Welcome to
The Great Aero Recovery
featuring
Richard Aboulafia

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Aero Markets: Climbing Out of a Pit Beats Falling Into One

Richard Aboulafia

February 28, 2022

National Aeronautic Association

We’re 23 Months In. It’s Been Bad, But Initial Expectations Were Generally Worse Than We’ve Seen.

Aviation Segments by Damage (most to least)	Trends
Twin aisle jetliners	› International traffic hit hardest and longest › Already an overcapacity situation › Secular shift towards single aisles already underway › Today: Yeah, just that bad.
Single aisle jetliners	› Fuel prices a big problem › China comeback uncertain › Some relief due to deferred Airbus ramp, and MAX stop › Today: Much better, except for China
Business Jets	› Large cabin strongly correlated with oil prices › Small/medium strongly correlated with corporate profits, equities indices › Recovering quickly; just a 2020/21 downturn › Today: Much more upside than downside
Civil Rotary	› Oil and gas segment (large) hit again, before recovery even began › Today: No real change, but not better, either
Military Programs	› Emphasis on “shovel-ready.” › Advance development programs at greater risk › Pure-play contractors in best shape; suppliers with most defense in good shape too › Today: All good, as expected. In fact, better

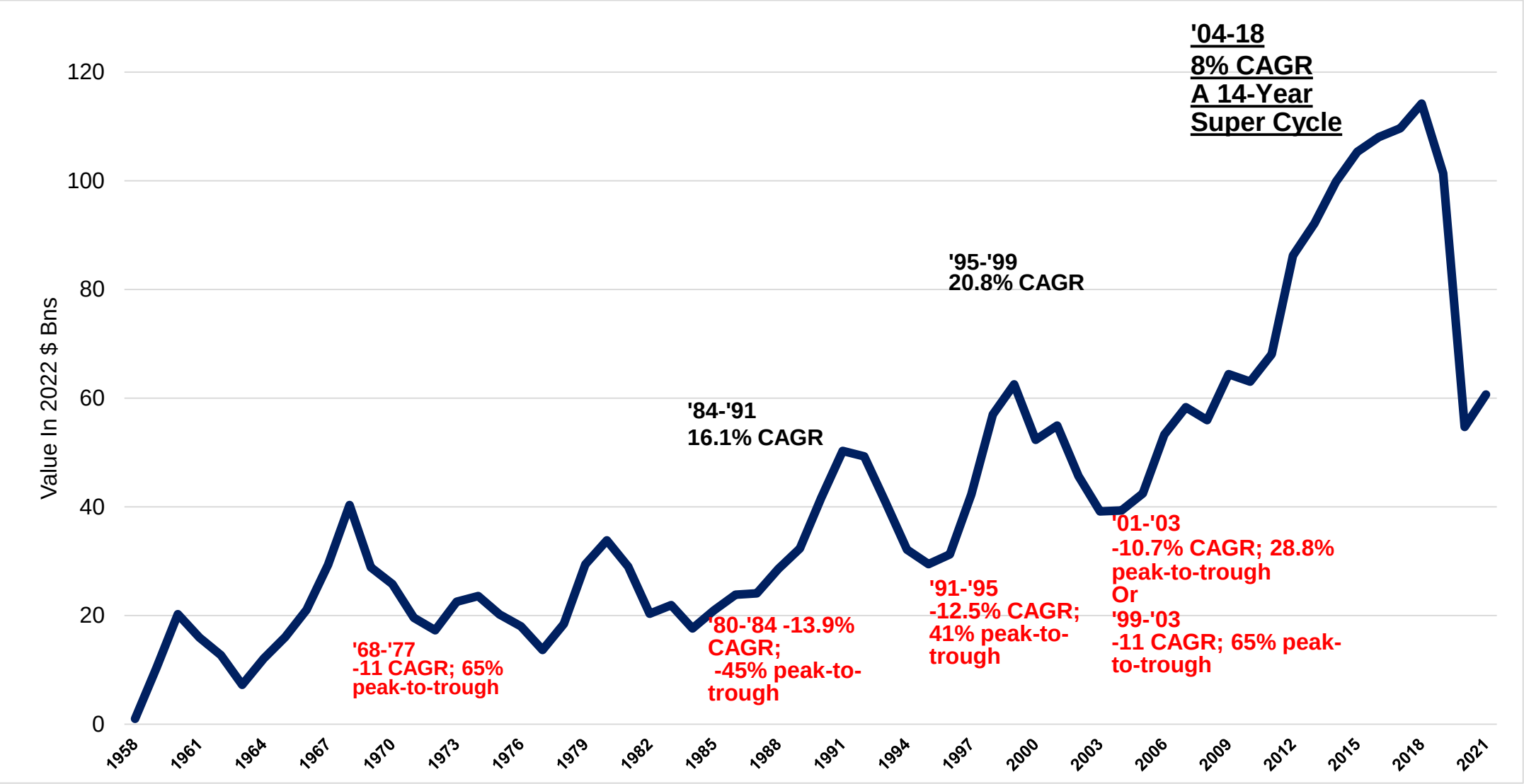
Aircraft Markets Have Had A Predictably Horrible Two Years

World Deliveries and CAGR for Aviation Segments, 2003 – 2021

World New Deliveries In 2021 (2022 $)	CAGR ’03-‘08	CAGR ’08-‘14	CAGR ’14-'19	Change ’19-‘21
Jetliners-SA ($39.2 b)	9.7%	6.9%	-2.0%	-33.4%
Jetliners-TA ($21.4 b)	5.0%	13.5%	2.1%	-59.9%
Regionals ($3.1 b)	3.9%	-3.1%	-6.3%	-43.7%
Business Aircraft ($19.4 b)	16.7%	-2.2%	-1.2%	-12.0%
Civil Rotorcraft ($3.1 b)	18.5%	-2.5%	-7.2%	-6.5%
Military Rotorcraft ($10.4 b)	10.6%	9.7%	-6.9%	-13.4%
Military Transports ($4.2 b)	3.2%	-0.7%	-0.3%	-27.8%
Fighters ($23.6 b)	1.6%	0.8%	6.1%	-7.3%
All Civil ($86.5 b)	9.7%	5.6%	-0.5%	-33.9%
All Military ($41.9 b)	3.9%	4.1%	0.0%	-10.1%
Total ($128.3 b)	8.0%	5.2%	-0.4%	-27.8%

The Ultimate Cycle…Or, Welcome Back to 2006

World Civil Transport Deliveries, 1958 – 2021



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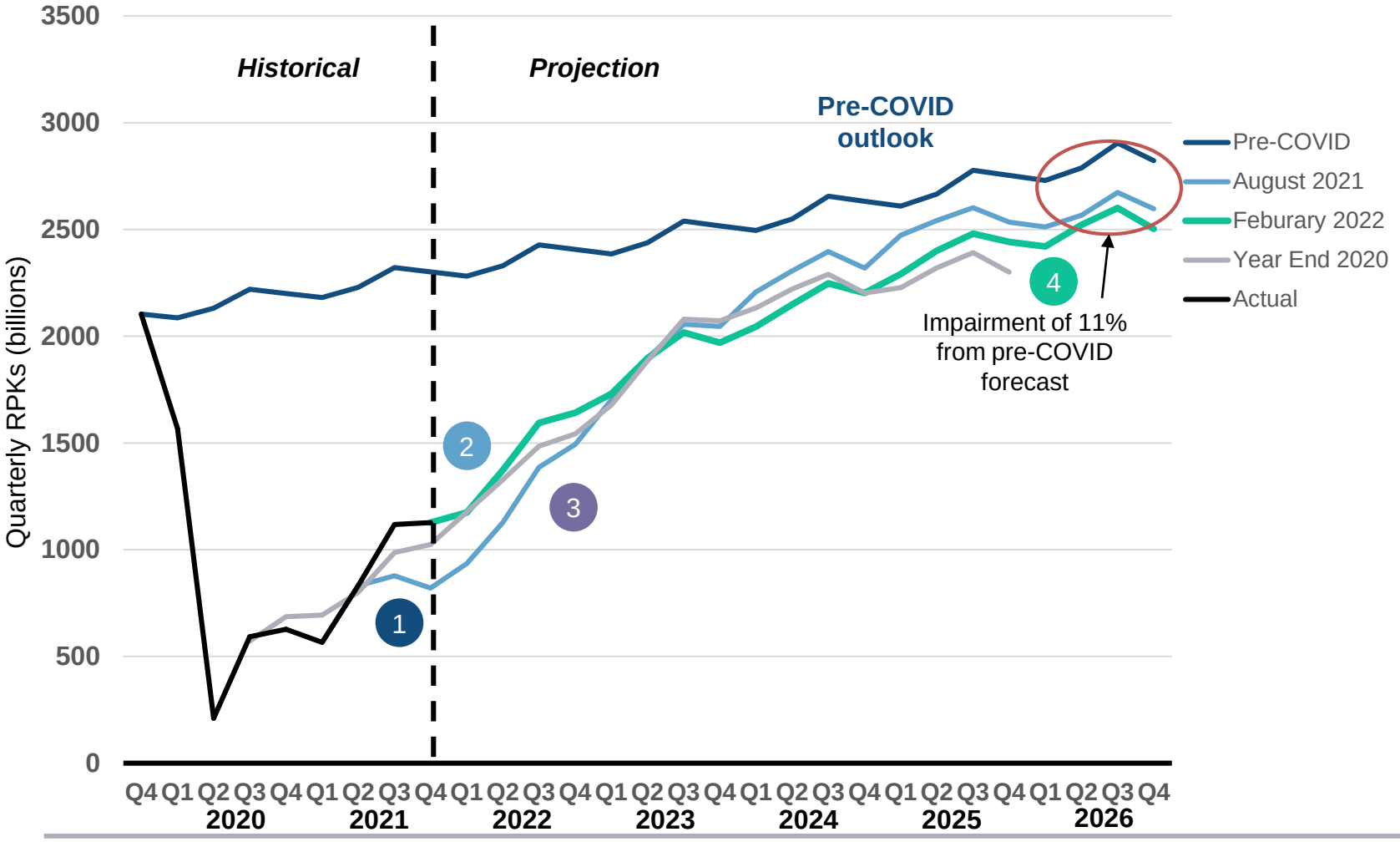
AeroDynamic RPK outlook: Revised with impacts from Omicron, China's COVID-zero policy, weakened GDP outlook, and regional demand substitution

AeroDynamic Advisory Revised Nominal Scenario for Air Travel

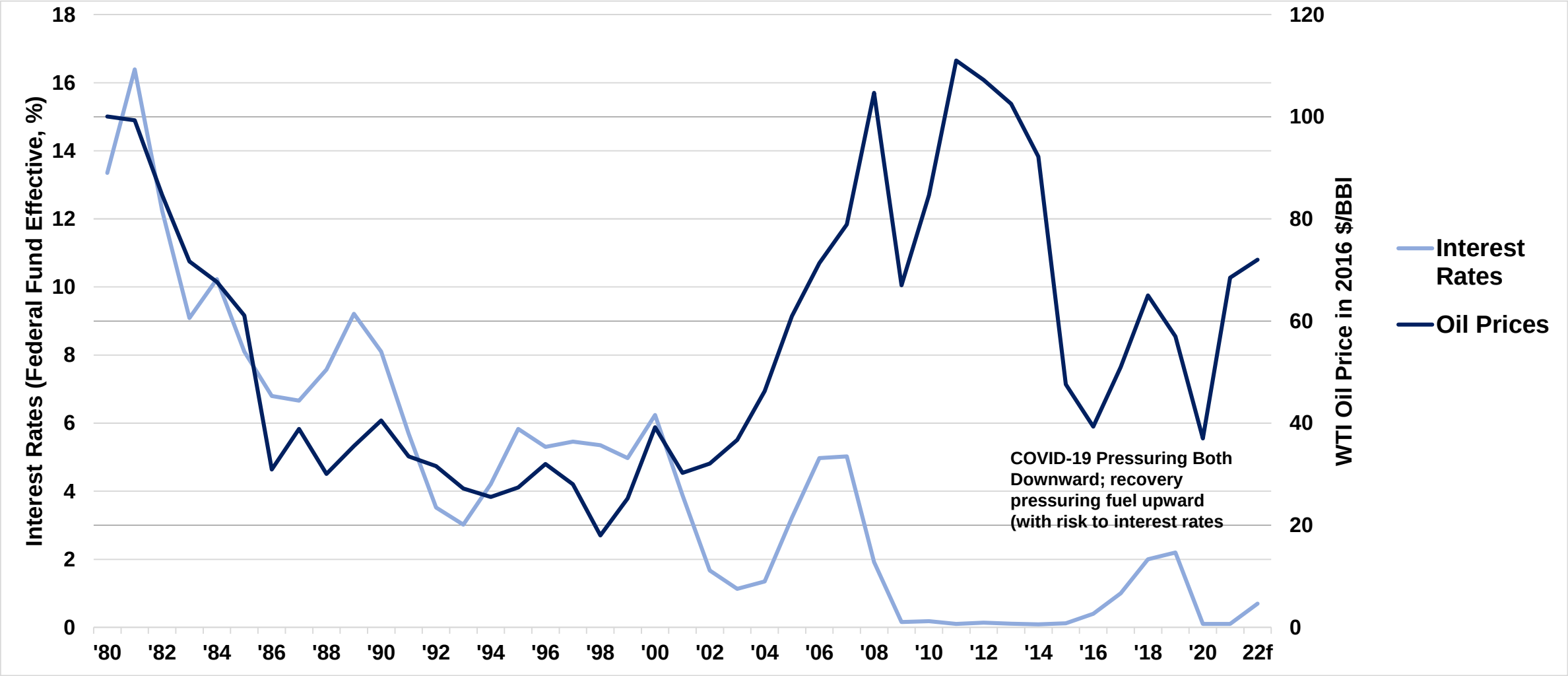


Forecast Revisions

1. Stronger 2021 summer season due to rapid vaccine rollouts and pent-up demand gives more positive overall 2022 outlook, even given Omicron wave
2. Omicron wave limits growth in Q1 2022, especially on international routes, but impact excepted to be short term
3. Uneven recovery in China from persistent COVID-zero strategy and low immunity balanced by stronger growth in flows receiving substitution demand (e.g. Central America-North America, Domestic U.S.)
4. IMF downward revision to GDP growth impairs 2025 – 2026 outlook, primarily in China

Source: AeroDynamic analysis, IATA

Ideally, Interest Rates Would be <3% and Oil Would Be $50-85/bbl; The Ratio Matters Most



Source: EIA, FRED

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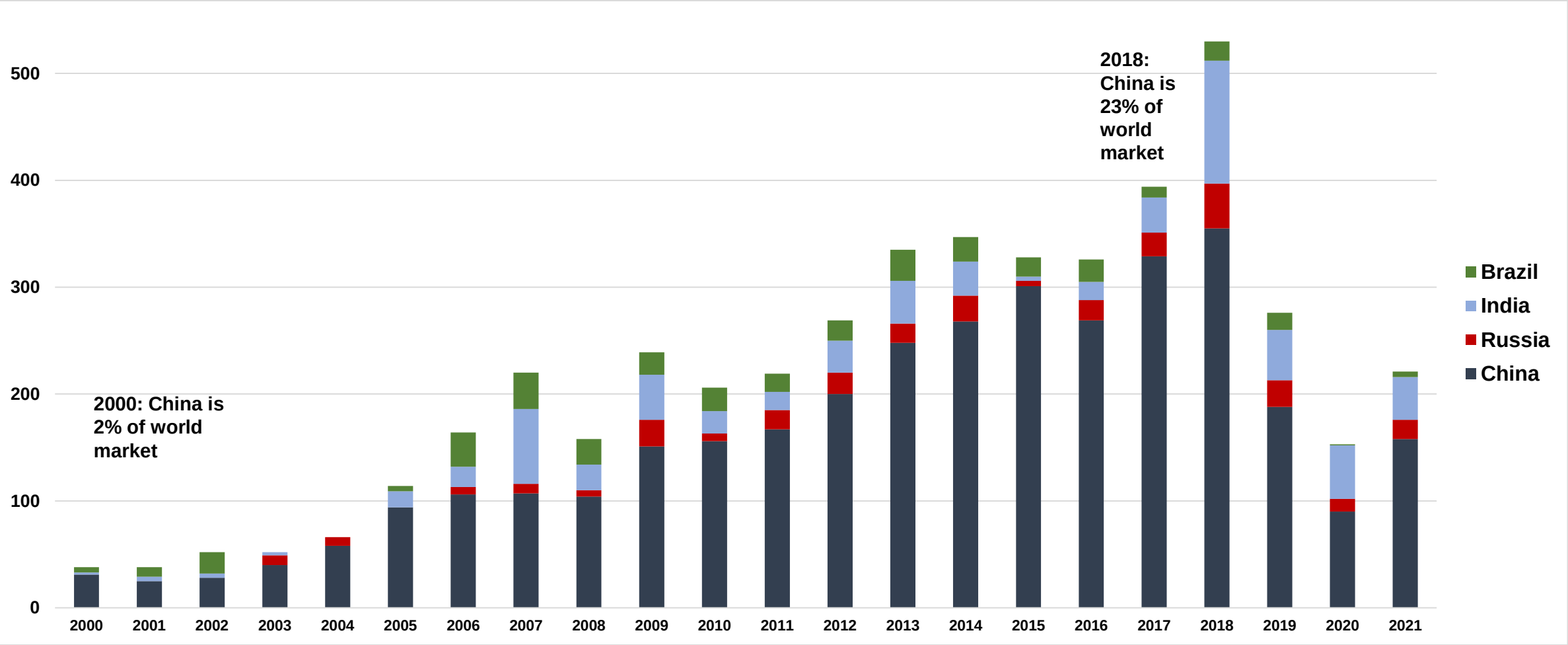
Single Aisle Rates Have Revolved Around China For Years…That's A Pre-COVID (and maybe Post-COVID) Problem

World market deliveries – China, India, Russia, Brazil, 2000 – 2021



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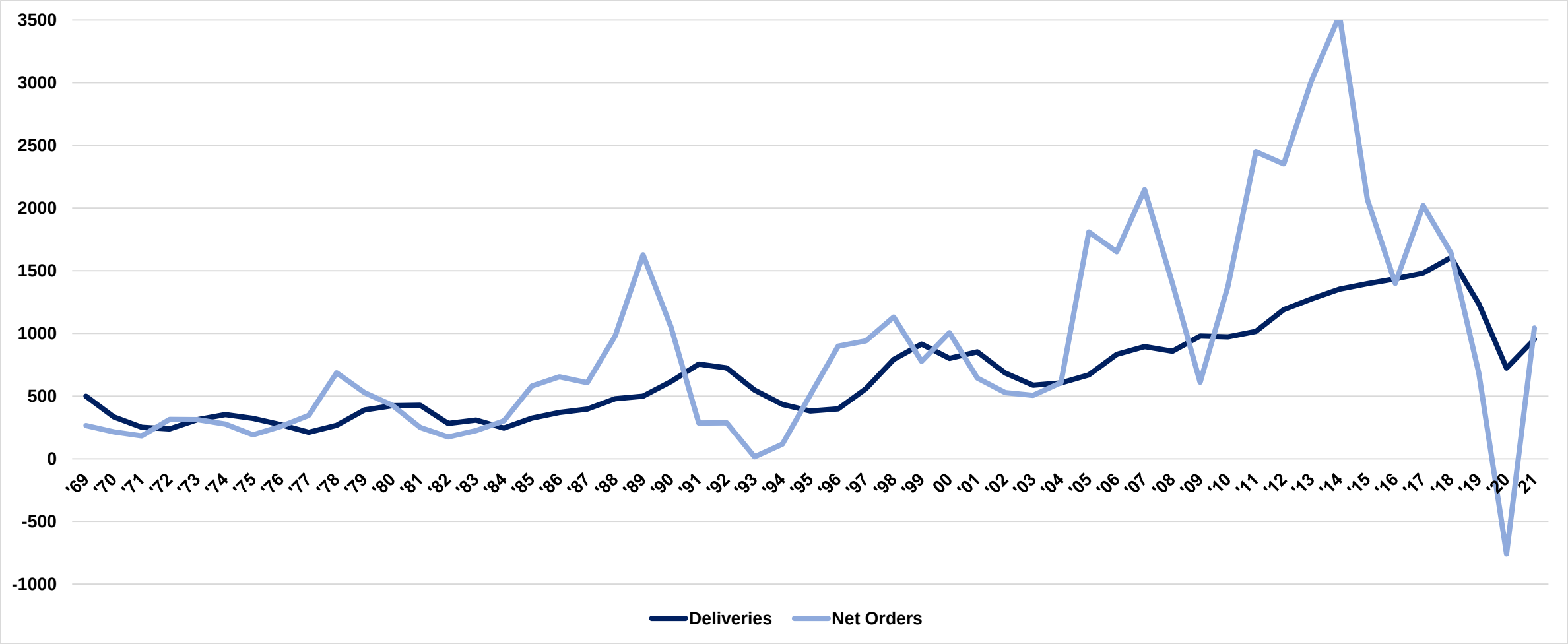
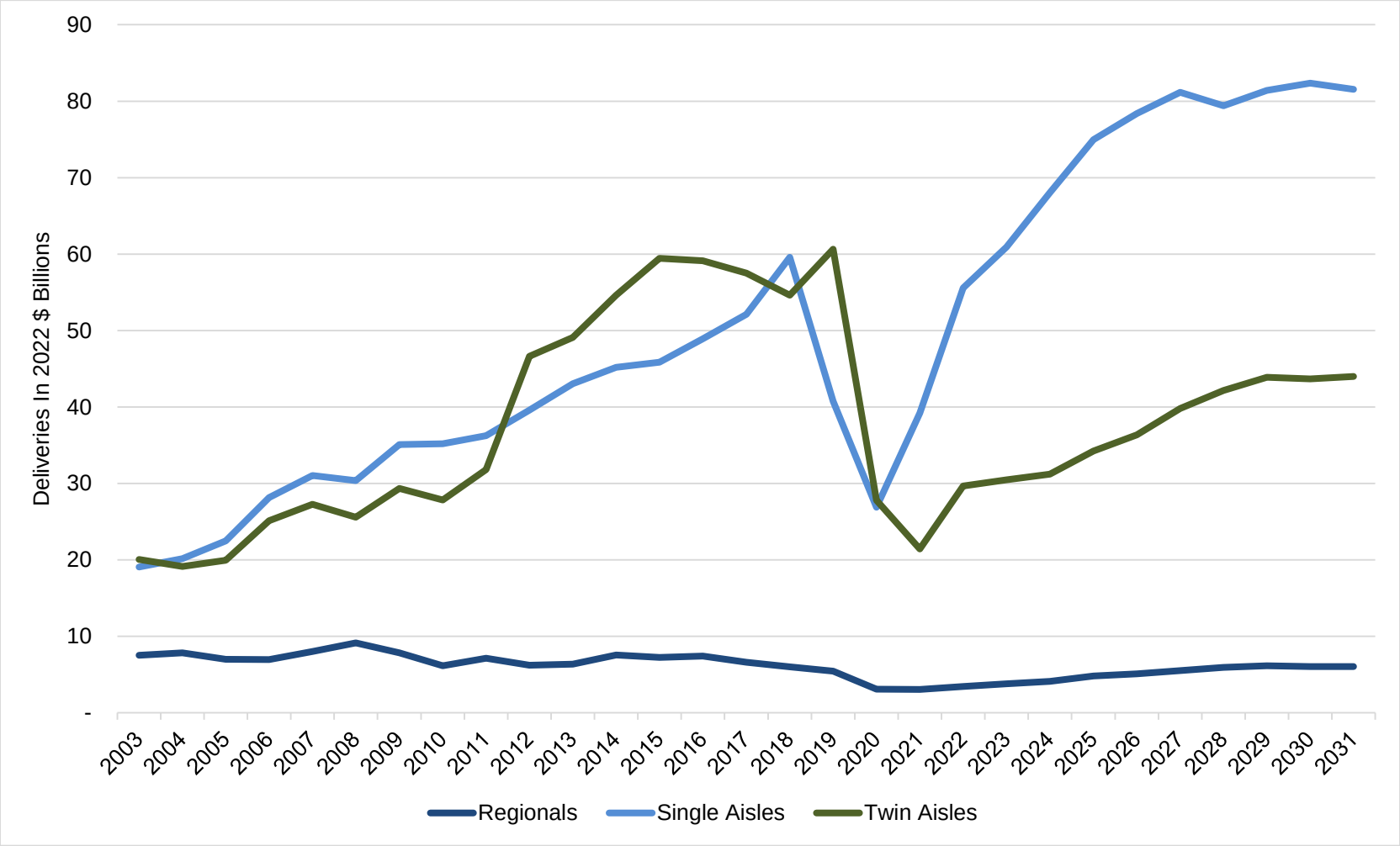
Good News: Book-To-Bill Is A Thing Again

Large Jetliner Orders and Deliveries, 1969 – 2021



Jetliners Coming Back in a Typical K-Shaped Recovery

Regional, Single Aisle, and Twin Aisle Deliveries, 2003 – 2031



› <u>Single aisles:</u>
- Recovery accelerated by 737MAX return to production and delivery of ~450 already-built jets; Airbus rate 60+, then ~70.
- Return to peak by 4Q 2022.

› <u>Twin aisles:</u>
- Sharp increase in the 2010s due to influx of new aircraft.
- Too much too sudden: A330s, 777s, 787s, and Gulf carriers
- Hit hardest and longest due to capacity hangover; international traffic being hit hardest and longest; shift towards single aisles
- Return to peak after 2031… probably.

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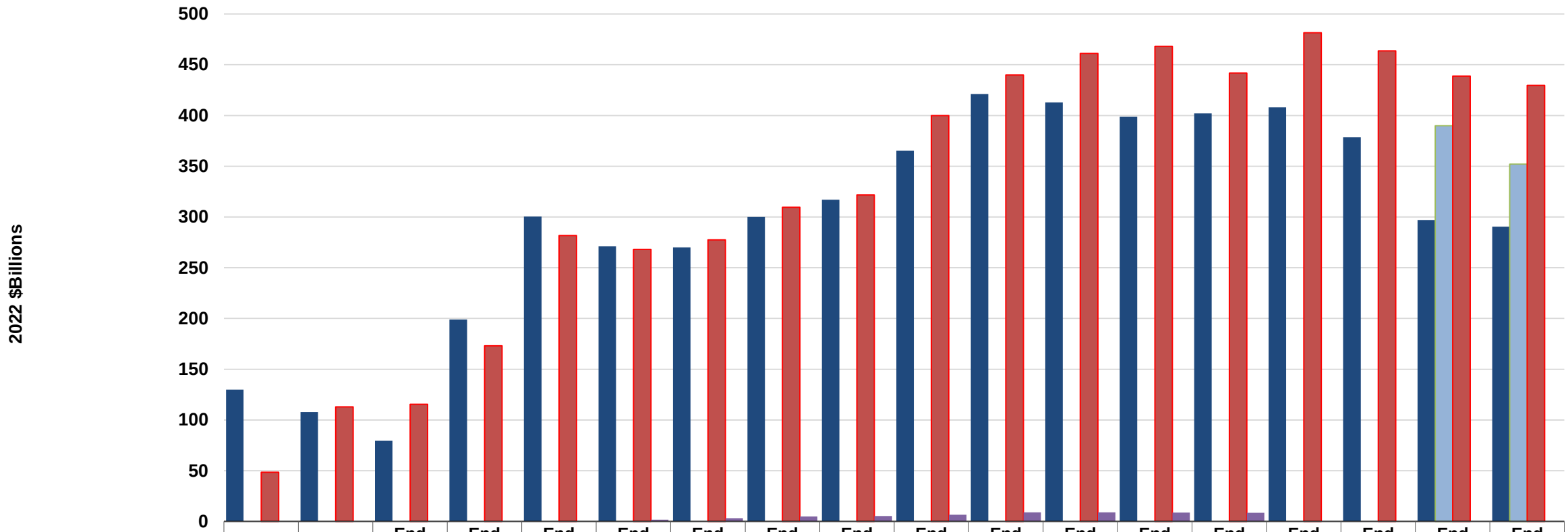
Boeing Has Taken a Hit in Backlog Share Over The Past Five Years

With and Without ASC606 Provisions

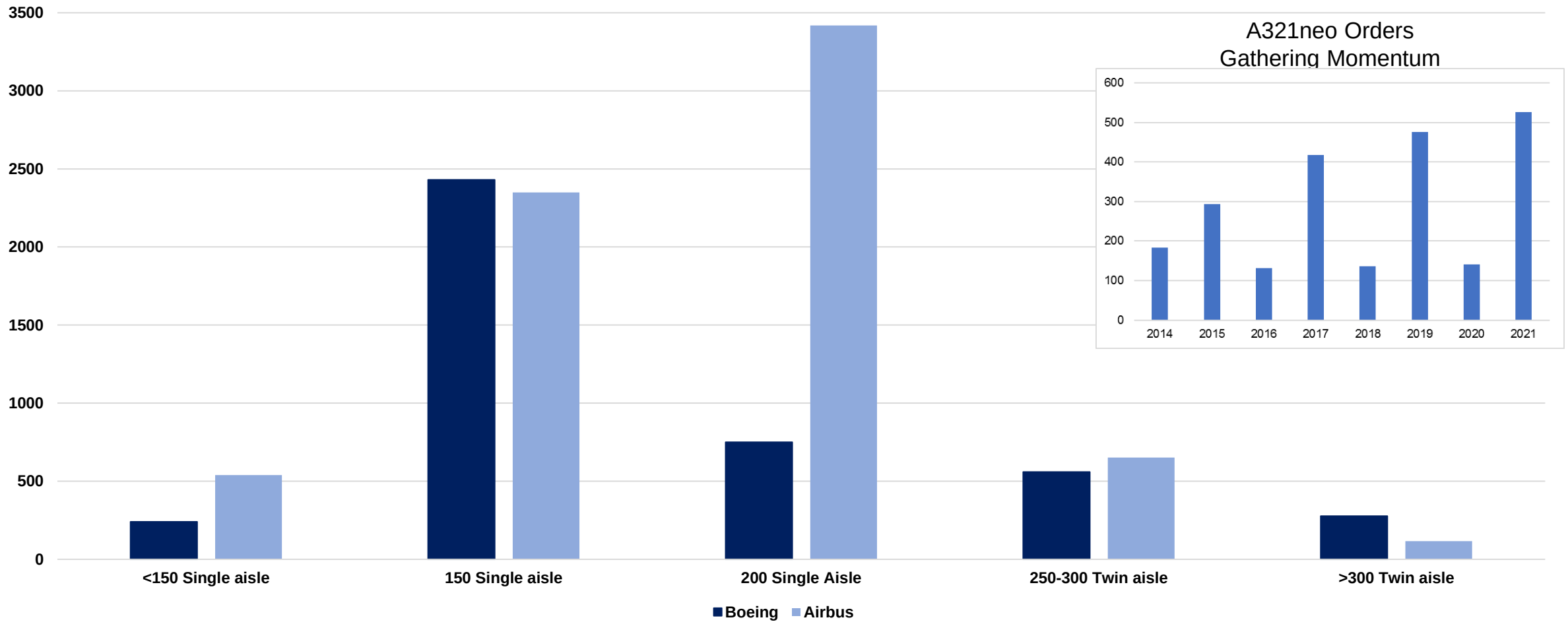
Firm Order Backlog, 1997 – 2021



	1h 1997	1h 2001	End 2004	End 2006	End 2008	End 2009	End 2010	End 2011	End 2012	End 2013	End 2014	End 2015	End 2016	End 2017	End 2018	End 2019	End 2020	End 2021
Boeing	130.0	107.8	79.5	199.1	300.4	271.1	270.0	300.1	317.0	365.3	421.2	412.9	398.9	402.1	408.0	378.8	297.1	290.4
Without ASC 606																	390.0	352.0
Airbus	48.6	112.9	115.5	173.0	281.8	268.2	277.6	309.5	321.6	399.9	439.9	461.2	468.1	441.8	481.6	463.6	438.9	429.6
Bombardier	—	—	—	—	—	1.9	3.3	4.9	5.5	6.7	9.0	9.0	8.7	8.5	—	—	—	—

It's All About The Middle Market, Which Airbus Increasingly Controls

Airbus and Boeing Jetliner Backlogs, End 2021



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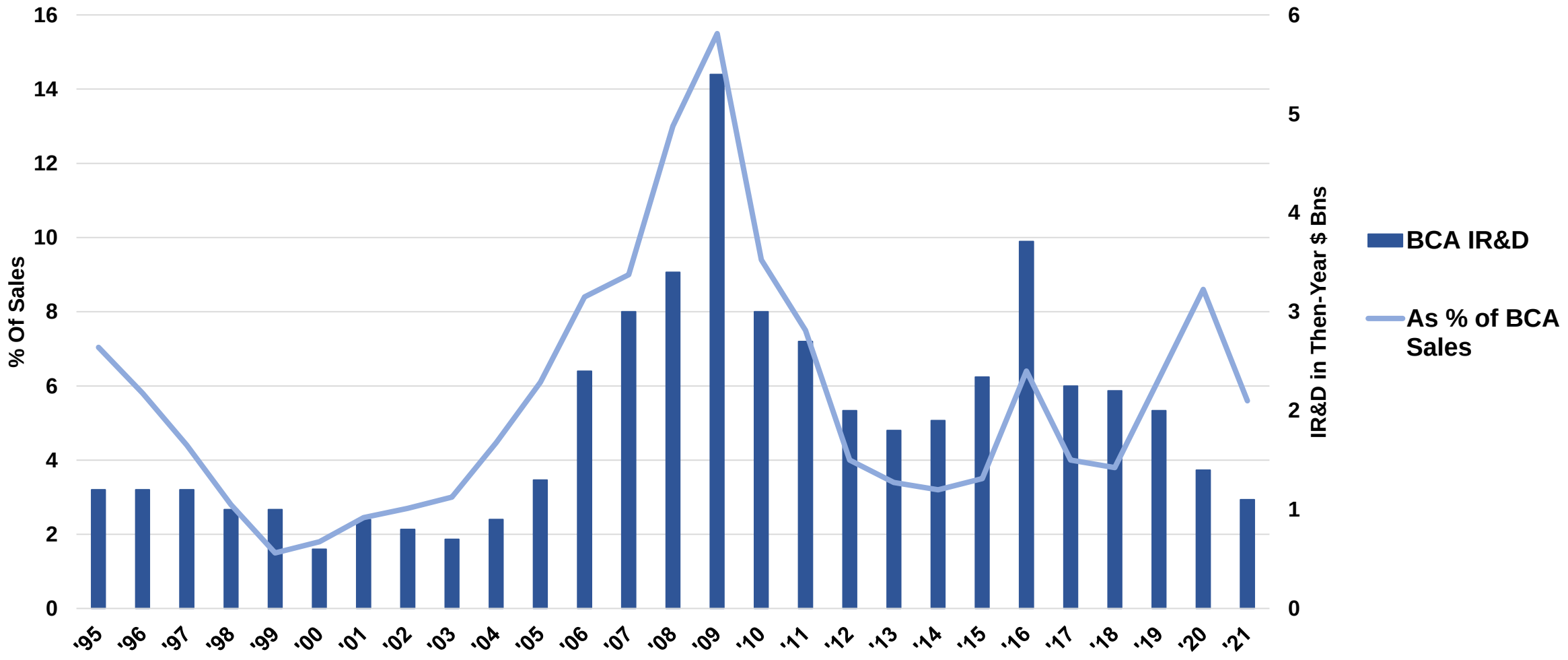
Boeing Commercial IR&D Under Pressure Again

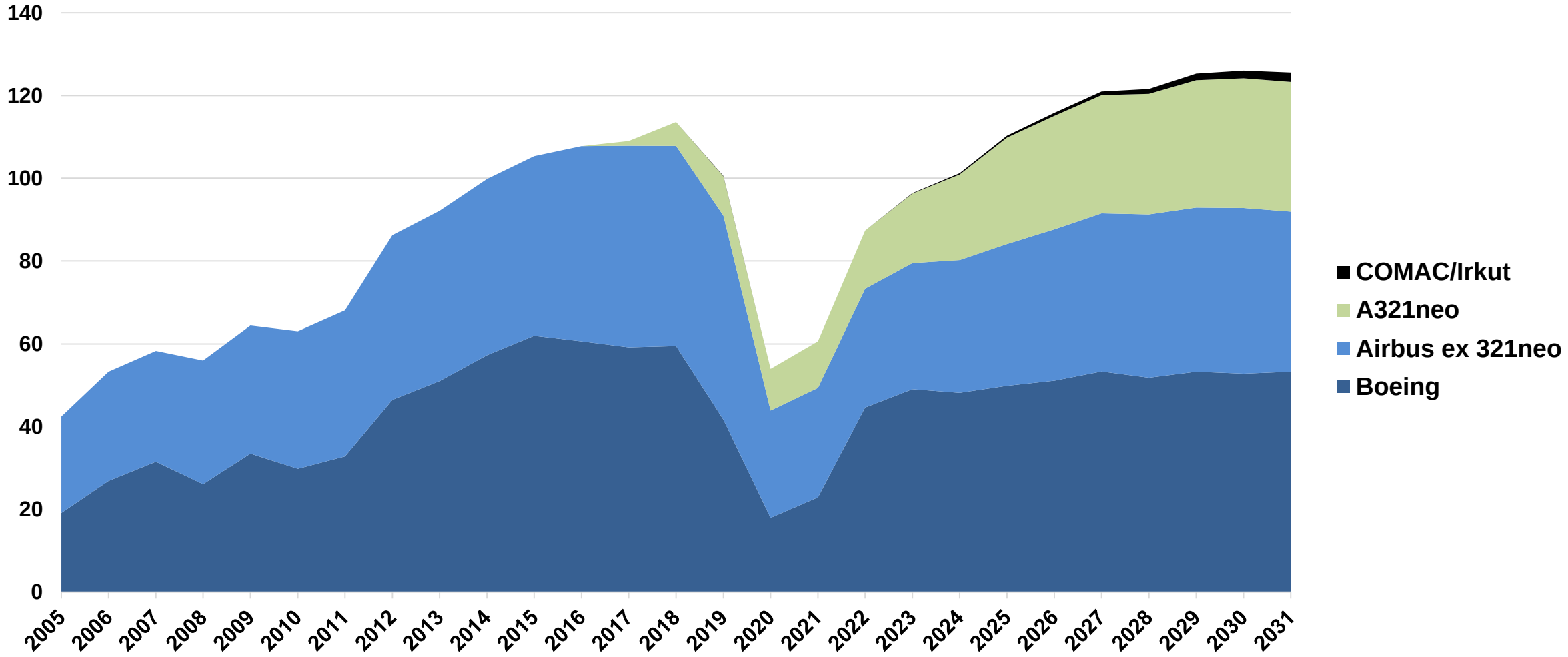
Right When They Need A New Jet, And Face Demographic and Inflation Challenges

Boeing IR&D in $ and % of Sales, 1995 – 2021



Airbus Seizes Middle Market and First Place as Middle Market Grows

Jetliner Market Shares by Deliveries, 2005 – 2031; 2022 $ Billions



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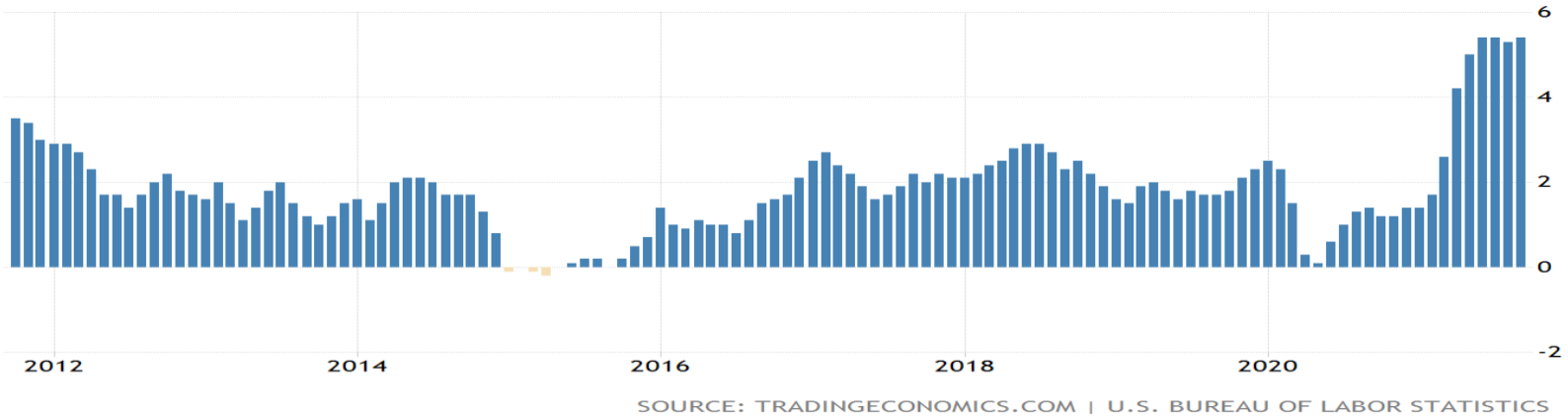
Usually, Commercial Aviation Leads the Way In An Economic Recovery…Not This Time

- Commercial aviation will be late to the recovery
- It will be last in line to make capital investments, and to hire workers
- Inflation may compound this problem
- High defense spending is another complication
- High defense RDT&E, plus other civil developments, make new civil products difficult

Nondefense Capital Goods Spending (Excluding Aircraft)

US Inflation, 2012 – 2020



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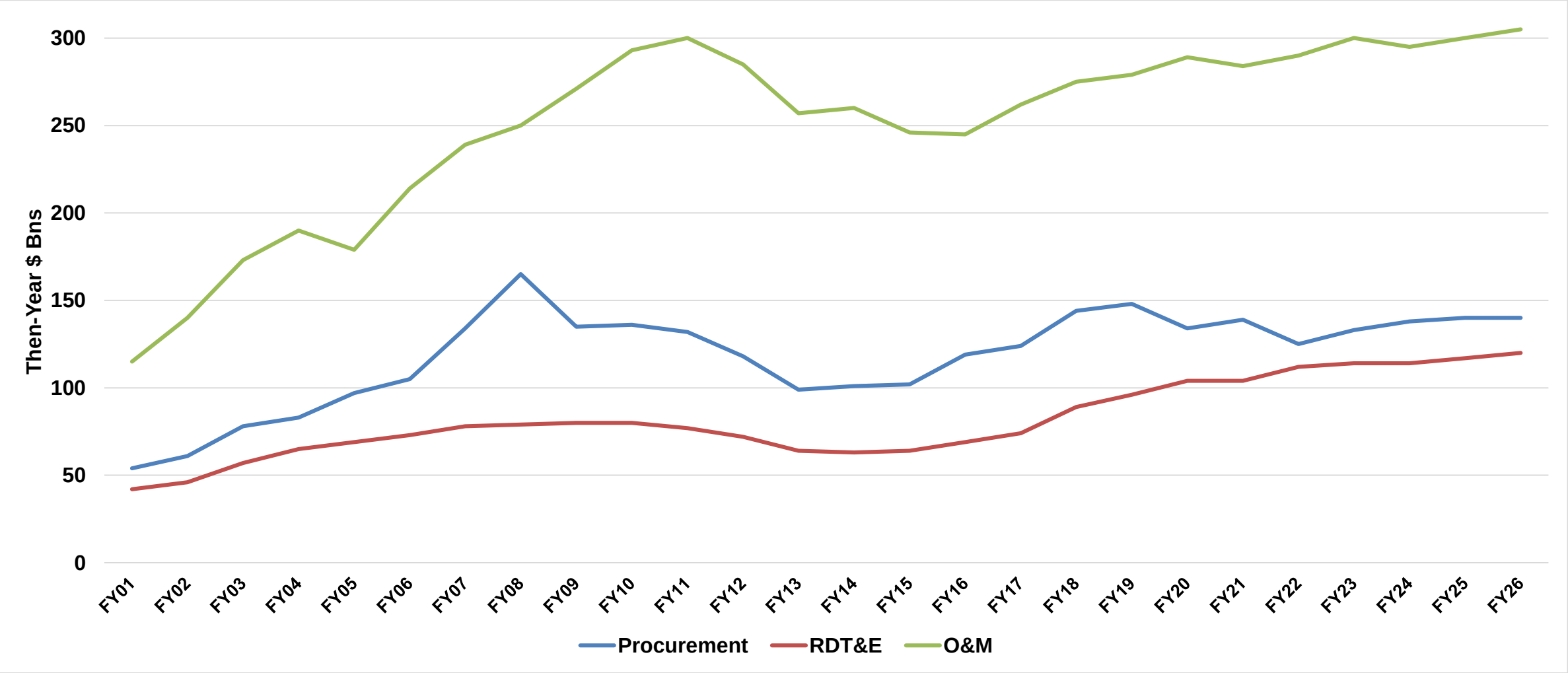
DoD Investment: Much Better Than In The Last Jetliner Downturn

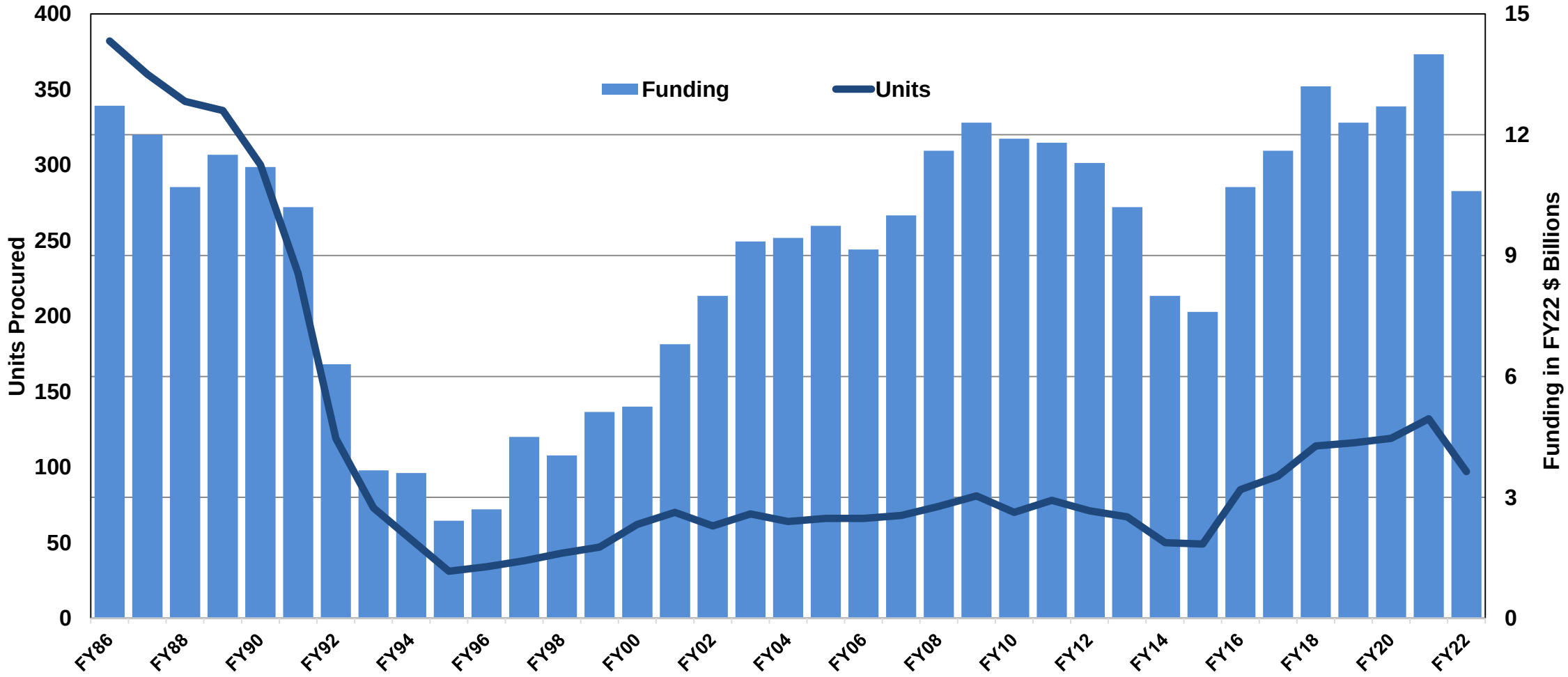
RDT&E particularly strong – record levels



Source: DoD, AeroDynamic

DoD Tactical Aircraft Procurement, FY86-22; Tough Choices Ahead

Options: Buy More, Buy Different (fast trainers, Gen 4.5), Cut Force Structure, Spend More on Upgrades



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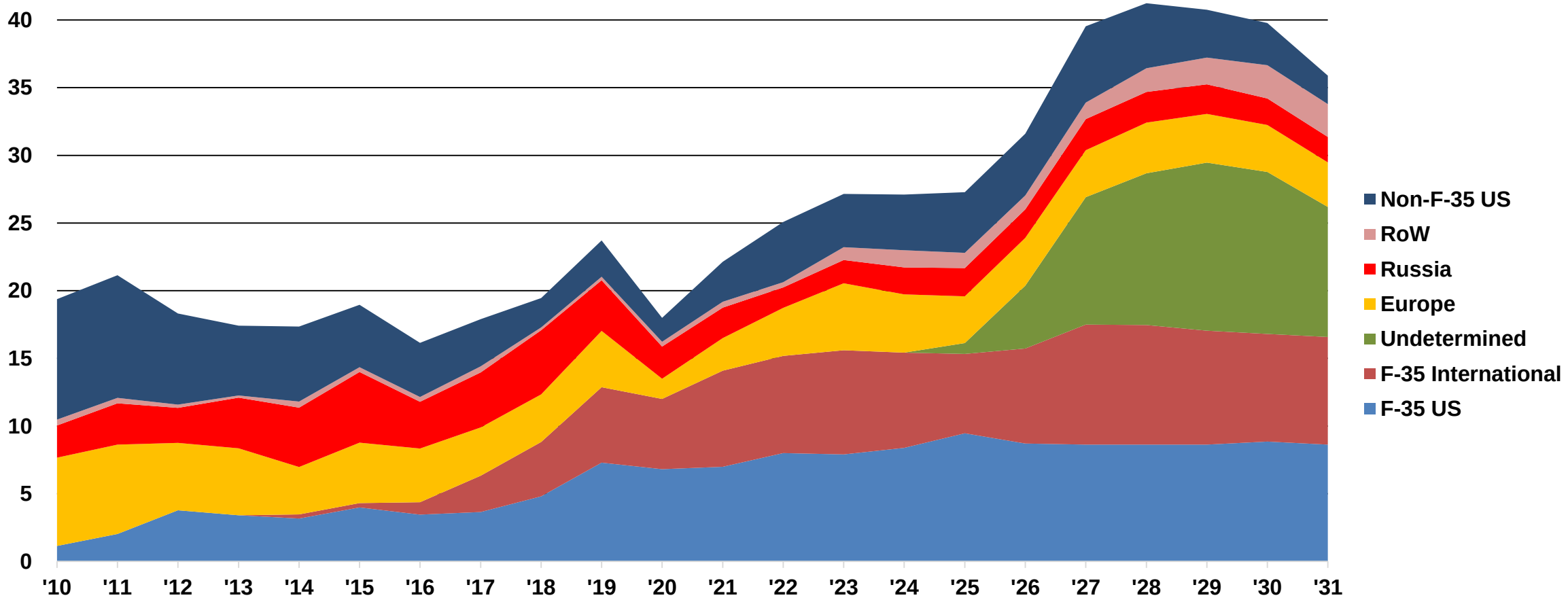
Strongest Market In Aviation, With Strong Ancillary Spending

Big Questions: F-35 Peak, NGAD readiness

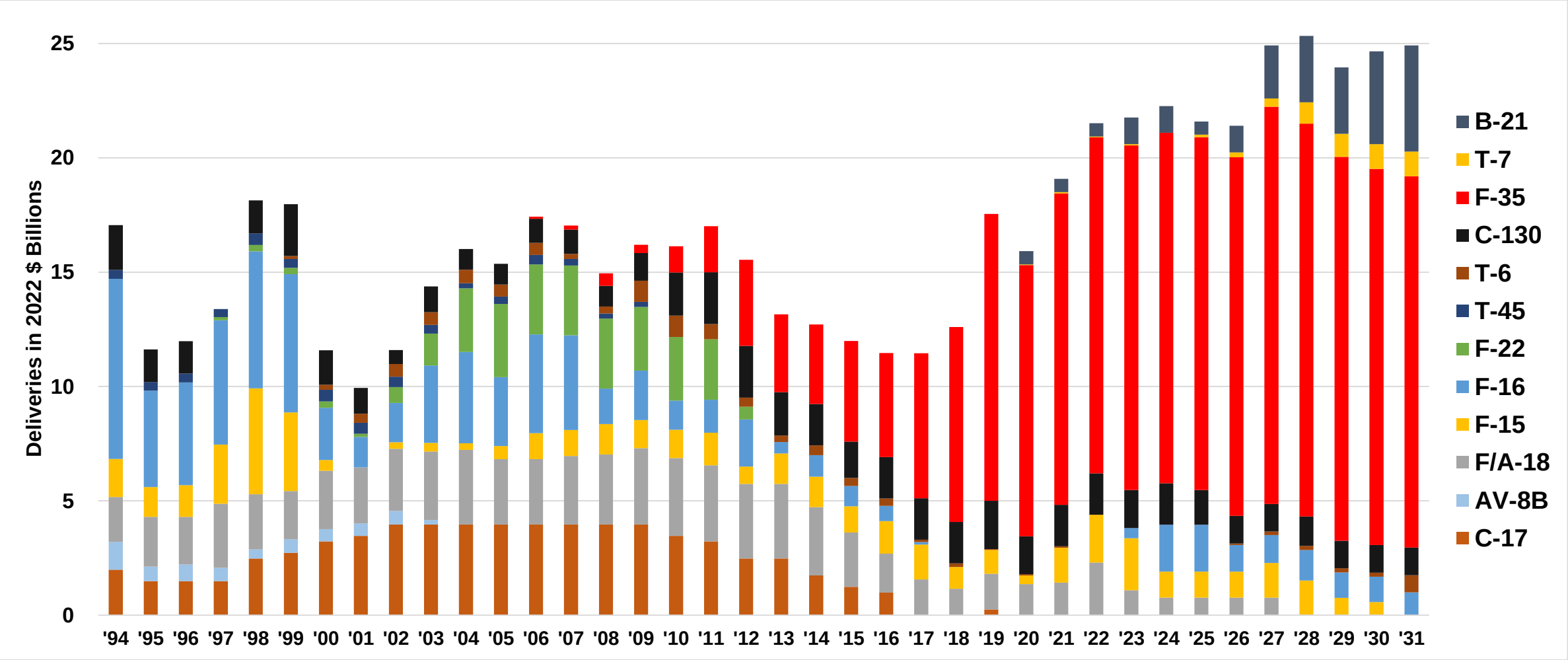
Deliveries Revenue by Platform, 2022 $ Bns



F-35 Dominates, But Legacy Programs Still Alive; B-21, T-7 In View Too

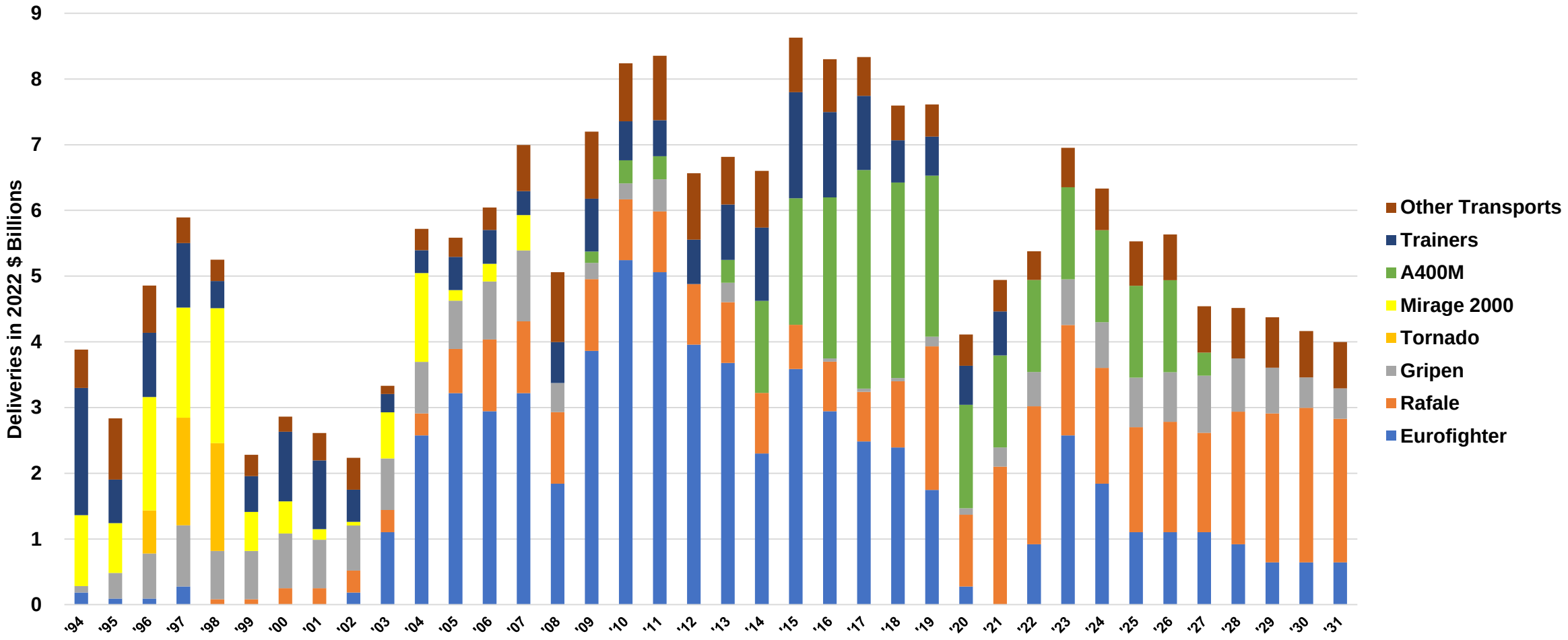
Big Question: NGAD

Deliveries Revenue by Platform



Europe: Coping Without a Fifth Gen…Germany, France, UK Program Decisions Loom

Deliveries Revenue by Platform



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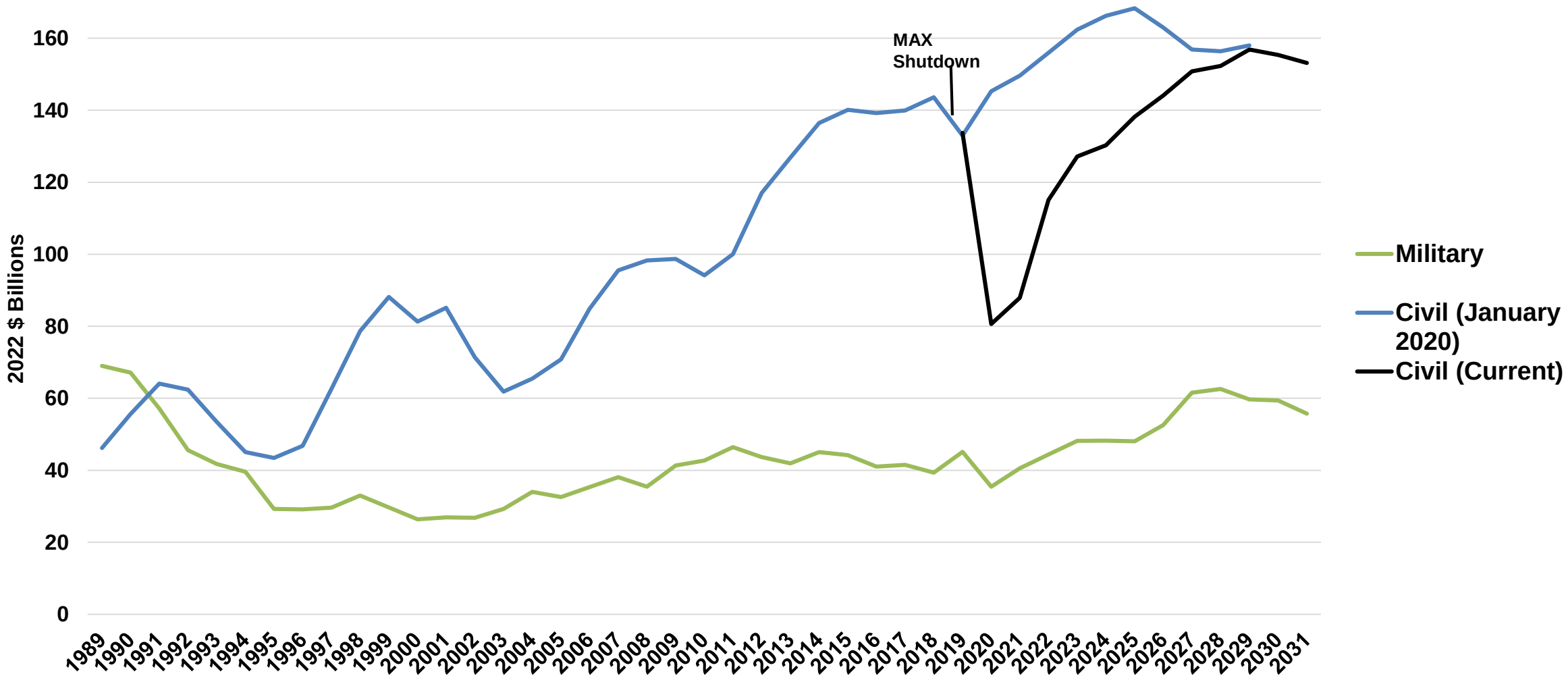
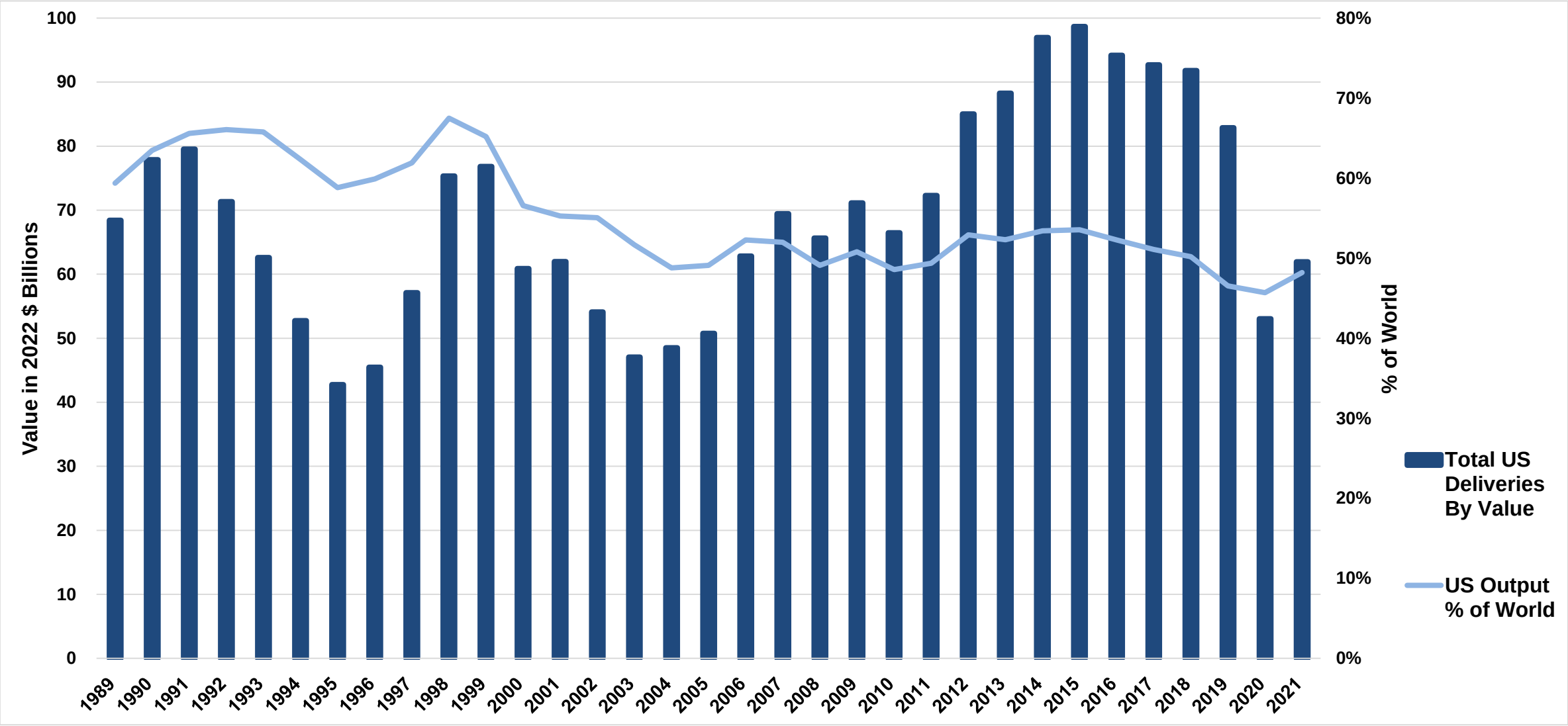
The Industry Is Climbing Out Of An Unexpected Pit

World Aircraft Deliveries by Value, 1989 – 2031



US Beginning A Slow Recovery, Led by Military Segment

US Industry output relative to the rest of the world, 1989-2021



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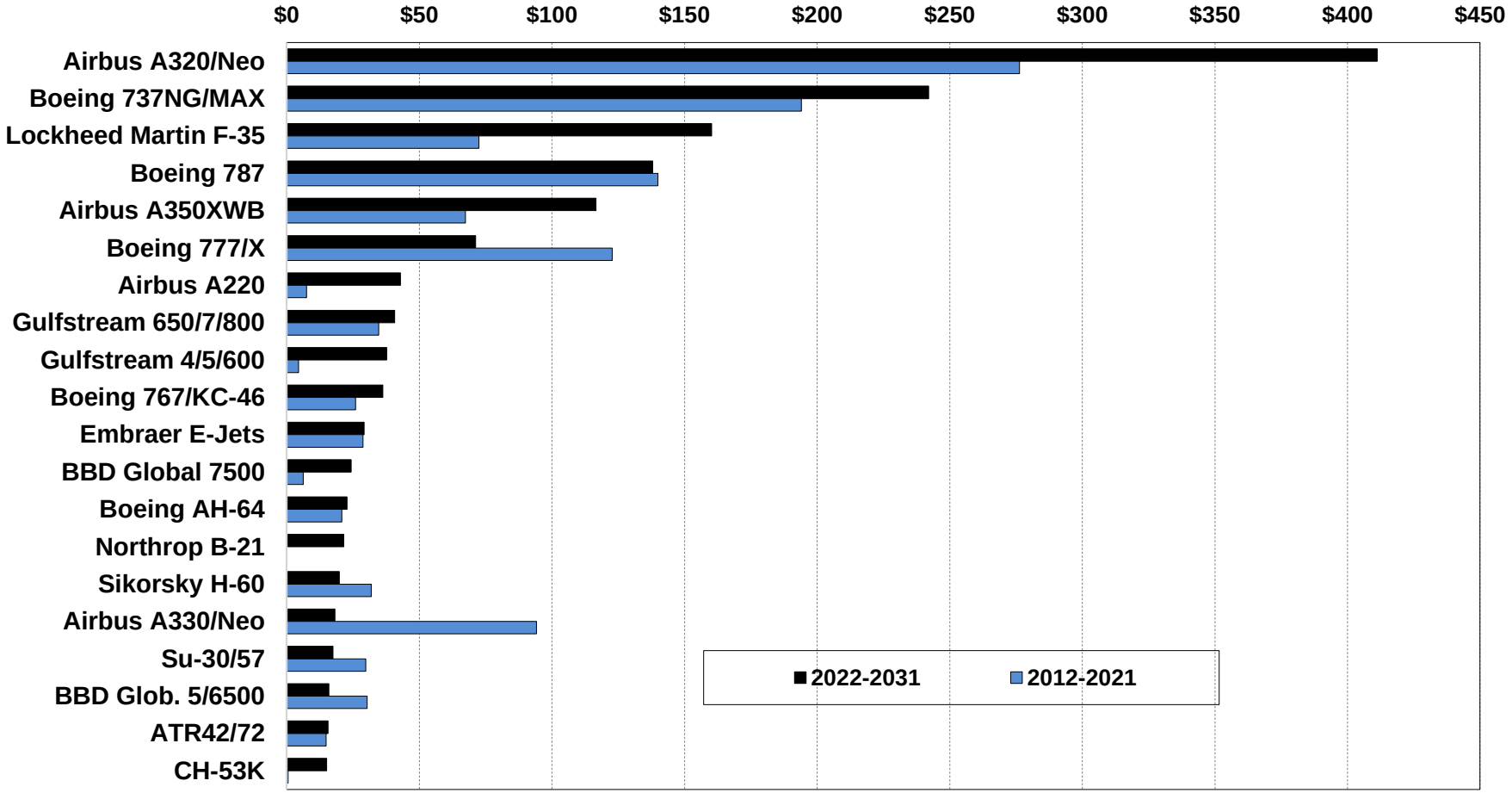
The Market Is More Concentrated Than Ever

Top 5 platforms are 55% of total; next 15 are 22%; remaining 100+ are 23%; A320/321 dominates

Cumulative deliveries value, top 20 aviation programs, 2012-2021 v. 2022-2031

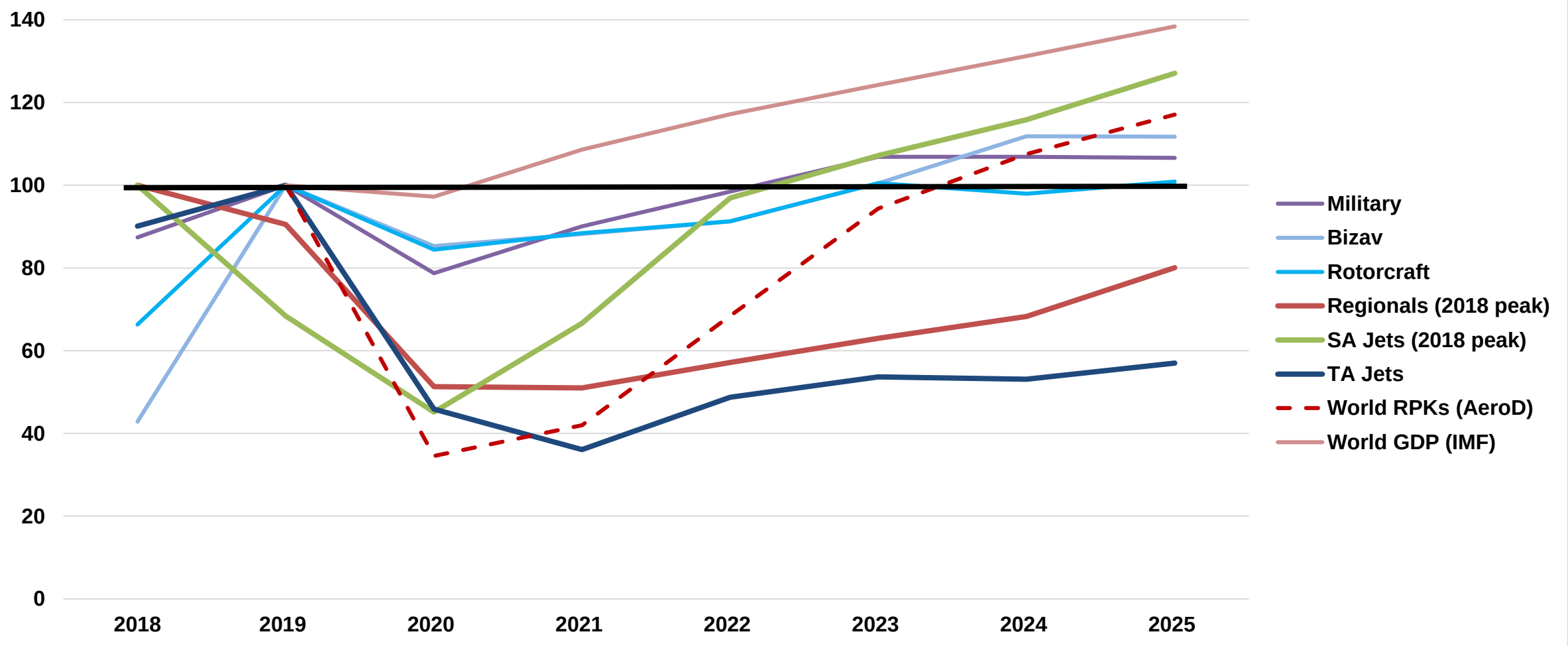


- Persistent Barriers To Entry.
- Legacy platforms predominate.
- Off chart but coming next decade: NGAD Tempest, SCAF, FLRAA, and just maybe a new Boeing jet.
- I don't think AAM is coming to this chart anytime soon.

Divergent recovery paths

In Two Years, the COVID Downturn will be viewed as a day of reckoning for twin aisles; for everything else it will be seen as relatively brief and not particularly severe

Segment Deliveries by Value Compared to Peak Years (% of 2019/ 2018 for some segments)



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Thank You!

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