tracked 7-day avg. vs 2019

North America was the most resilient region throughout 2022-23, but all regions continue to recover



Source: BofA Global Research, Flightradar24

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