

World Aero Markets: Looking Up, From The Bottom of a Pit

Presentation to the ACM Presidents Meeting

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Aviation Segments By Damage

Most to Least
Annotated,
Ten Months In

Twin aisle jetliners	<p>International traffic hit hardest and longest. Already an overcapacity situation. Secular shift towards single aisles already underway.</p> <p>It's just that bad.</p>
Single aisle jetliners	<p>Fuel prices a big problem. China comeback uncertain. Some relief due to deferred Airbus ramp, and MAX stop.</p> <p>Same.</p>
Business Jets	<p>Large cabin strongly correlated with oil prices. Small/medium strongly correlated with corporate profits, equities indices.</p> <p>Might recover quickly; still a 2020/21 downturn</p>
Civil Rotorcraft	<p>Oil and gas segment (large) hit again, before recovery even began.</p> <p>About right...wait and see.</p>
Military Programs	<p>Emphasis on "shovel-ready." Advance development programs at greater risk. Pure-play contractors in best shape; suppliers with most defense in best shape.</p> <p>All good. In fact, better.</p>

Aircraft Markets, In Good And Bad Years

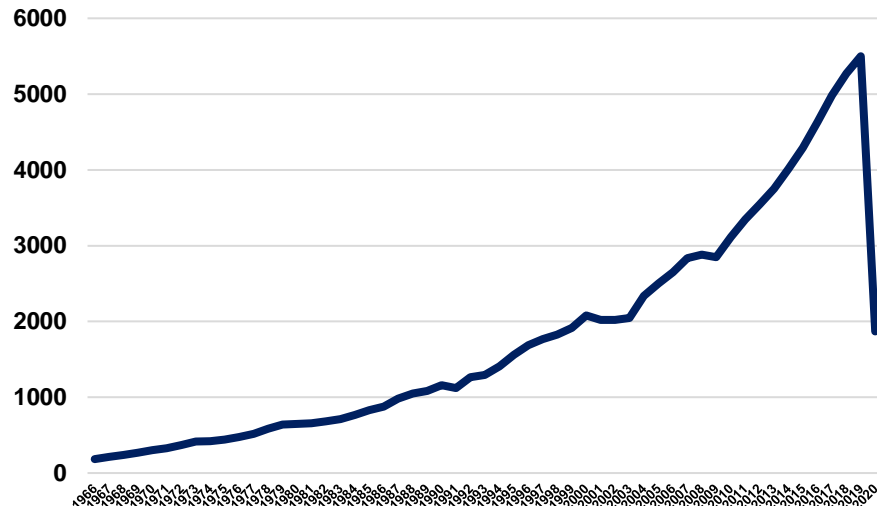
(last year was not good)

<u>World New Deliveries</u>	<u>CAGR</u>	<u>CAGR</u>	<u>CAGR</u>	<u>Change</u>
<u>In 2020 (2021 \$)</u>	<u>'03-'08</u>	<u>'08-'14</u>	<u>'14-'19</u>	<u>'19-'20</u>
Jetliners-SA (\$27 b)	9.7%	6.9%	-2.0%	-54.8%
Jetliners-TA (\$27.8 b)	5.0%	13.5%	2.1%	-49.1%
Regionals (\$3.4 b)	3.9%	-3.1%	-6.3%	-47.8%
Business Aircraft (\$18.2 b)	16.7%	-2.2%	-1.2%	-15.7%
Civil Rotorcraft (\$3.1 b)	18.5%	-2.5%	-7.2%	-11.4%
Military Rotorcraft (\$10.7 b)	10.6%	9.7%	-7.0%	-16.3%
Military Transports (\$4.1 b)	3.2%	-0.9%	0.0%	-27.0%
Fighters (\$18.3 b)	1.6%	0.8%	6.1%	-22.6%
<u>All Civil</u> (\$79.9 b)	<u>9.7%</u>	<u>5.6%</u>	<u>-0.5%</u>	<u>-40.0%</u>
<u>All Military</u> (\$36.9 b)	<u>3.9%</u>	<u>4.1%</u>	<u>0.0%</u>	<u>-18.4%</u>
<u>Total</u> (\$116.7 b)	<u>8.0%</u>	<u>5.2%</u>	<u>-0.4%</u>	<u>-34.5%</u>

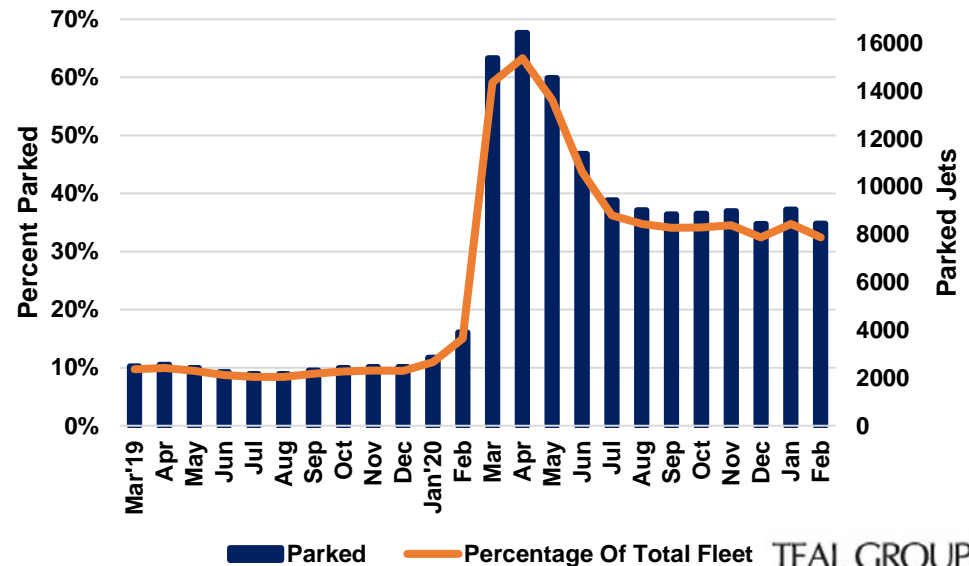
More Unprecedented Numbers

- Traffic decline, parked fleet like no previous shock.
 - Per Paul Krugman, reflect a world economy recovering from a “medically-induced coma.”
- Backlogs holding up (MAX a concern), but meaningless in a downturn.
- Many early retirements coming, particularly twin aisles.
 - Primarily twin aisles; A380 bloodbath.
- Aftermarket catastrophe – ASK decline, plus de-stocking, deferred maintenance, early retirements, USM, engine swapping, etc.

World Air Traffic (RPM Bns)



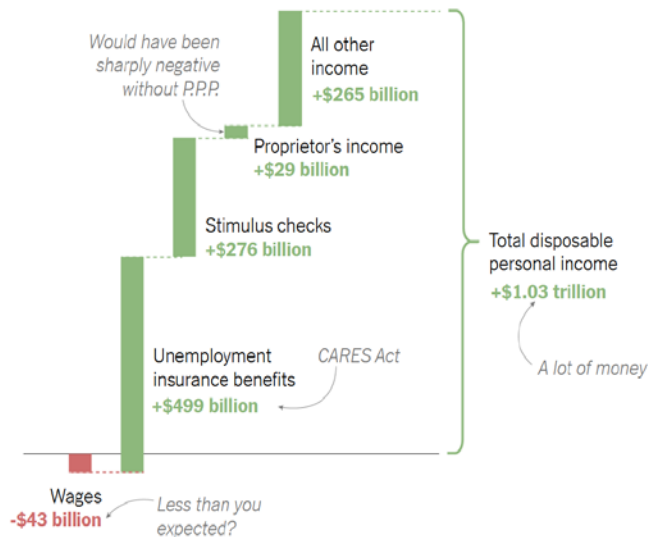
World Jet Fleet: Stuck At ~30% Unemployed



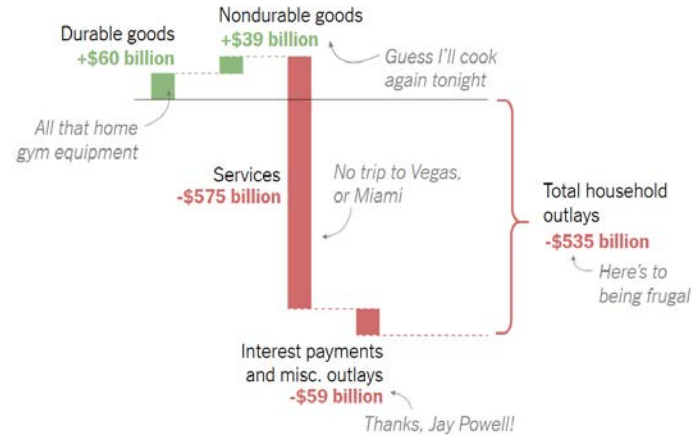
Traffic Peak Recovery By Late 2022. Why?

- Better-than-expected vaccine efficacy.
- Better-than-expected economic outlook.
- The China domestic comeback.
- Business travel resurgence.
- Vacation travel resurgence, fueled by record savings rates.

Personal income increased

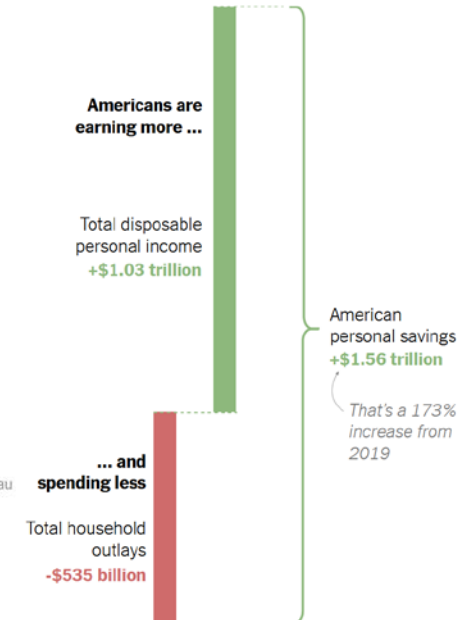


Spending decreased



Note: Data from March to November 2020 compared with the same time period in 2019. Source: Bureau of Economic Analysis

Americans are saving a lot of money

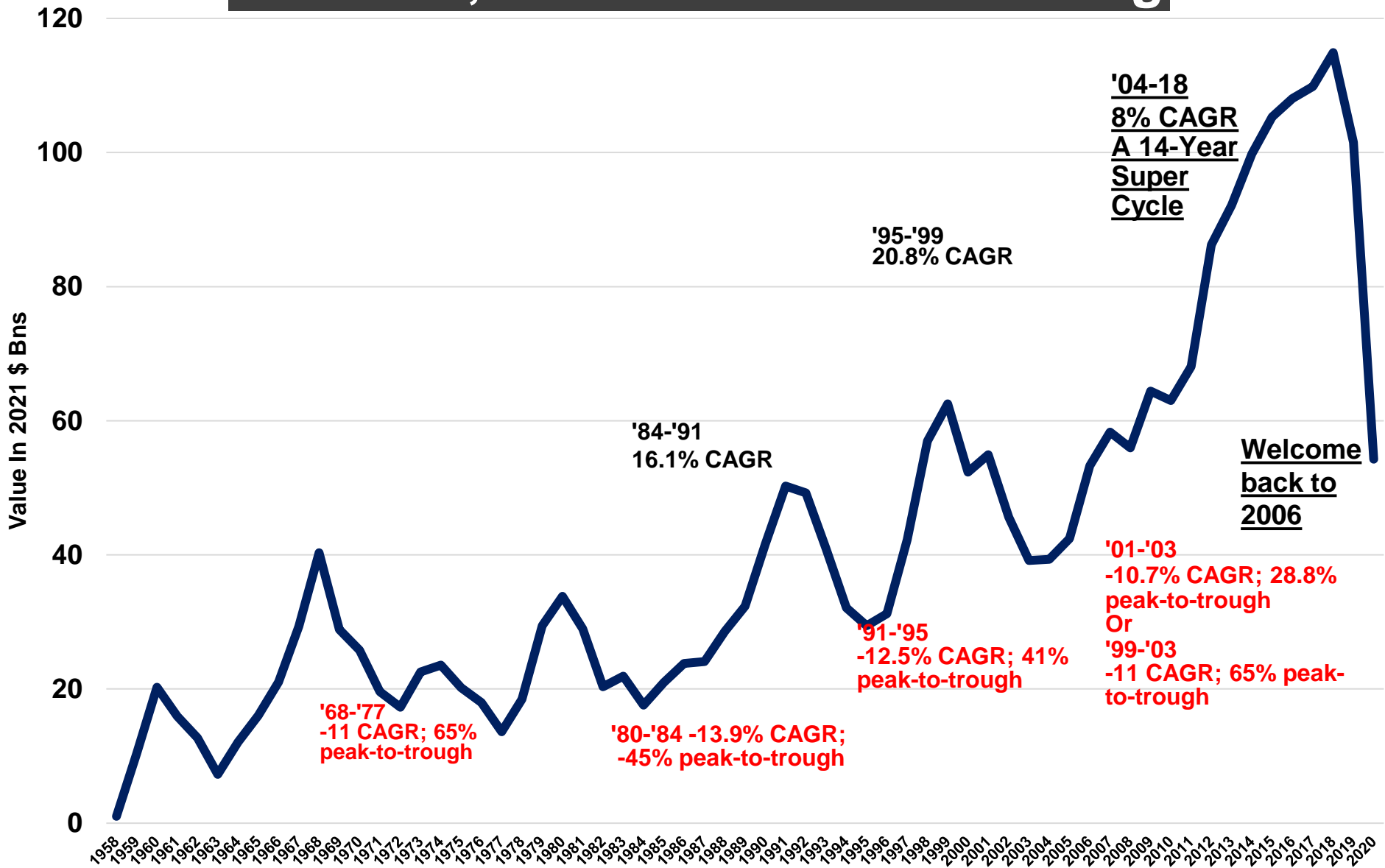


Note: Data from March to November 2020 compared with the same time period in 2019. Source: Bureau of Economic Analysis

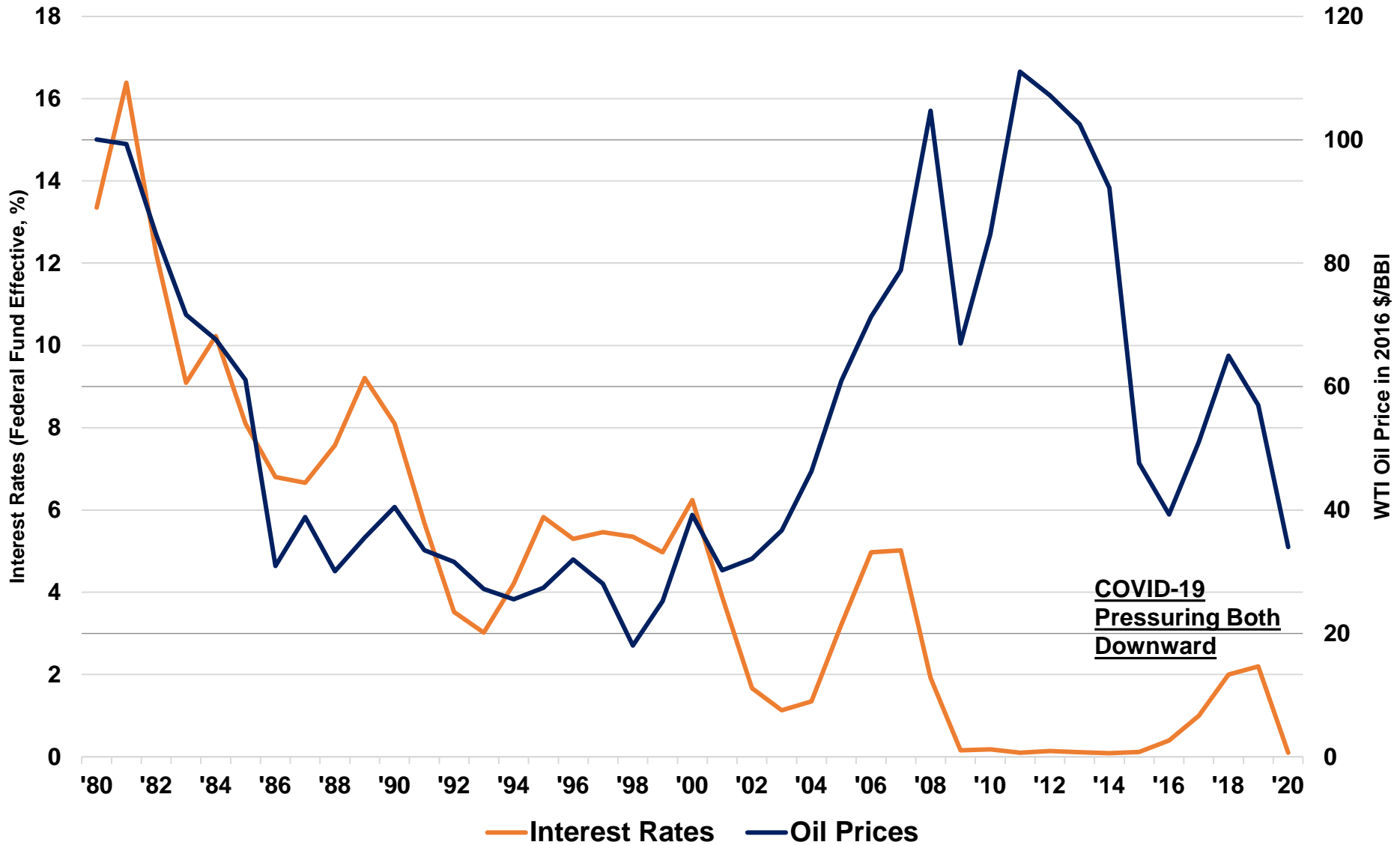
Note: Data from March to November 2020 compared with the same time period in 2019. Source: Bureau of Economic Analysis

<https://www.nytimes.com/2021/01/01/upshot/why-markets-boomed-2020.html>

Here It Is, The Chart I Was Dreading

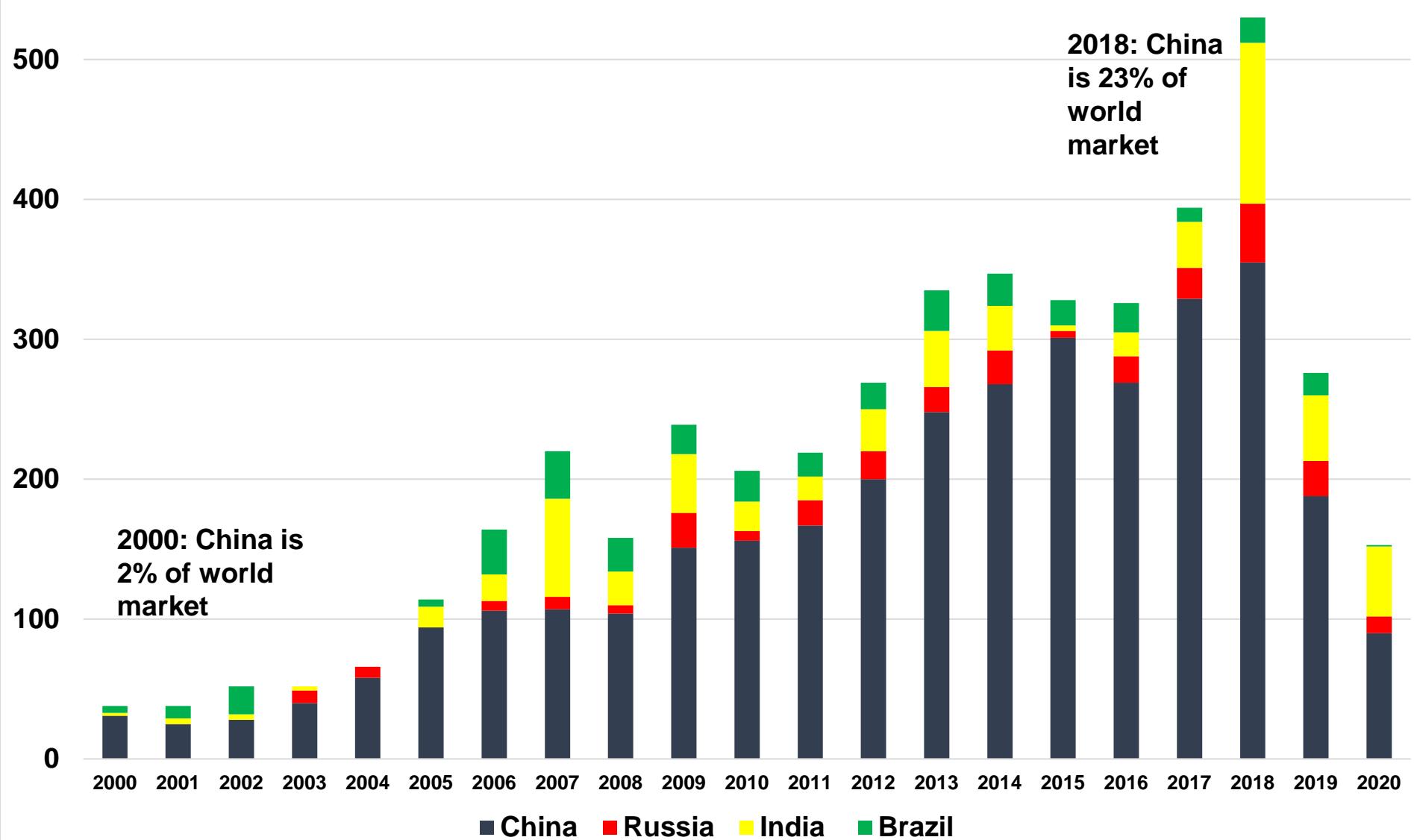


Interest Rates And Oil Prices: Less Than 4%, And \$50-85/bbl, Ideally; But The Ratio Matters Most

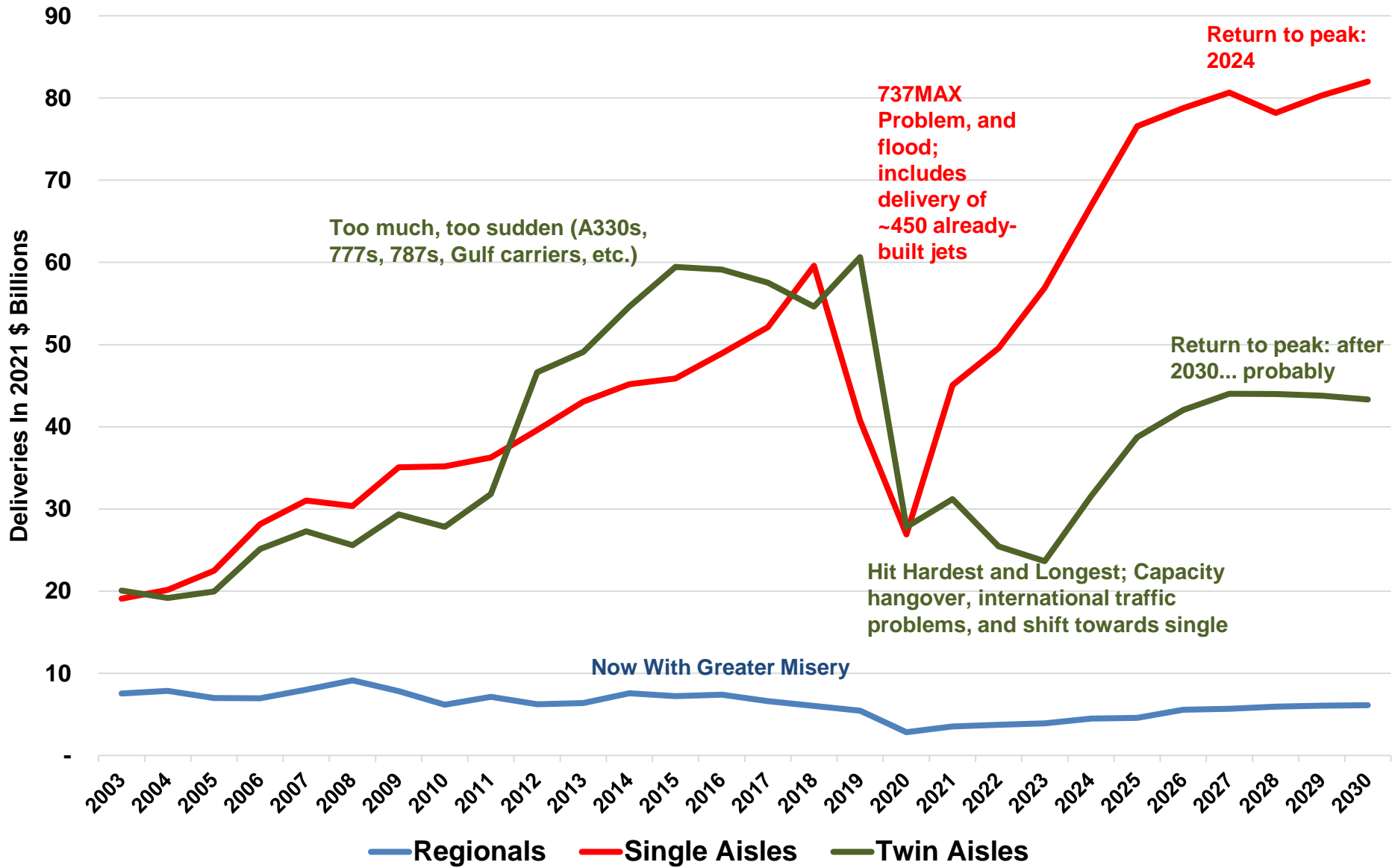


COVID-19
Pressuring Both
Downward

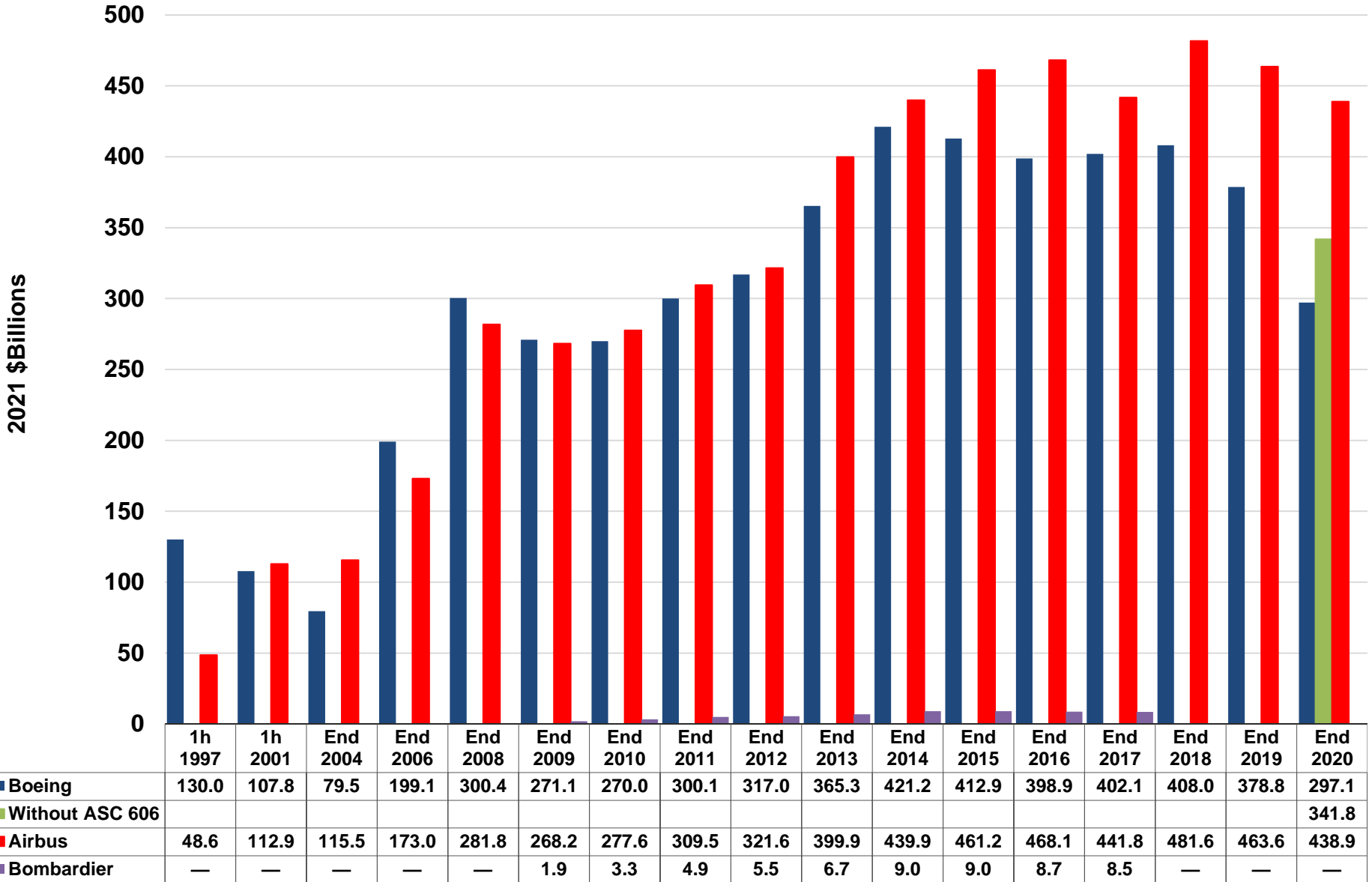
BRIC Deliveries: All About China



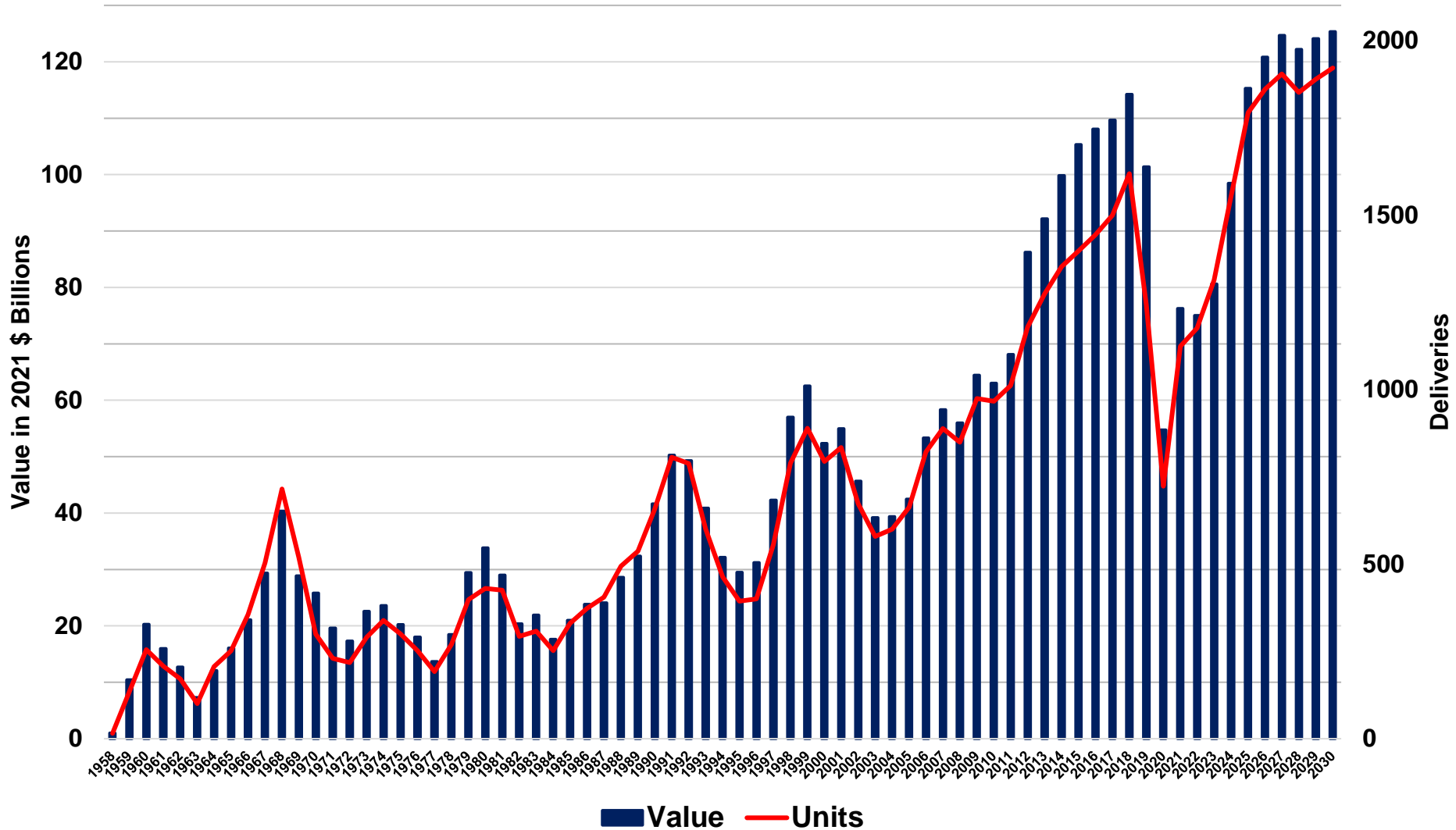
The Air Transport Market By Segment



Firm Order Backlog Values: Boeing Taking A Hit

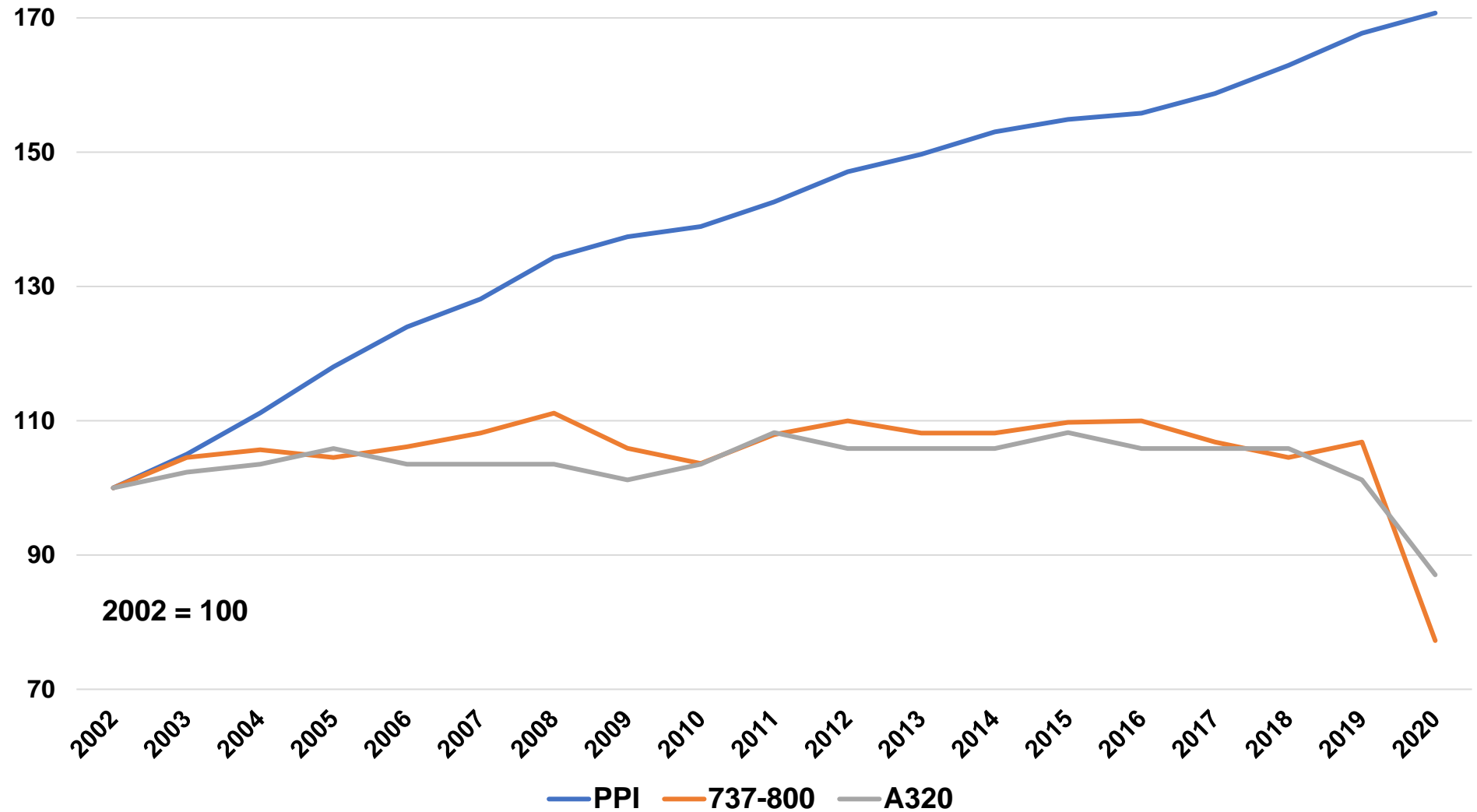


We'll Get Back To The Road We Were On (as long as we're talking single aisles)

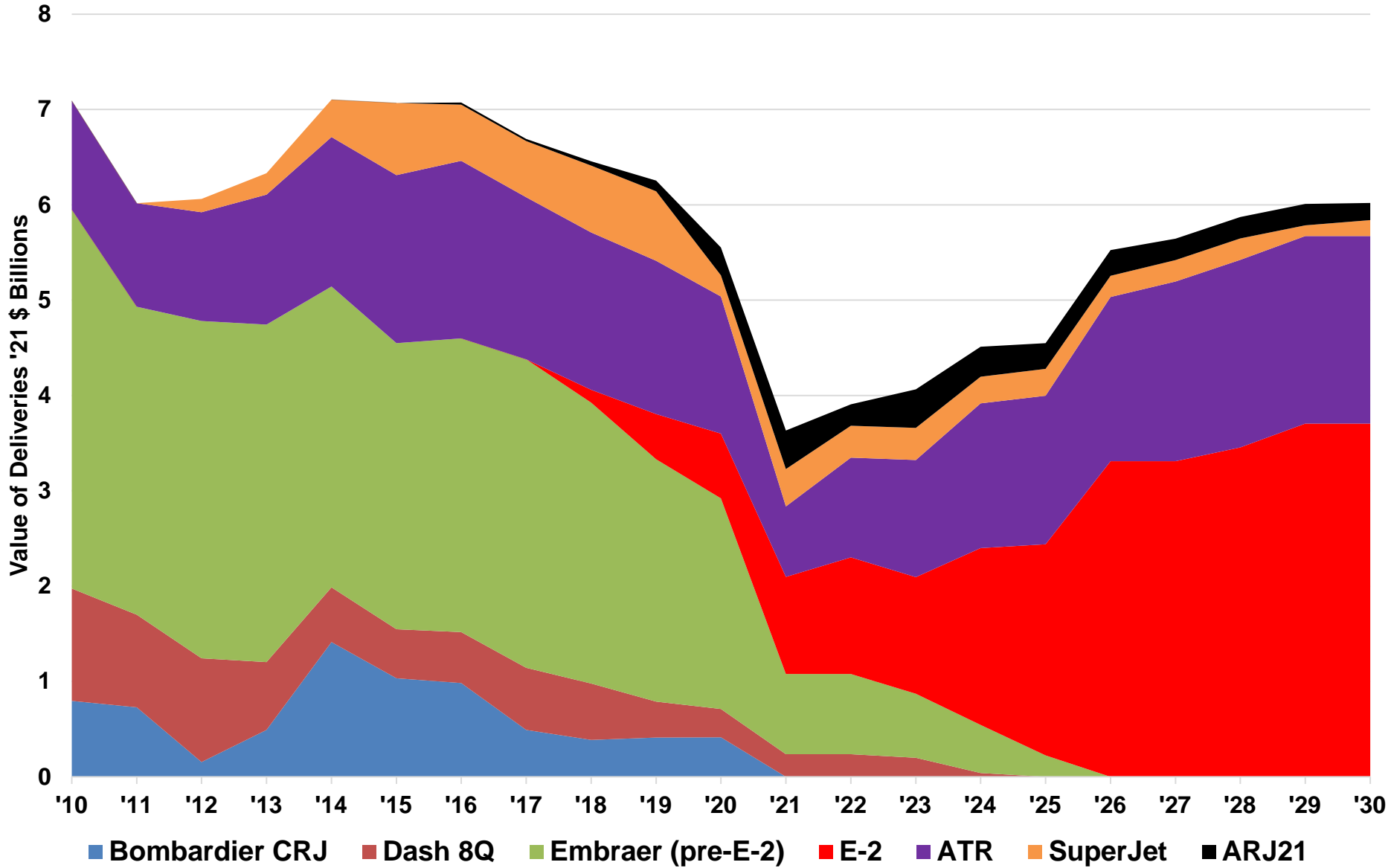


Realized Prices Versus Production Costs

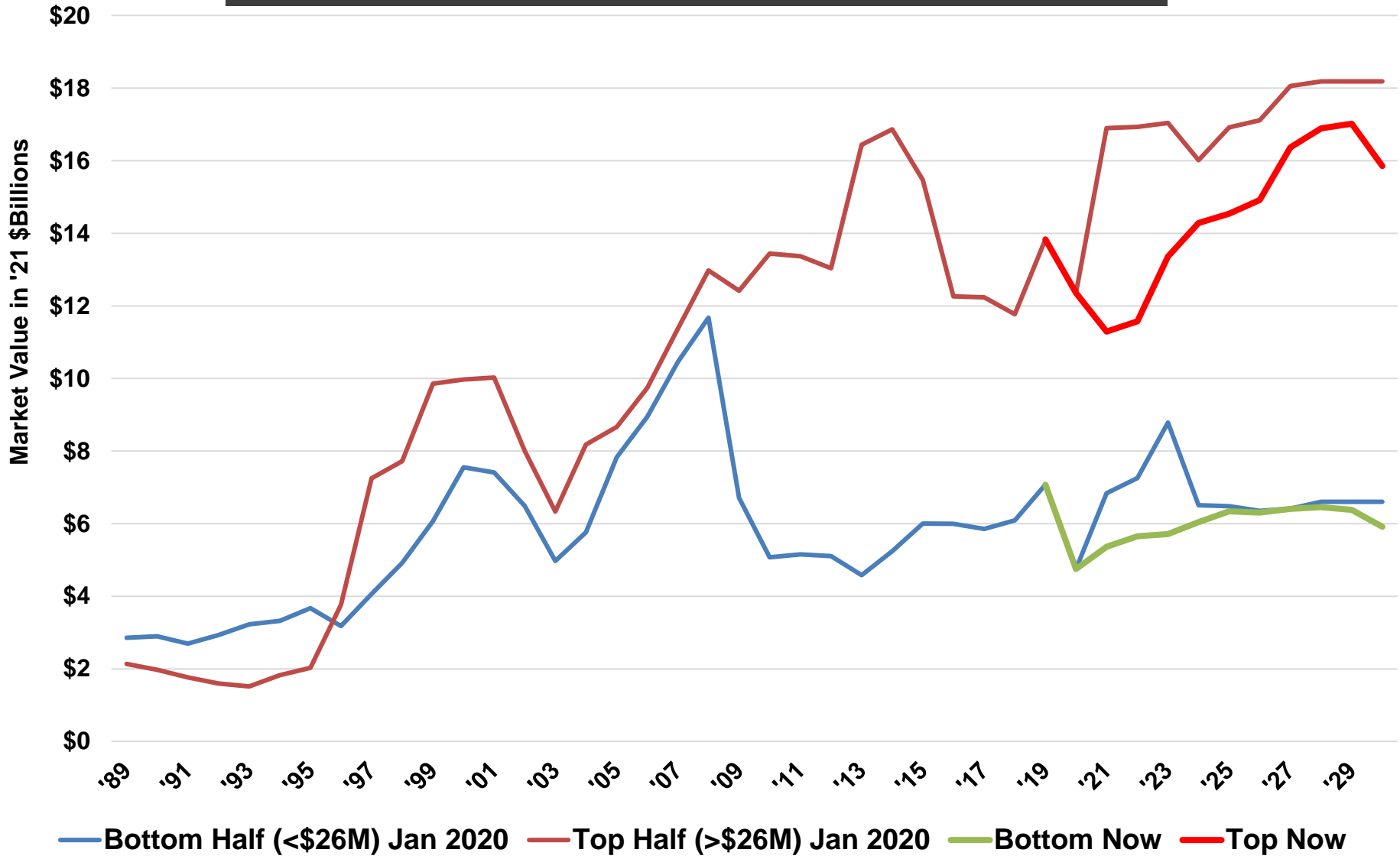
PPI For Aircraft Manufacturing per FRED; Prices Per Airline Monitor



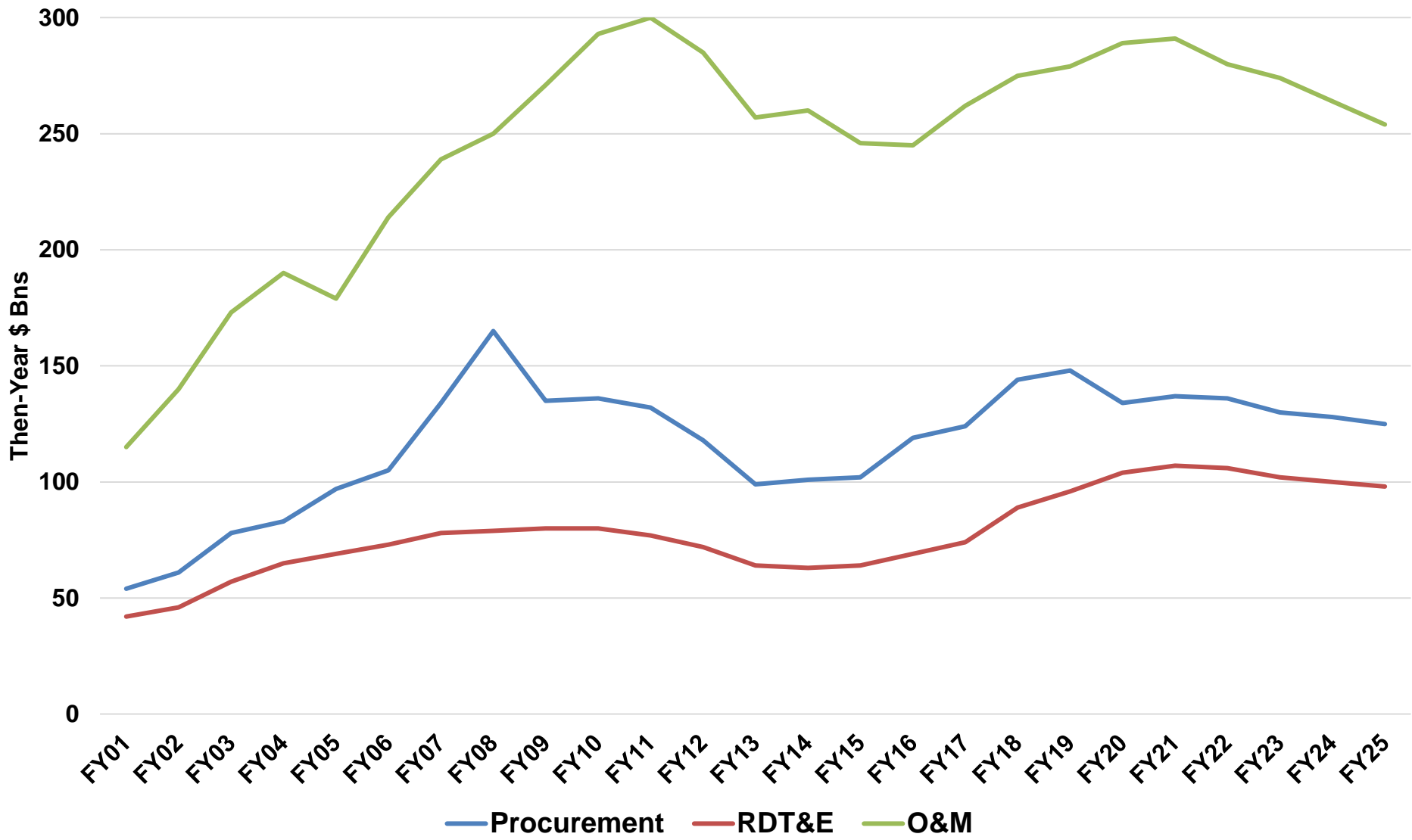
Regional Deliveries By OEM (Value)



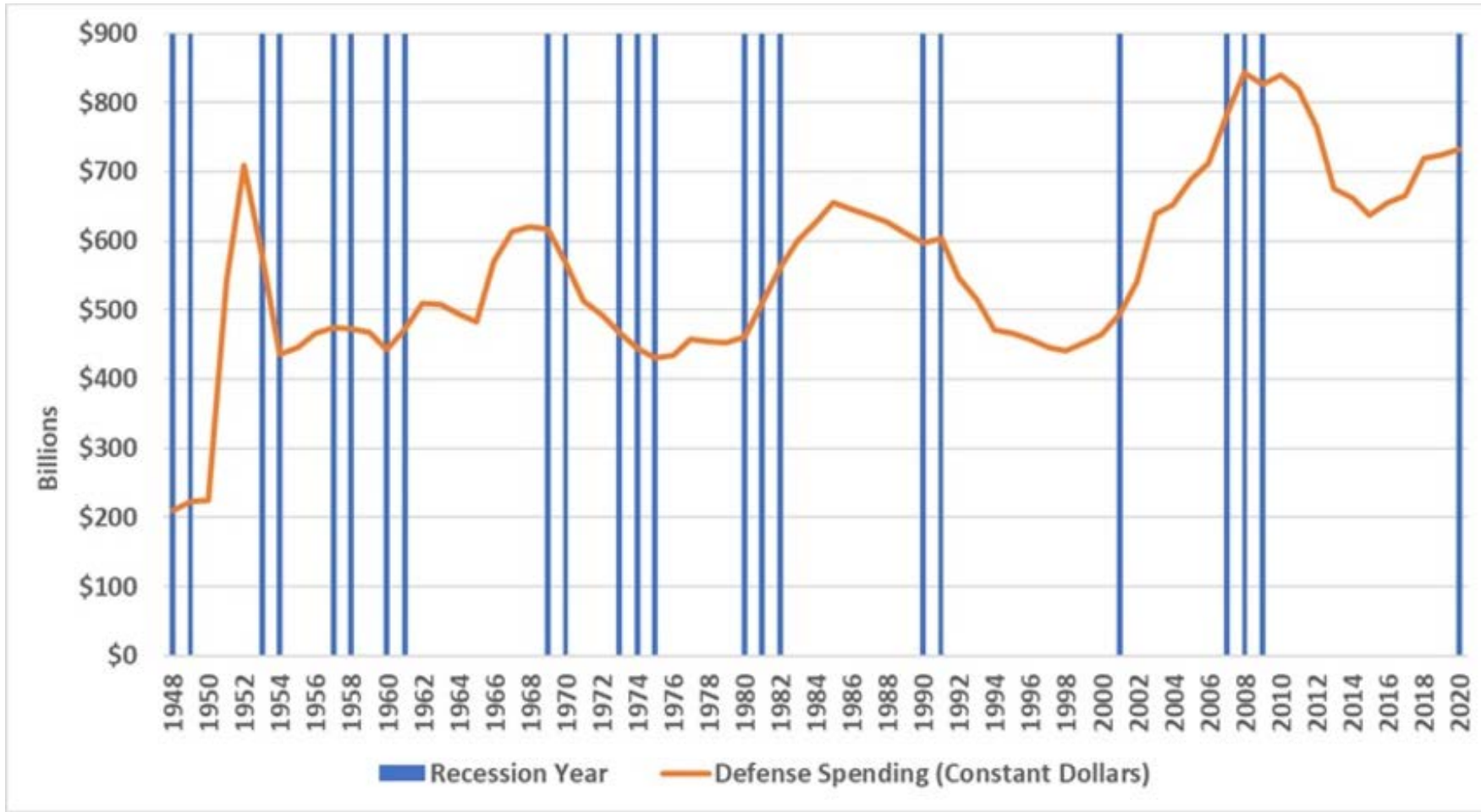
Bottom Half Bizjet Segment vs. Top Half Pre- and Post-Covid Forecasts



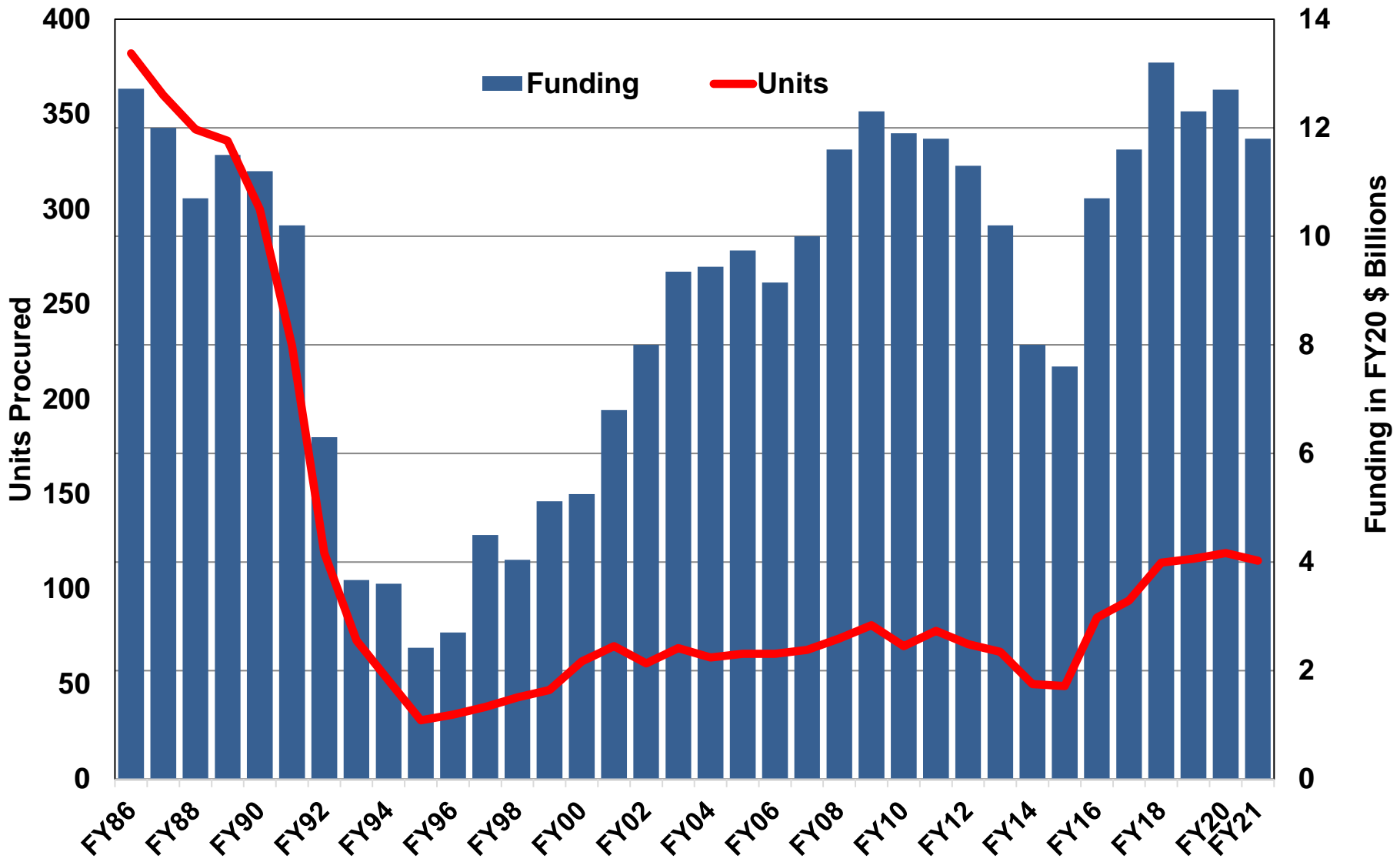
DoD Investment: Much Better Than In The Last Jetliner Downturn



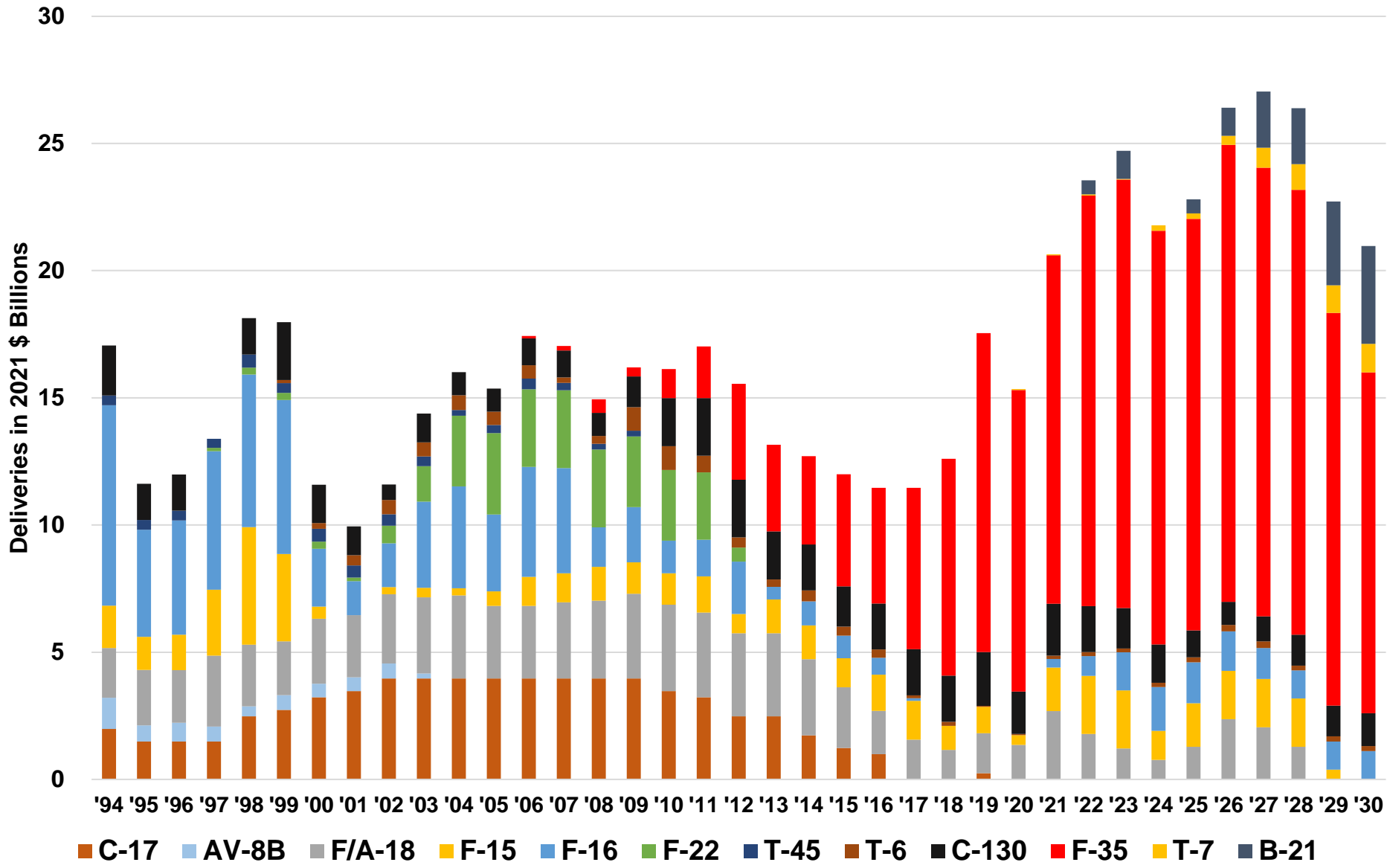
No Clear Relationship Between US Defense Spending, Economy



DoD Tactical Aircraft Procurement

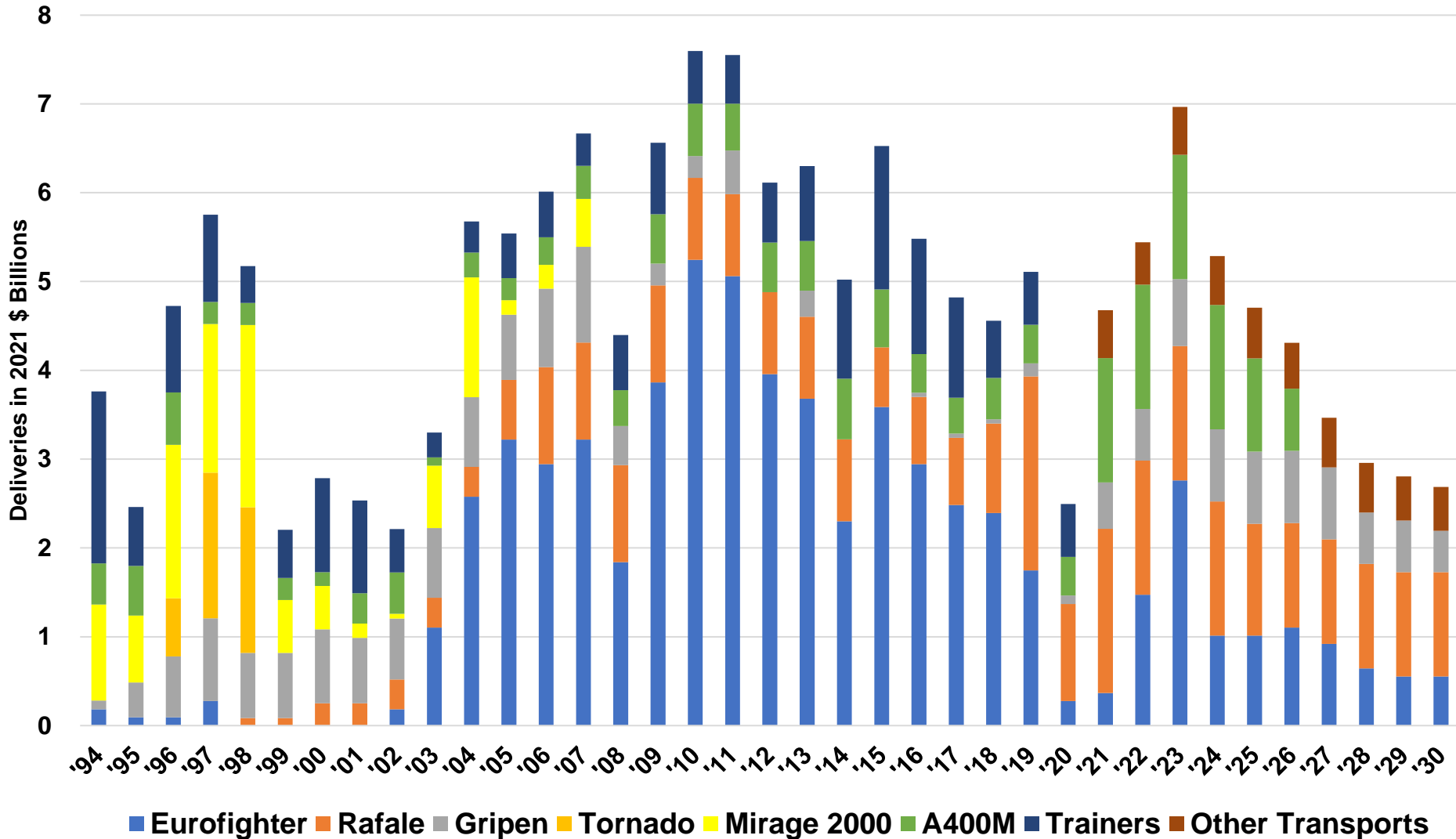


US Military Fixed Wing Aircraft Deliveries

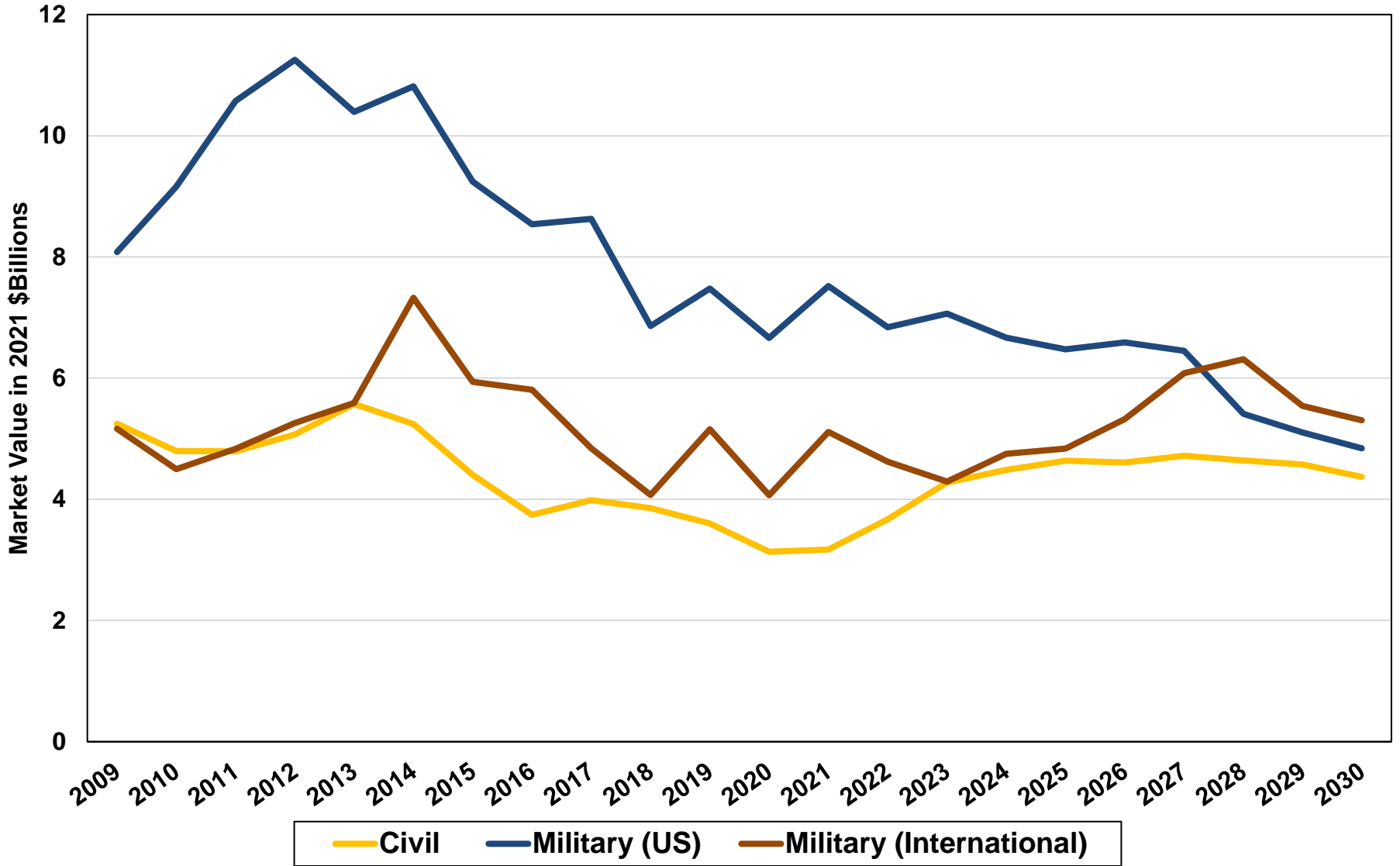


European Military Aircraft Deliveries

Coping Without F-35...To A Point;
Germany, France, UK Fighter Decisions Loom

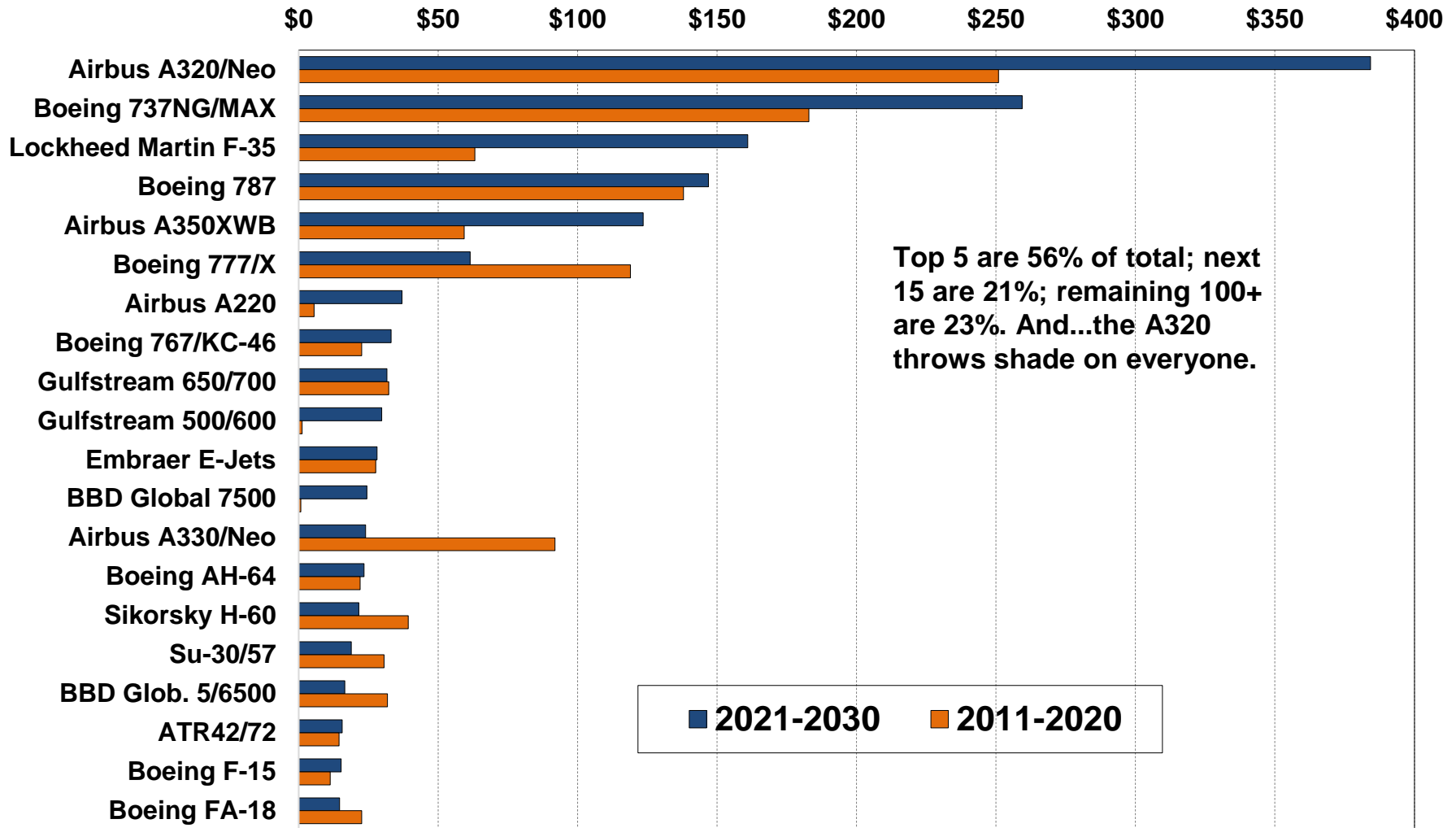


US Military Rotorcraft Market Falling; International Military and Civil Stable



Top 20 Aviation Programs; Volume Matters

Cumulative Deliveries Value in '21 \$ Bns



Global Aircraft Market Outlook In One Page

(Deliveries, *not* Production)

<u>Segment</u>	<u>2021</u>	<u>'21-'22</u>	<u>Risk</u>	<u>Elevator Comment</u>
Jetliners-SA	67.5%	10.0%		Includes some already-built MAXs. Watch China, fuel, traffic.
Jetliners-TA	12.2%	-18.5%		Overcapacity, slow international recovery, secular shift to SAs; 787 inventory issue
Regionals	24.1%	5.6%		No Boeing supply chain effect on E-2; Scope clause de-risked, but little growth.
Business Aircraft	-3.0%	6.8%		Another hit after many false starts over a disappointing decade.
Civil Rotorcraft	0.0%	15.0%		Large civil hit again. Too many new models aimed at a weak segment (oil/gas).
Military Rotorcraft	19.2%	-9.3%		Programs end/slow; no risk of accelerated downturn; FVL beyond forecast, exc FARA.
Military Transports	4.8%	-4.8%		A seriously underperforming market.
Fighters	29.2%	18.6%		I like this market. F-35 (after COVID disruption), plus strong Gen 4.5
<u>All Civil</u>	<u>27.1%</u>	<u>0.7%</u>		SAJetliner snapback due to MAX, weakness in other segments; more overcapacity risk.
<u>All Military</u>	<u>20.3%</u>	<u>8.7%</u>		Global insecurity, Tension, Malice. Special mission (ISR, B-21) also boosts topline.
<u>Total Industry</u>	<u>25.0%</u>	<u>3.1%</u>		<u>Back to peak in late 2024</u>

World Aircraft Deliveries By Value, 1989-2030

