

The Great Jetliner Hope

Issues In Civil Aviation Competitiveness

Presentation to National Academies Aeronautics Research and Technology Roundtable

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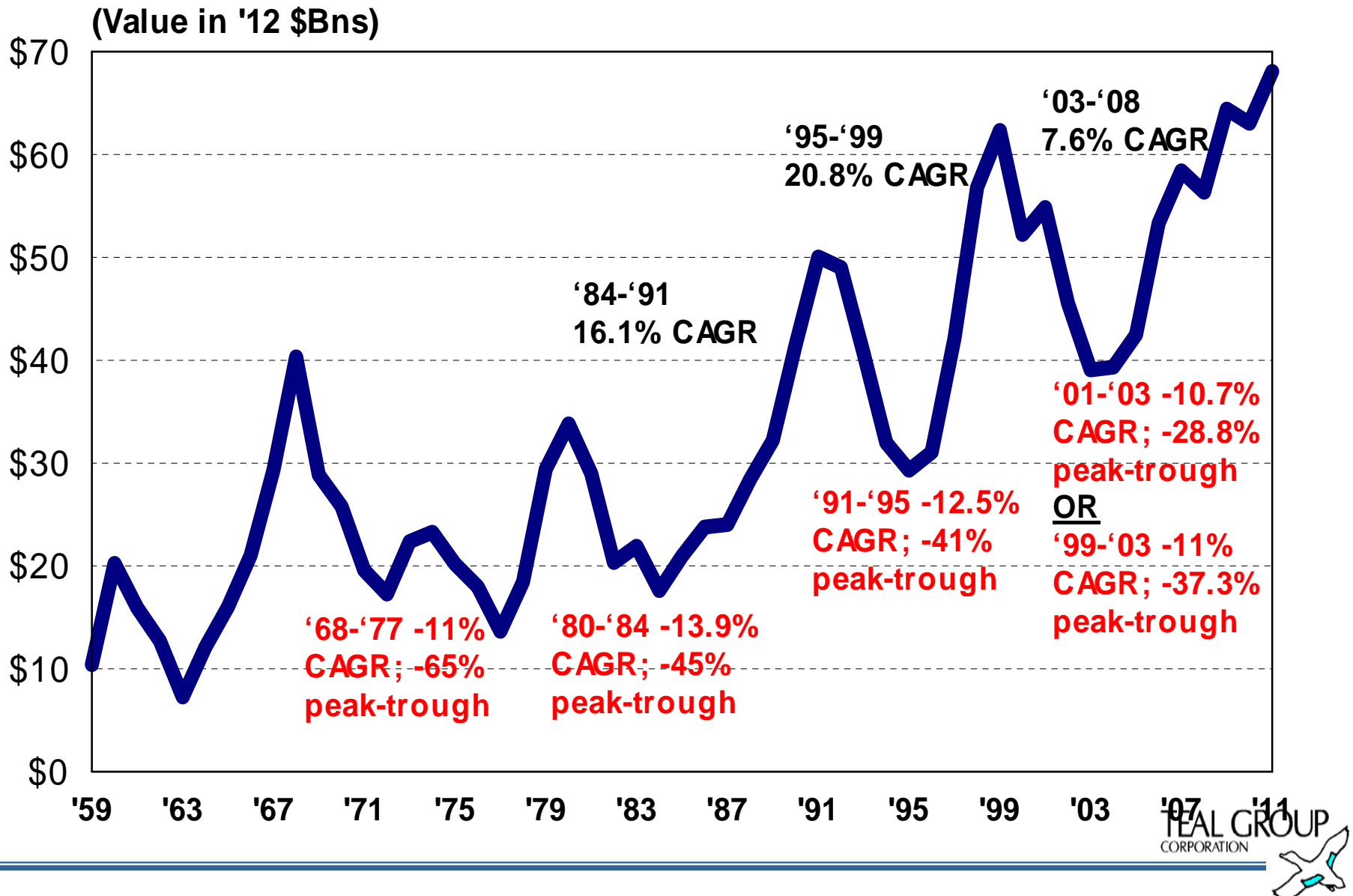


Aircraft Markets, Through Good And Bad Years

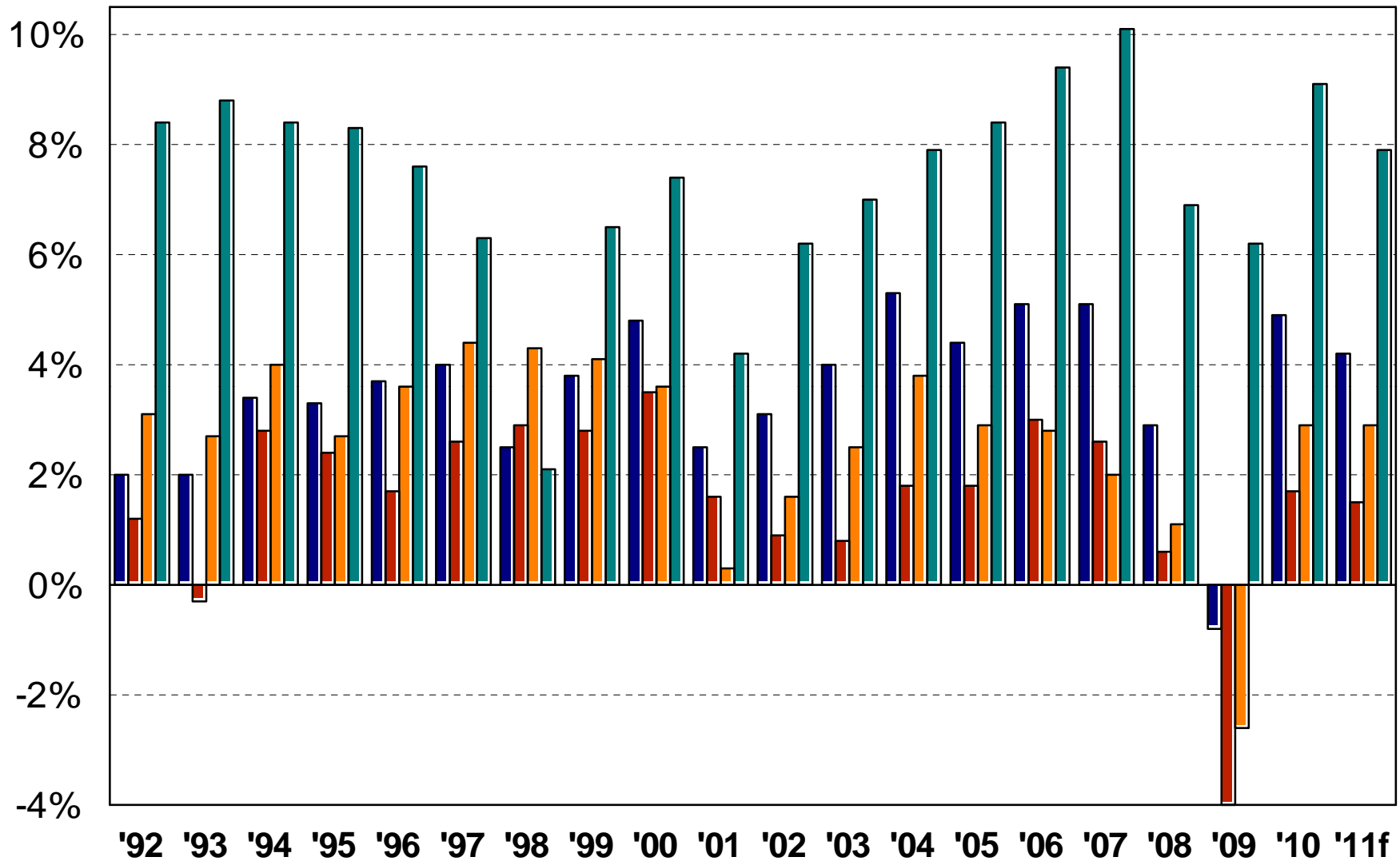
<u>Worldwide Deliveries By 2012 \$ Value</u>	<u>CAGR '03-'08</u>	<u>CAGR '08-'11</u>	<u>Change '08-'11</u>	<u>Change '10-'11</u>
Large Jetliners	7.6%	6.5%	20.8%	8.0%
Business Aircraft	17.5%	-13.7%	-35.8%	-10.7%
Regionals	4.1%	-10.1%	-27.3%	-2.0%
Civil Rotorcraft	17.1%	-7.6%	-21.2%	3.8%
Military Rotorcraft	8.7%	13.5%	46.2%	12.6%
Fighters	1.5%	7.4%	23.9%	4.5%
All Civil	9.8%	-0.2%	-0.7%	3.7%
Total	8.1%	1.7%	5.2%	3.8%

Our Forgotten Nemesis...Cyclicality

Large Jetliner Deliveries By Value



GDP Year/Year Growth Rates

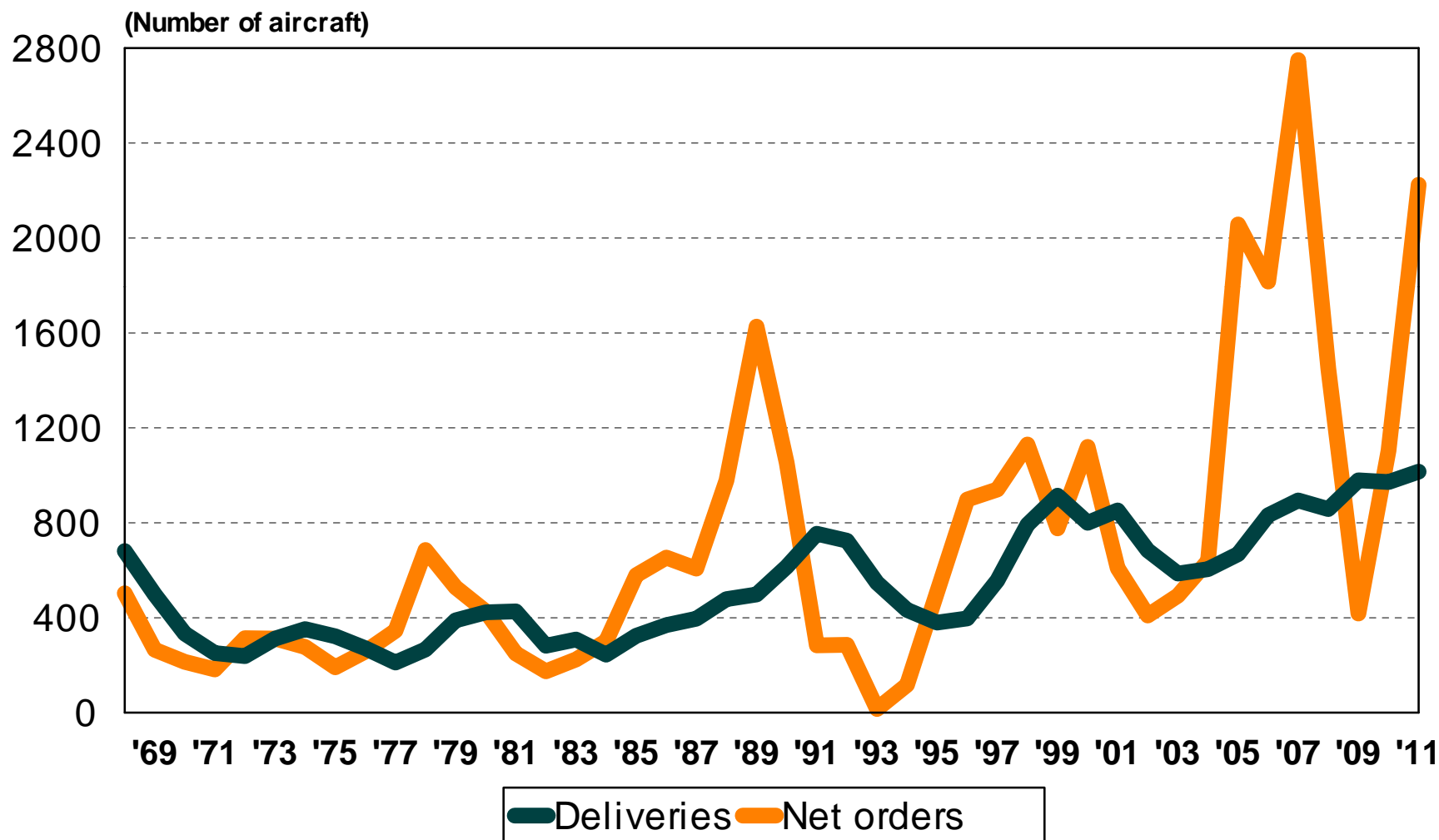


World EU US Asia Ex-Japan

Source: Morgan Stanley

Historical Jetliner Orders And Deliveries

**Four Great Book-To-Bill Years, Followed By A Cliff Dive;
Good Recovery, But Driven By Long-Term Orders**



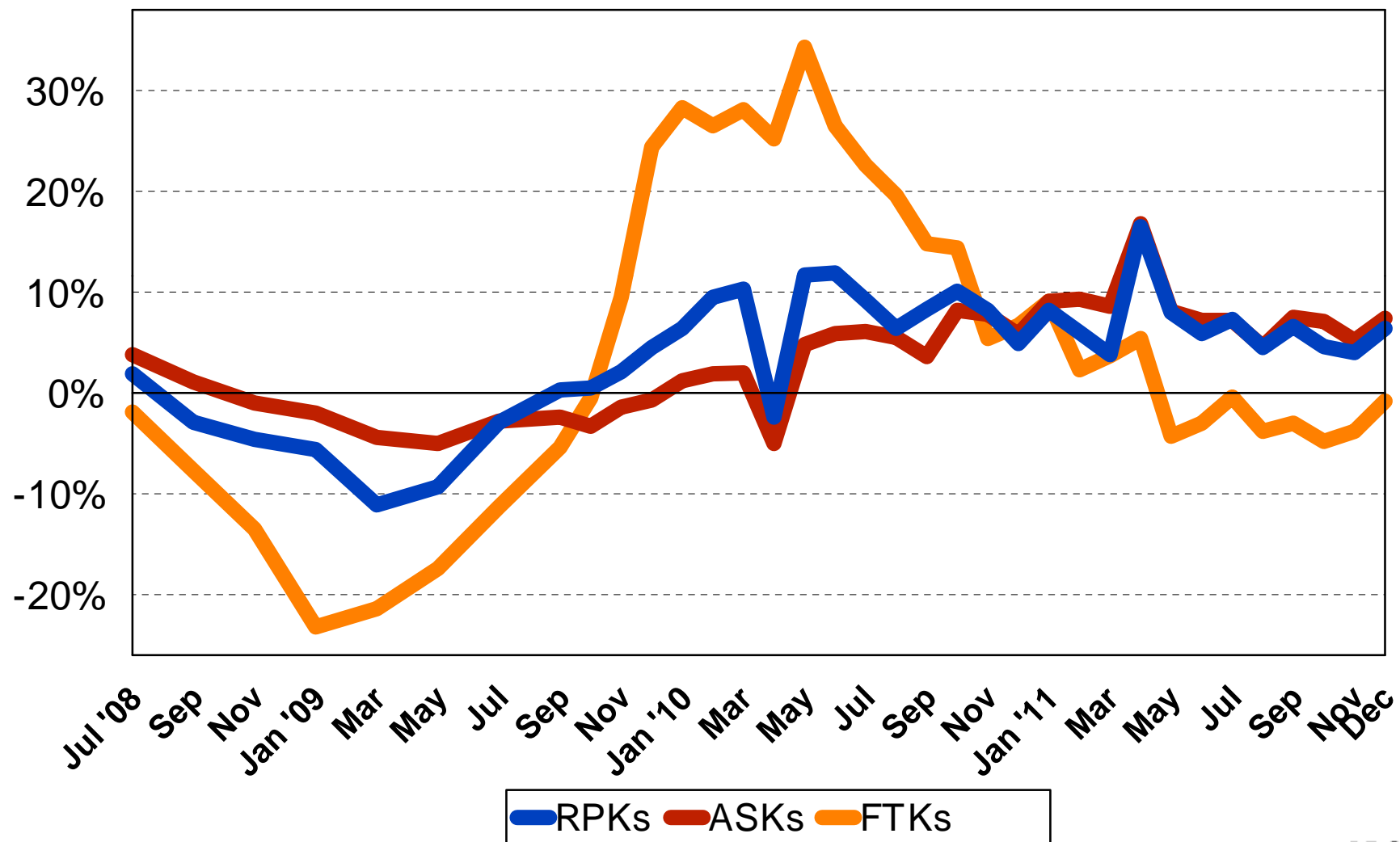
All Airbus and Boeing aircraft

What's Different With This “Cycle”

- **High fuel prices.**
- **Stronger emerging markets.**
- **Government export credit finance.**
 - From 15% to ~35%.
- **Other government support (sovereign funds, government banks and airlines).**
- **Global flight to safe assets (“excessive demand”?).**
- **Need to forestall emerging competition?**
- **The primes really need cash.**
 - With declining defense, everyone needs a growth story.

Y/Y Traffic: Nice Recovery; Cargo A Concern

2011 Totals: RPKs 6.9%, ASKs 8.2%, FTKs -0.6%

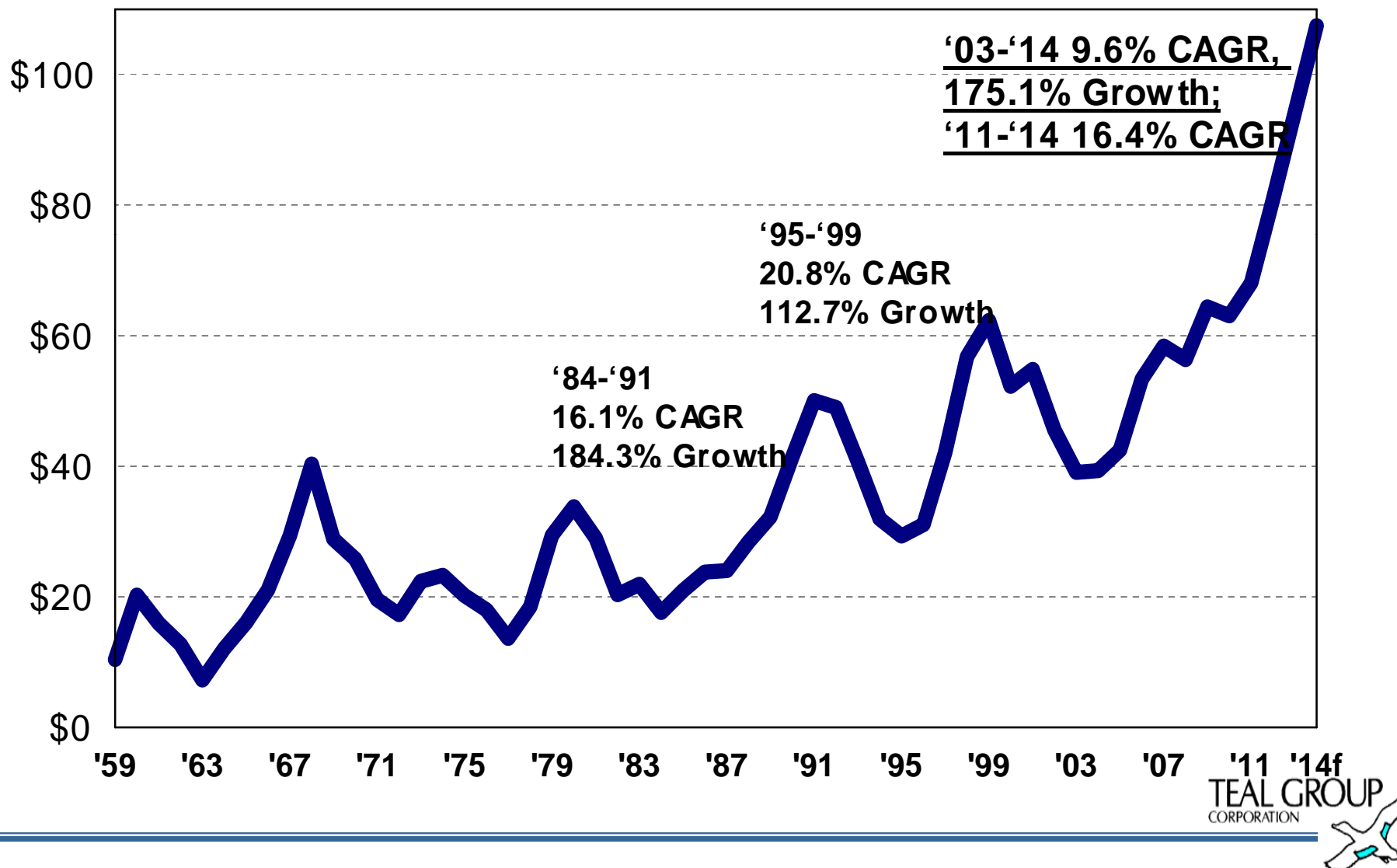


Source: IATA

Do You Believe In Super Cycles?

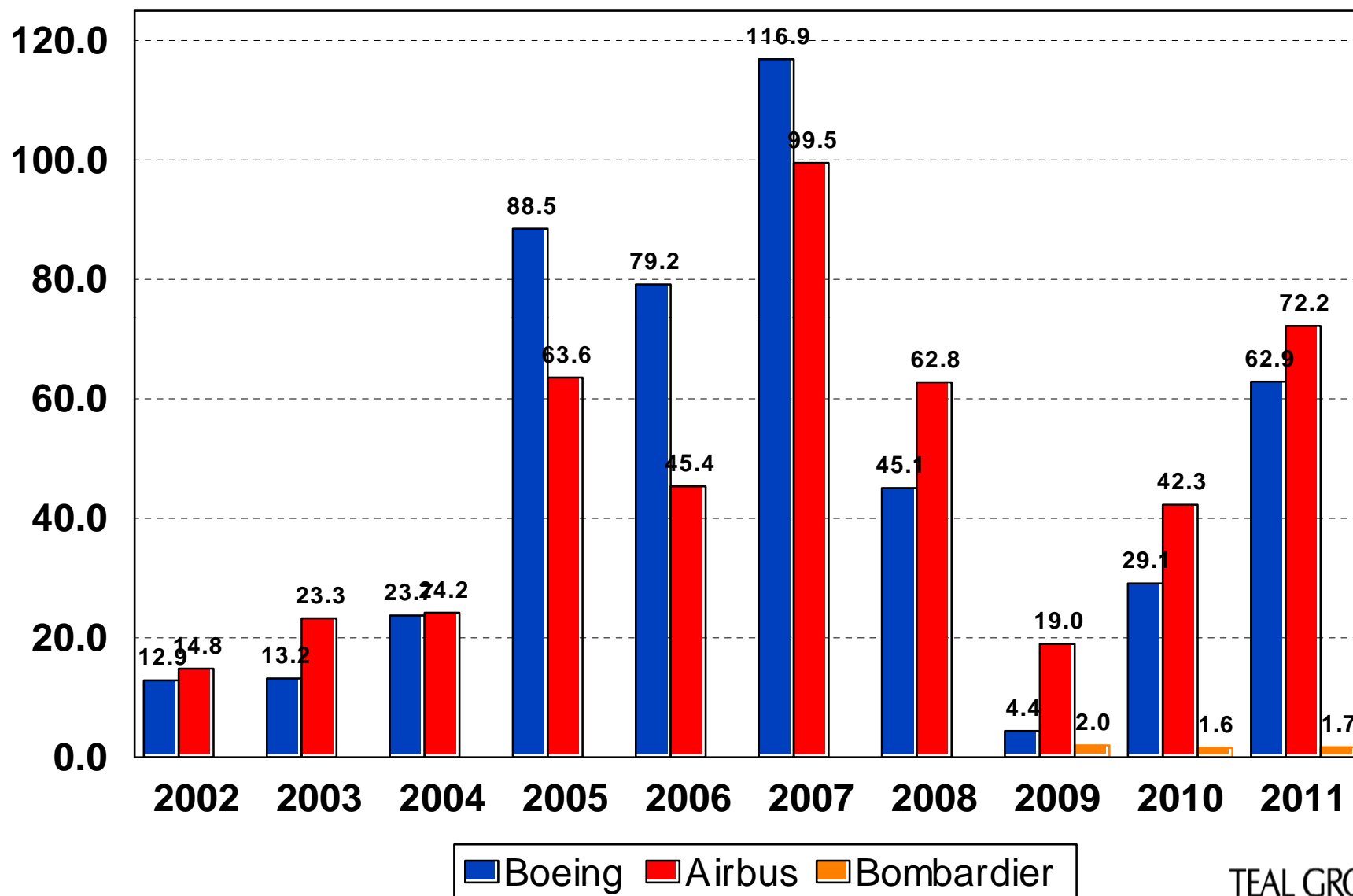
History And OEM Plans For Large Jet Transport Deliveries By Value

(Value in '12 \$ Bns)

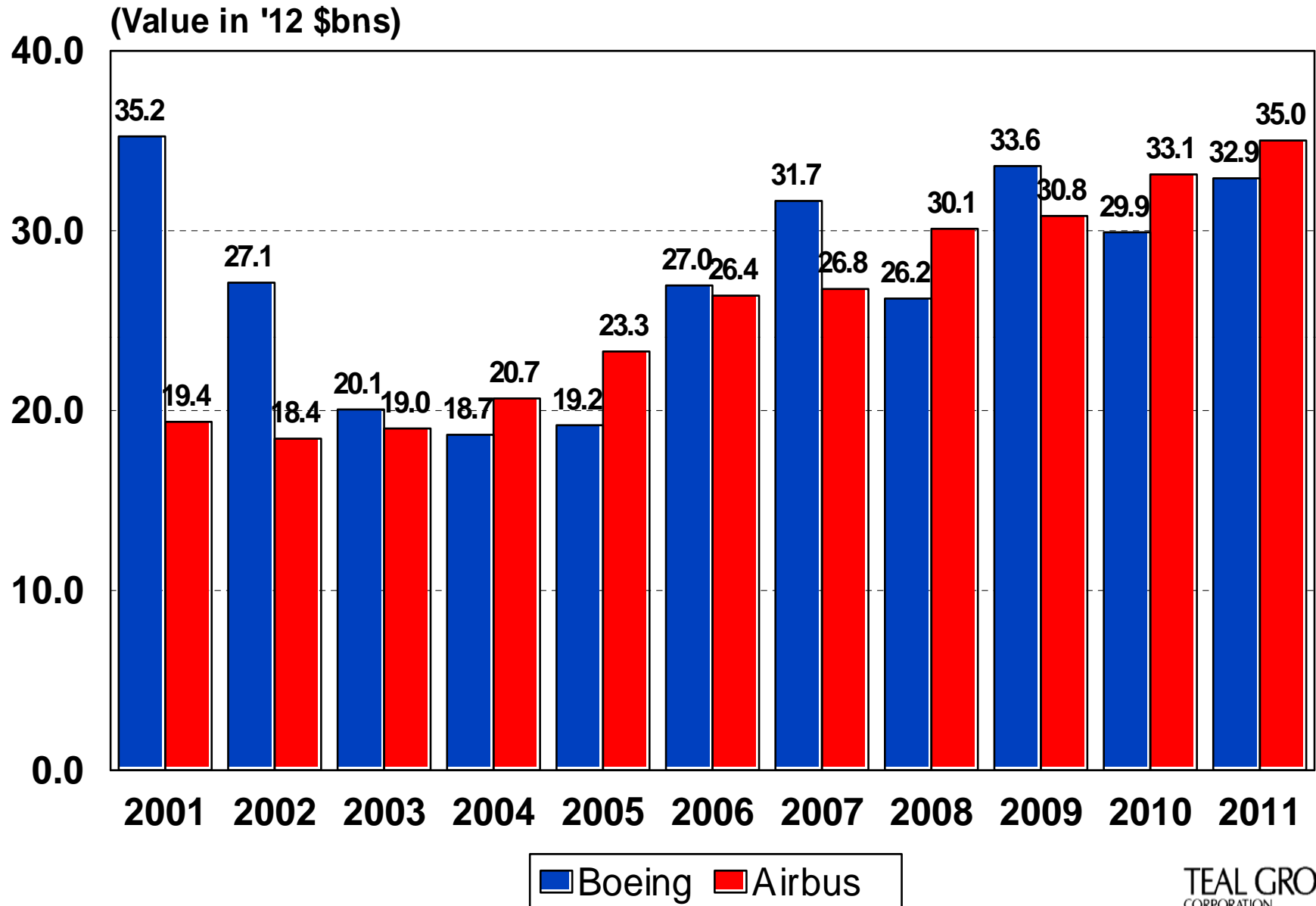


Comparative Order Values

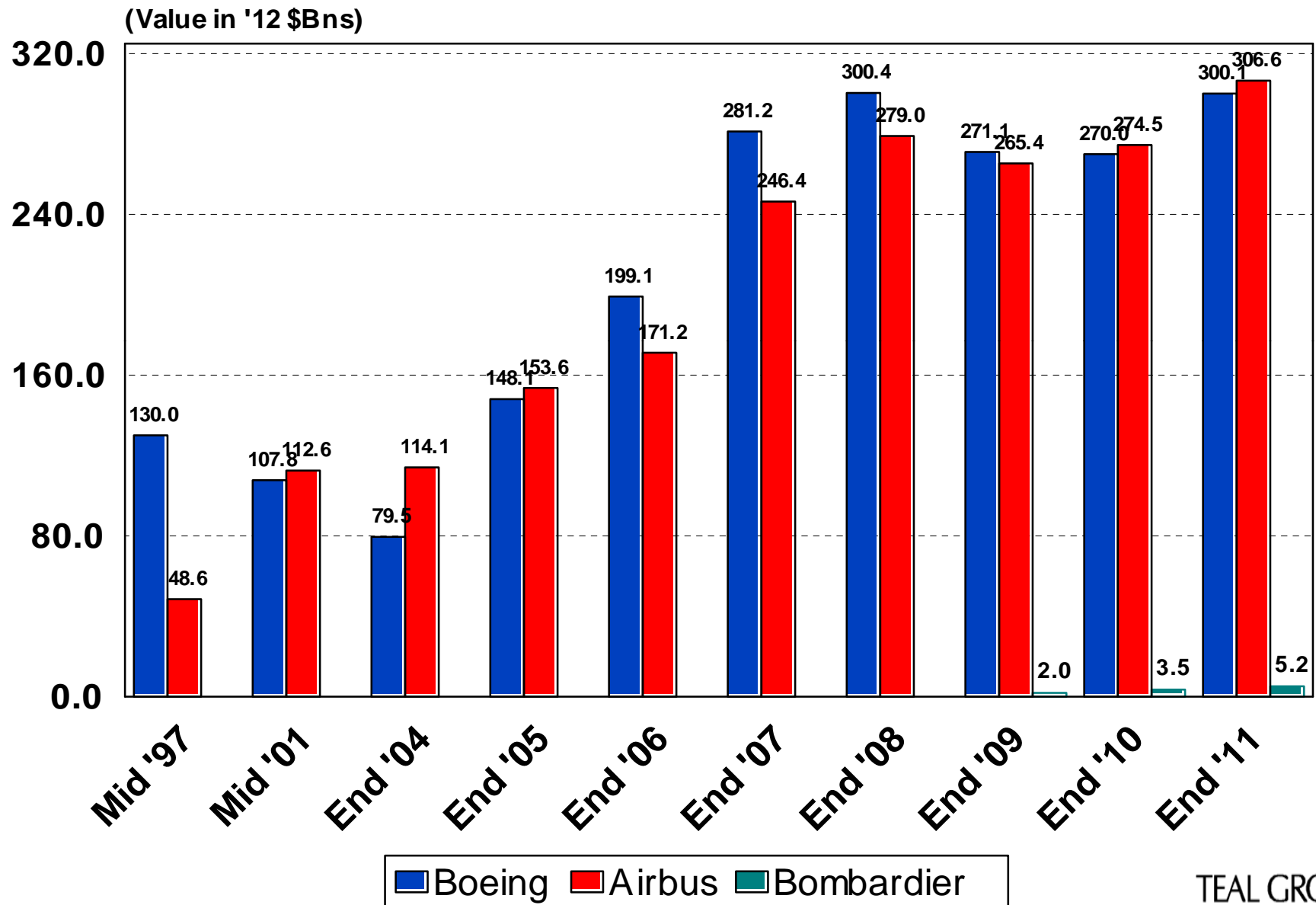
(Value in '12 \$bns)



Comparative Delivery Values

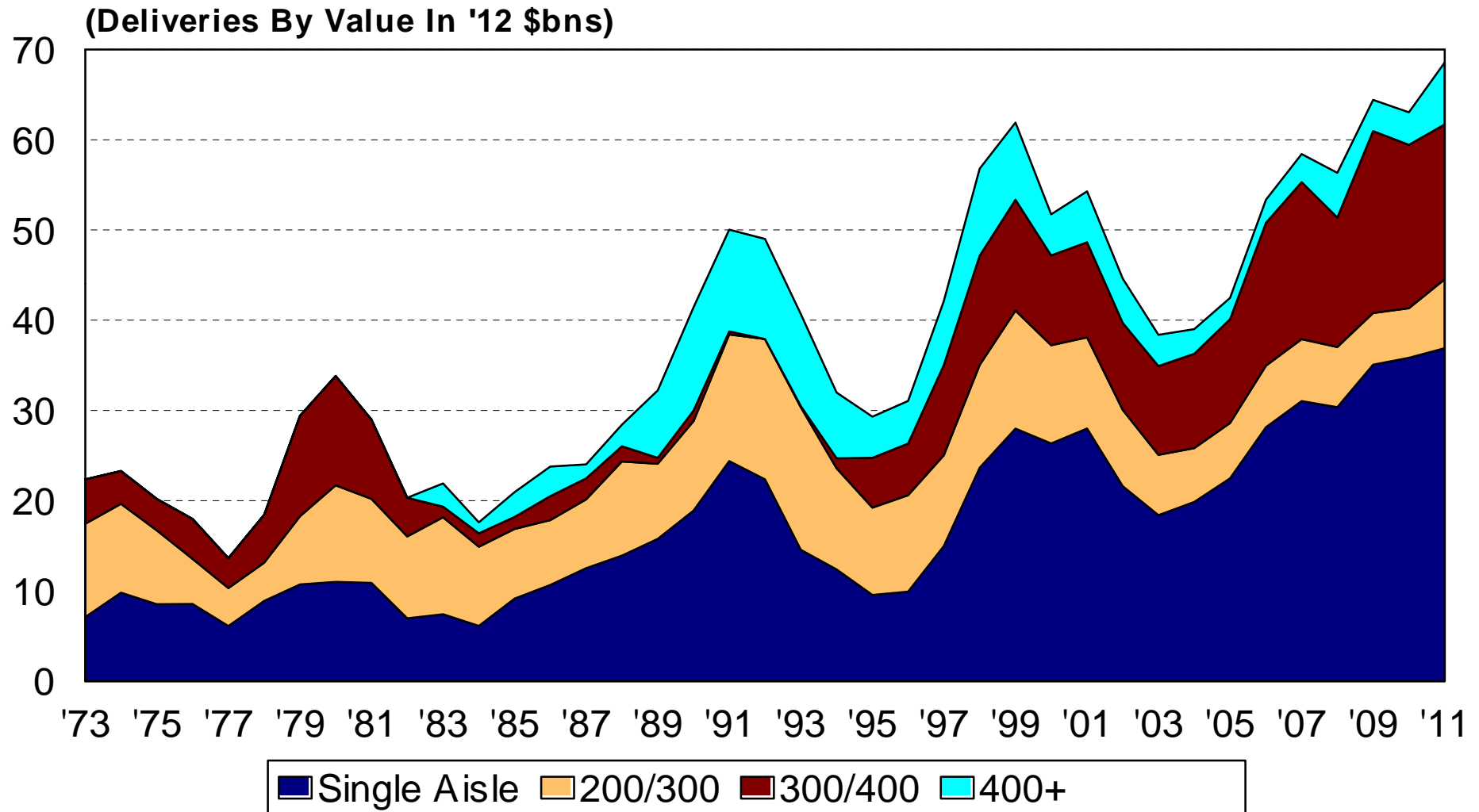


Comparative Backlog Values



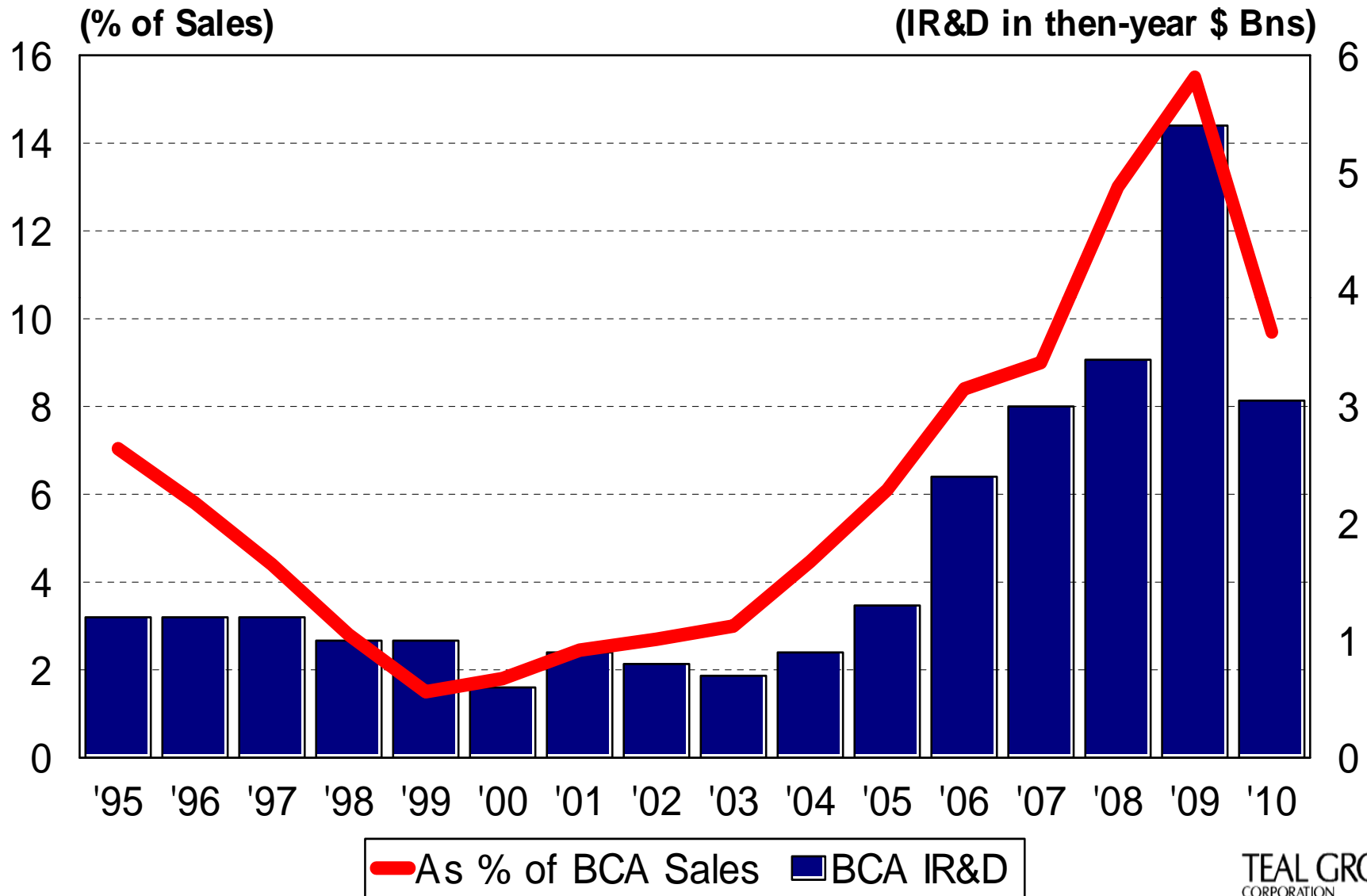
Jetliner Segment Deliveries

Single Aisles--Two Families--Were 54% Of 2011 Deliveries, 53% Of 2002-2011 Deliveries

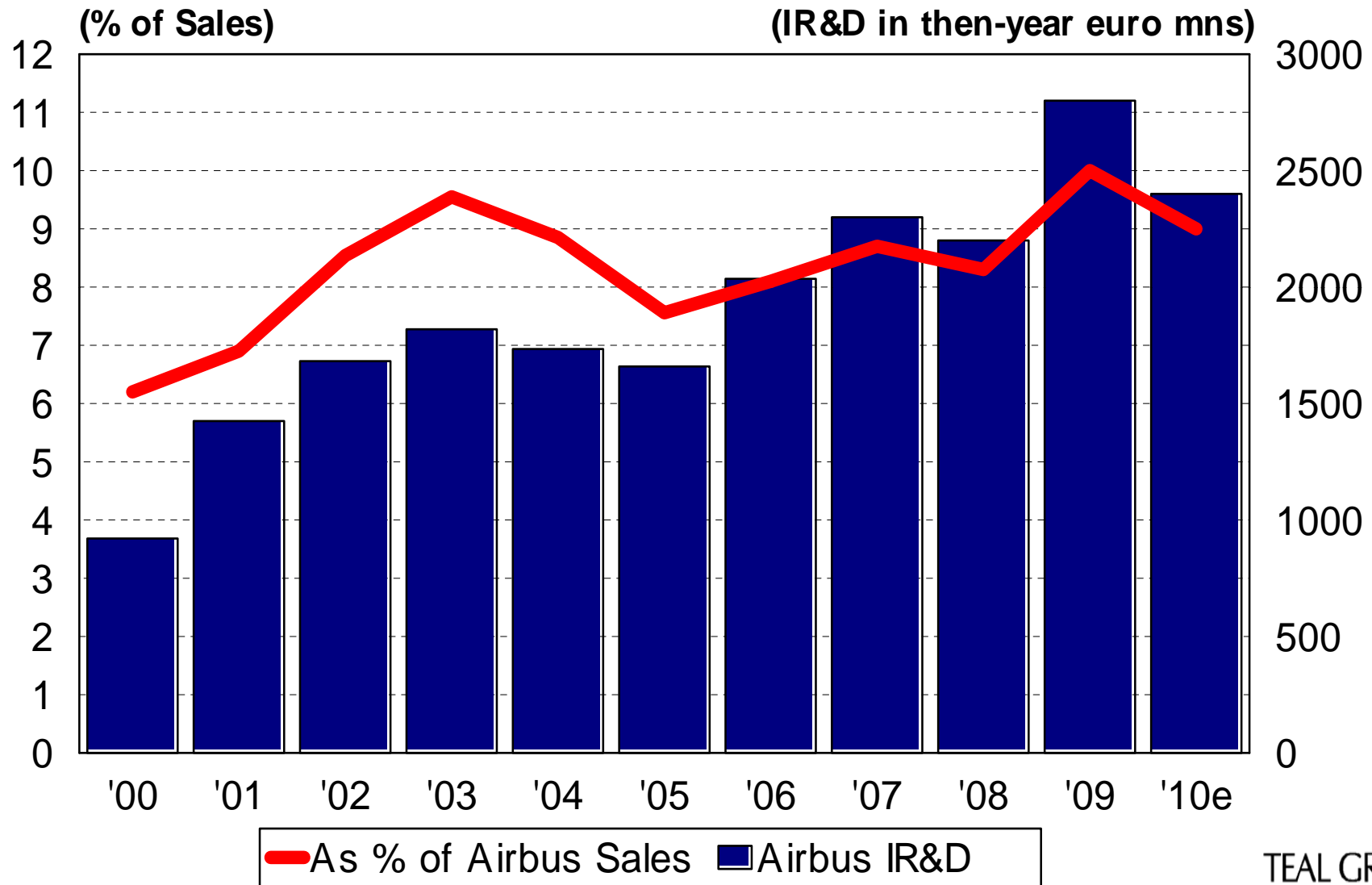


Mainline only

Boeing Commercial Aircraft IR&D: Hitting New Heights



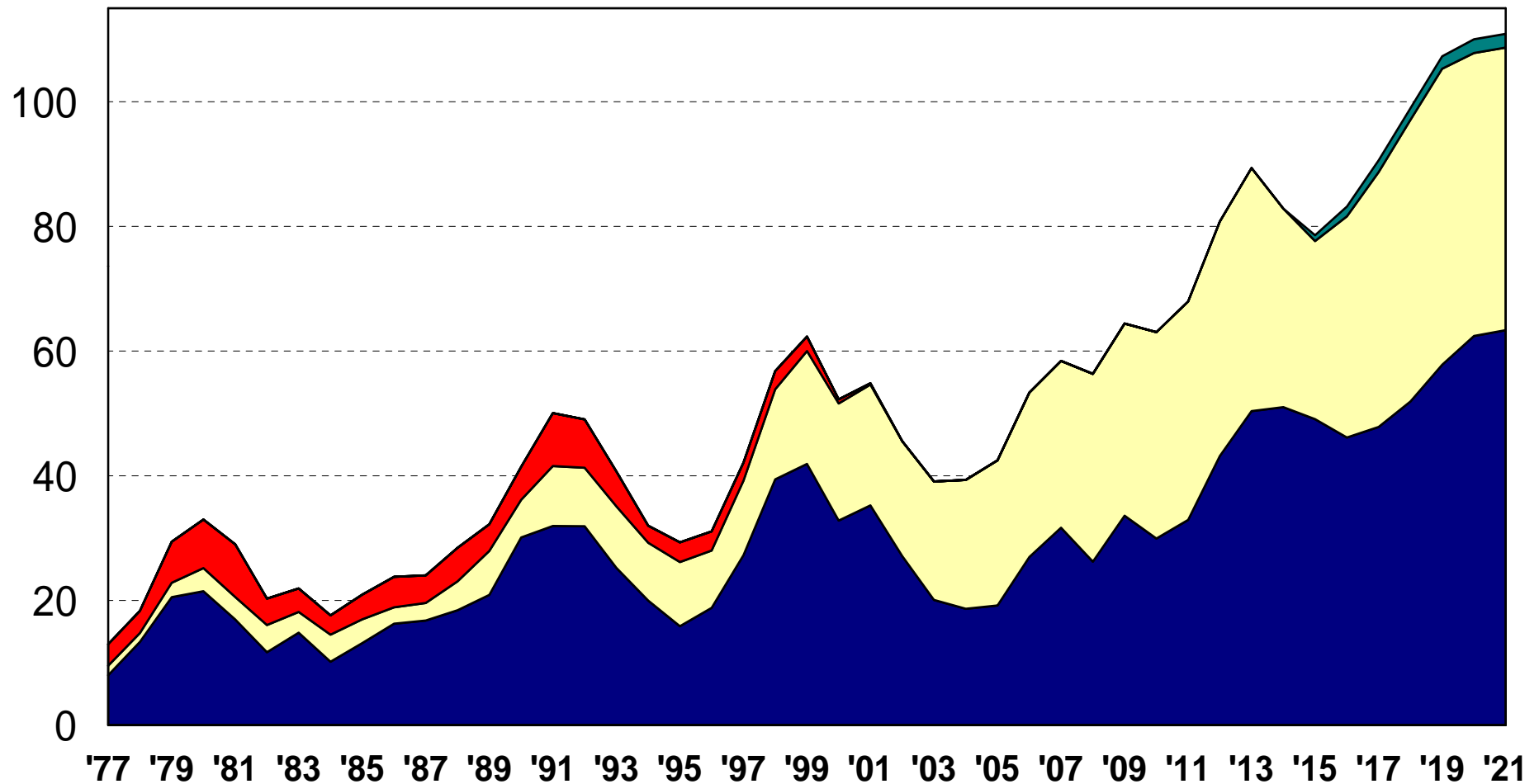
Airbus Commercial IR&D...Just Getting Started With A350XWB, A320neo



Market Share Outlook By Deliveries Value

Assumes A350 XWB EIS 2Q2015

(Value in '12 \$Bns)

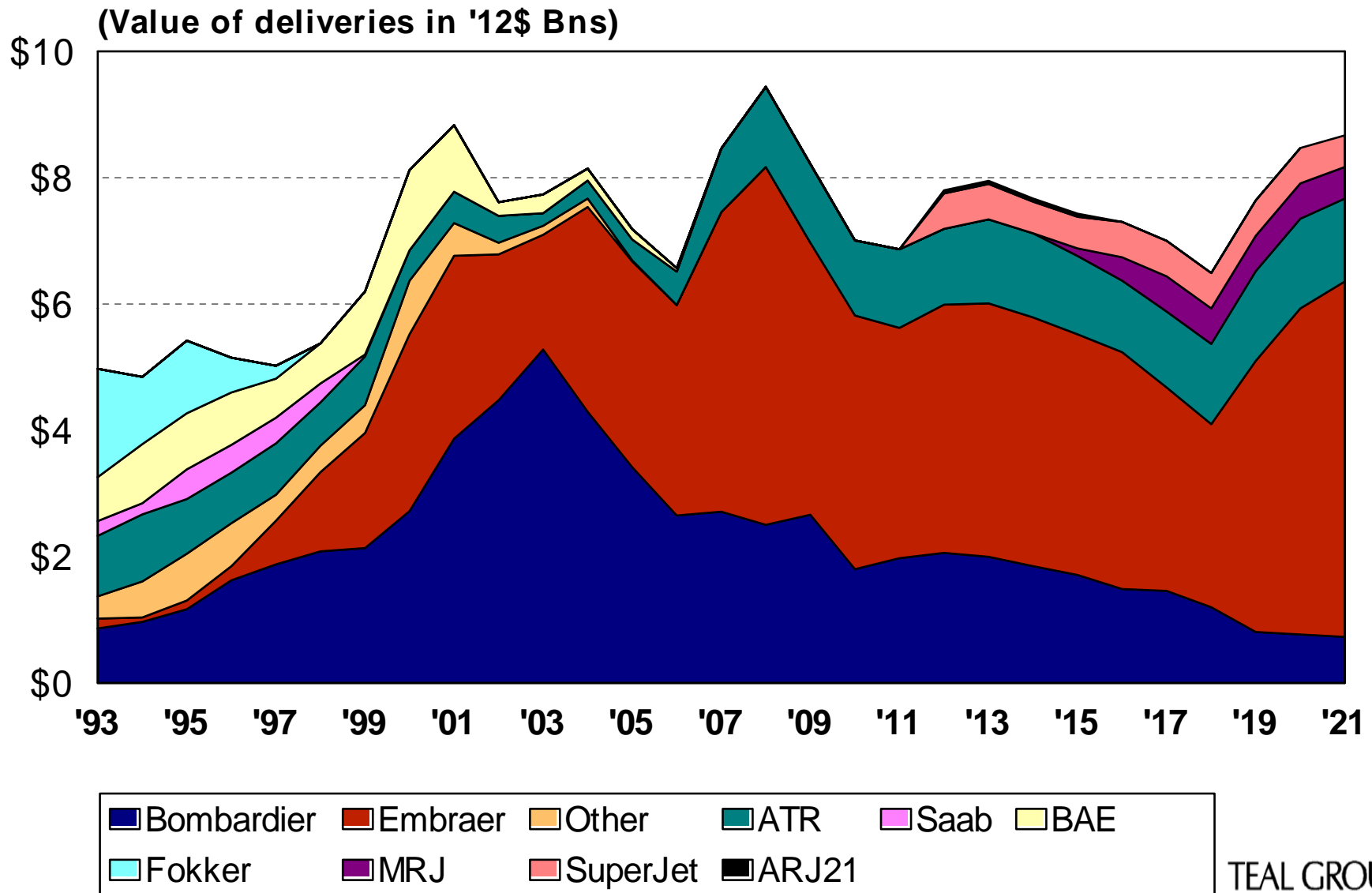


Boeing Airbus Douglas/Lockheed Bombardier/COMAC

US Jetliner Industrial Policy Today

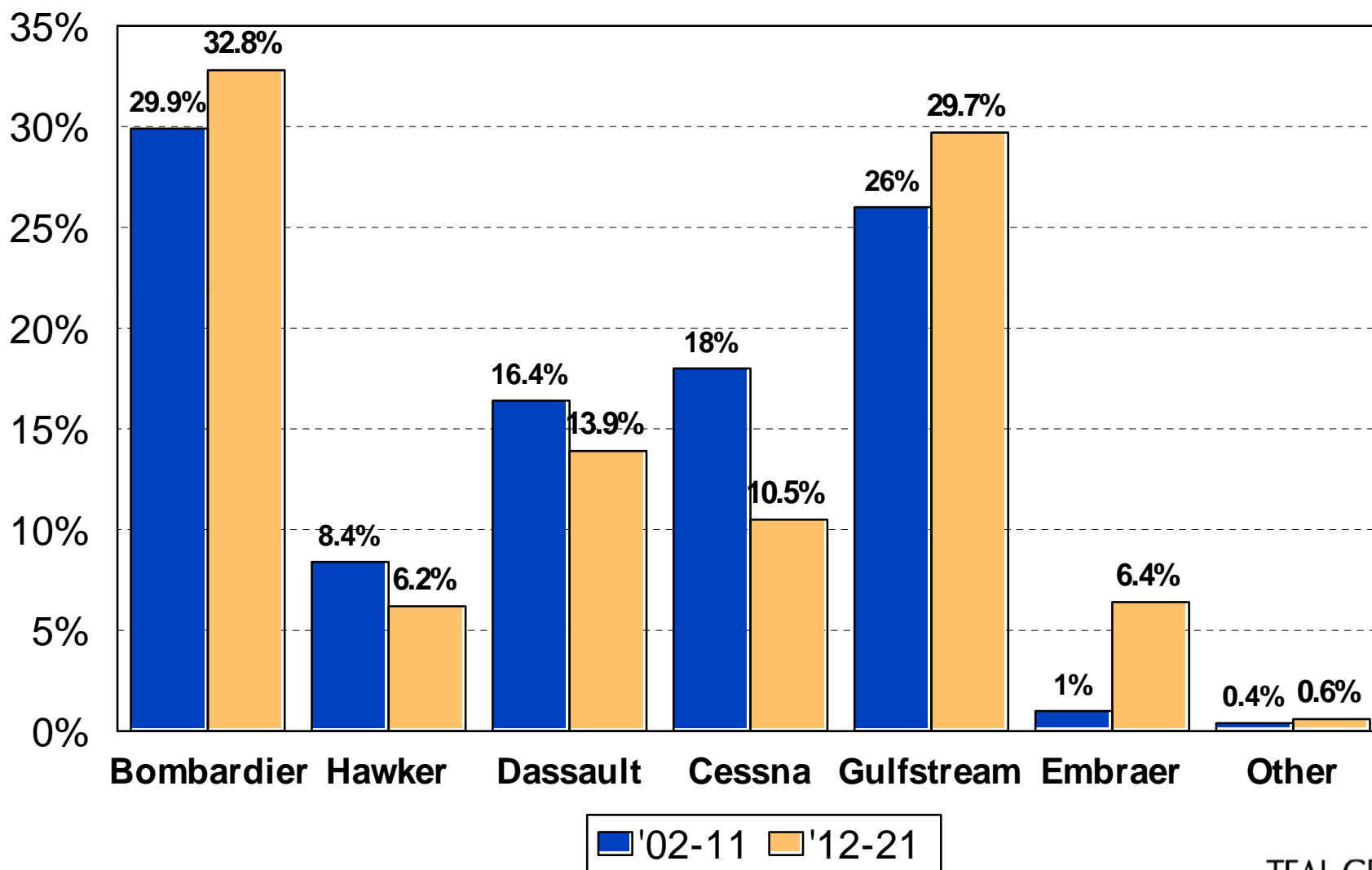
- **The former approach: no direct aid, but some cash for advanced, high-risk R&D.**
- **The new approach: lots of direct aid, less cash for advanced R&D.**
- **Manifestation: Ex-im bank jetliner transaction funding, now augmented by supplier aid program.**
 - **Transaction funding goal is level playing field. That's valid, but nobody seems to want to disarm.**

Regional Market Entrances Possible; Exits More Common



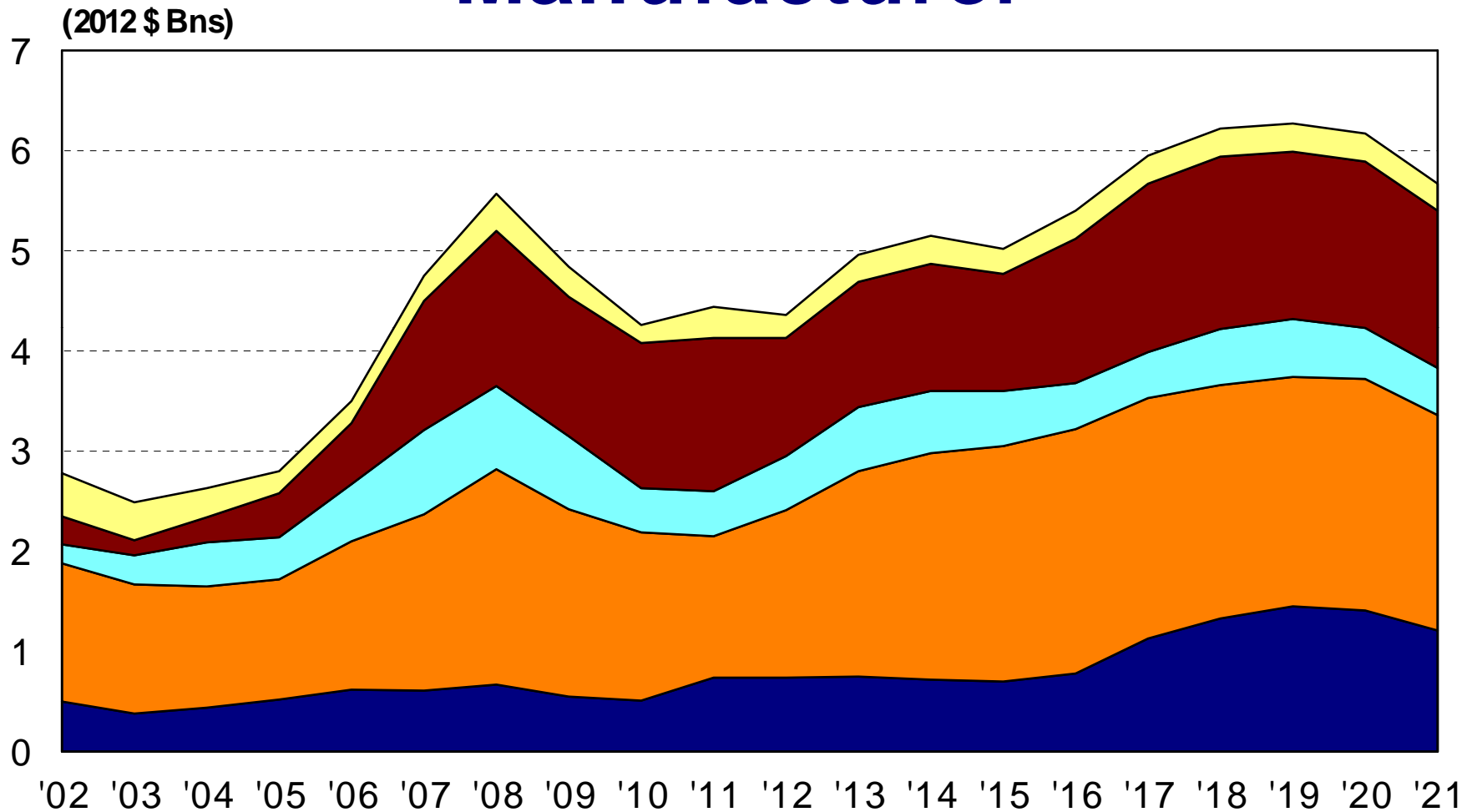
Business Jet Manufacturer Market Shares

By Deliveries Value, 2012-2021 Vs 2002-2011

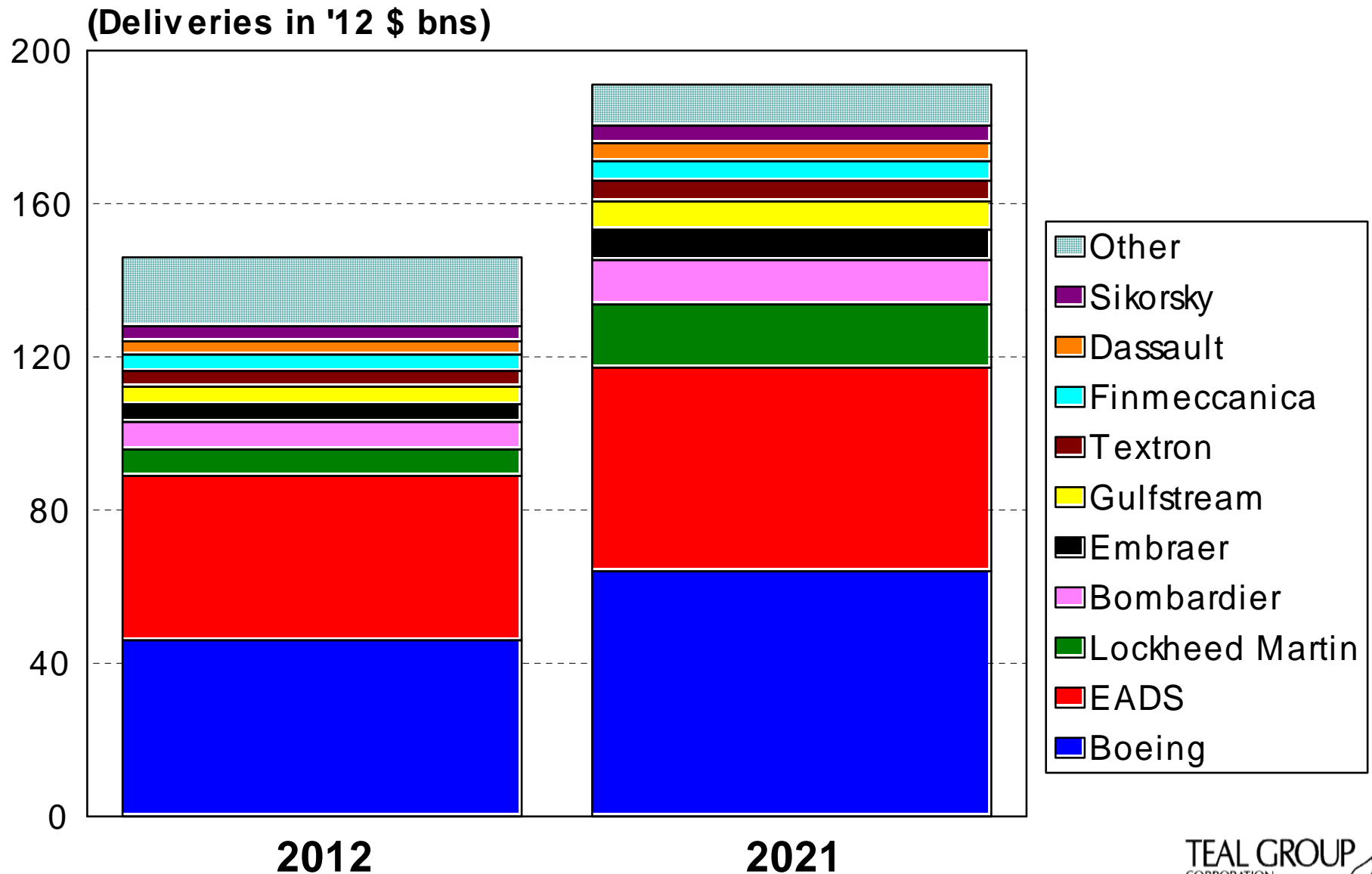


Excludes jetliners, RJs, turboprops

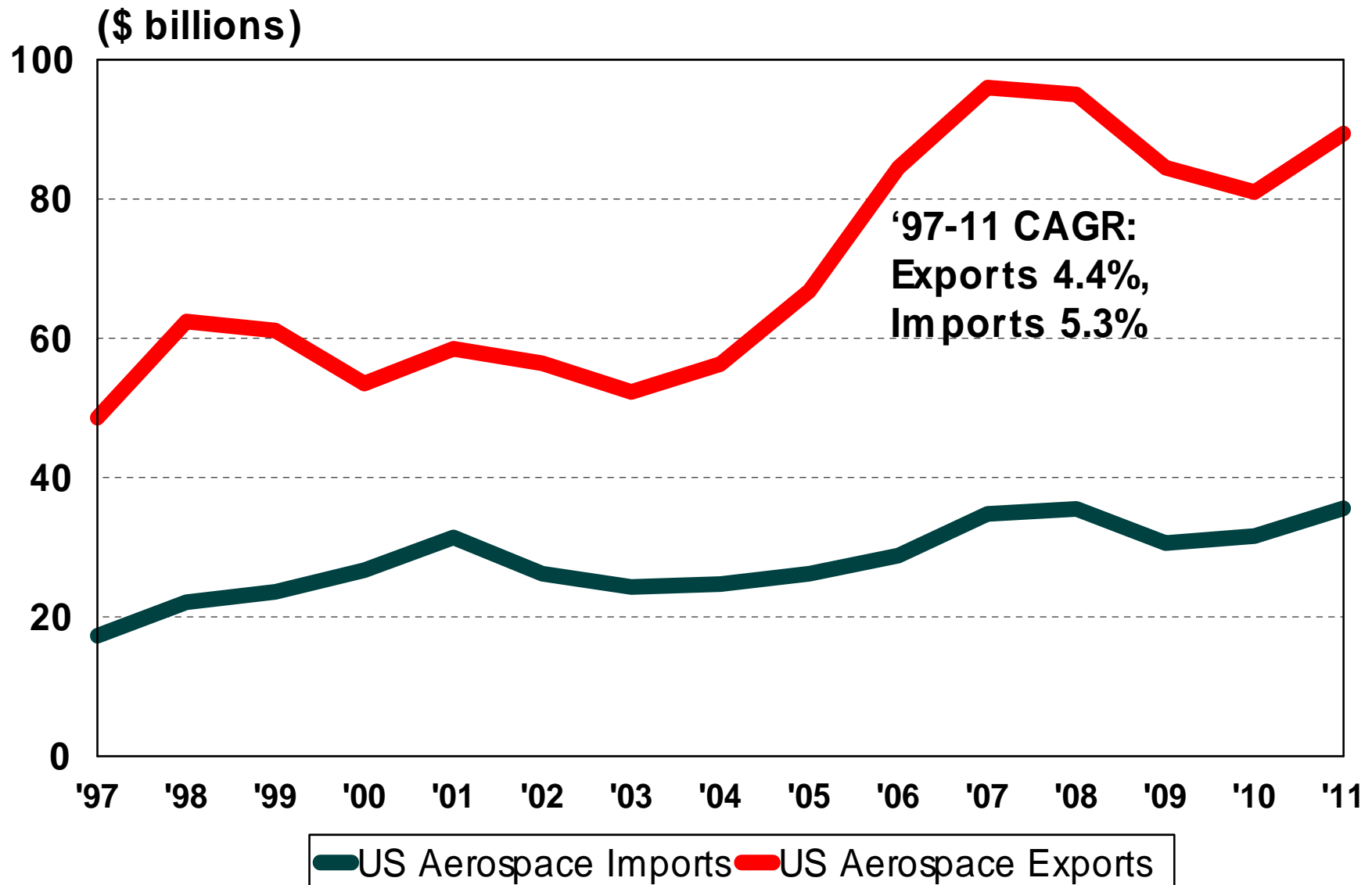
Civil Helicopter Deliveries By Manufacturer



The Big Aircraft Builders



Aerospace Trade: Strong US Surplus

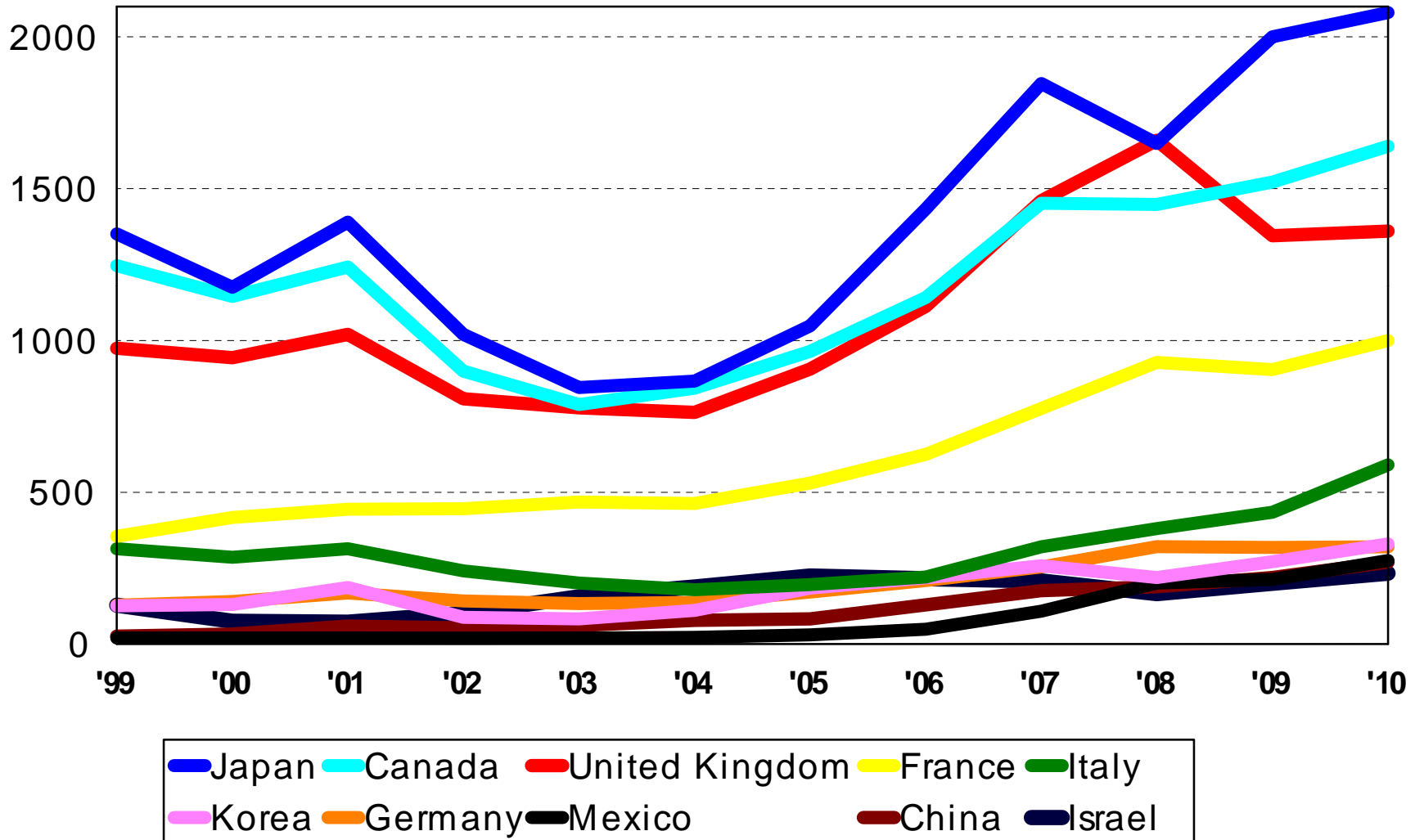


Source: US ITC

US Aircraft Industry: Global Sources

Aircraft Parts Imports To US By Origin

(Value in Then-Year \$ Mns)



Source: ITC NAIC 336413; top 10 countries (in order, as of 2010)

Growth Rates By Supplier Nation

<u>Source (To US); Excludes Engine Primes (UK, France, Canada); Largest to Smallest</u>	<u>Engines/Parts '00-'10</u>	<u>AC Parts '00-'10</u>
Germany	2.7%	8.5%
Japan	9.7%	5.8%
Mexico	23.7%	17.1%
Italy	14.1%	7.4%
Israel	10.4%	12.1%
Poland	38.5%	27.2%
China	22.0%	23.3%
Singapore	18.5%	5.9%
Sweden	4.5%	11.5%
Belgium	8.4%	10.0%
Korea	8.2%	10.0%
Total US Imports	3.7%	8.5%

Supplier Dynamics

- China, Mexico growth strong (from low base); otherwise all high skill/high wage countries.
- If anything, balance shifting back towards high skill/high wage countries.
 - Skilled wage inflation in developing economies.
 - Higher freight costs.
 - Trend towards advanced materials.
 - Greater manufacturing automation/capital intensiveness.
 - But, OEMs increasingly able to disaggregate manufacturing.
- WTO-ATCA remarkably effective (http://www.wto.org/english/docs_e/legal_e/air-79.pdf).
 - But greater military export importance means more civil offset work for military contracts.