

Still The World's Strongest Industry... For Now

Aviation/Defense Overview And Forecast

Presentation To Kansas Economic Outlook Conference

Wichita, KS

By Richard Aboulafia

Vice President, Analysis

Teal Group Corporation

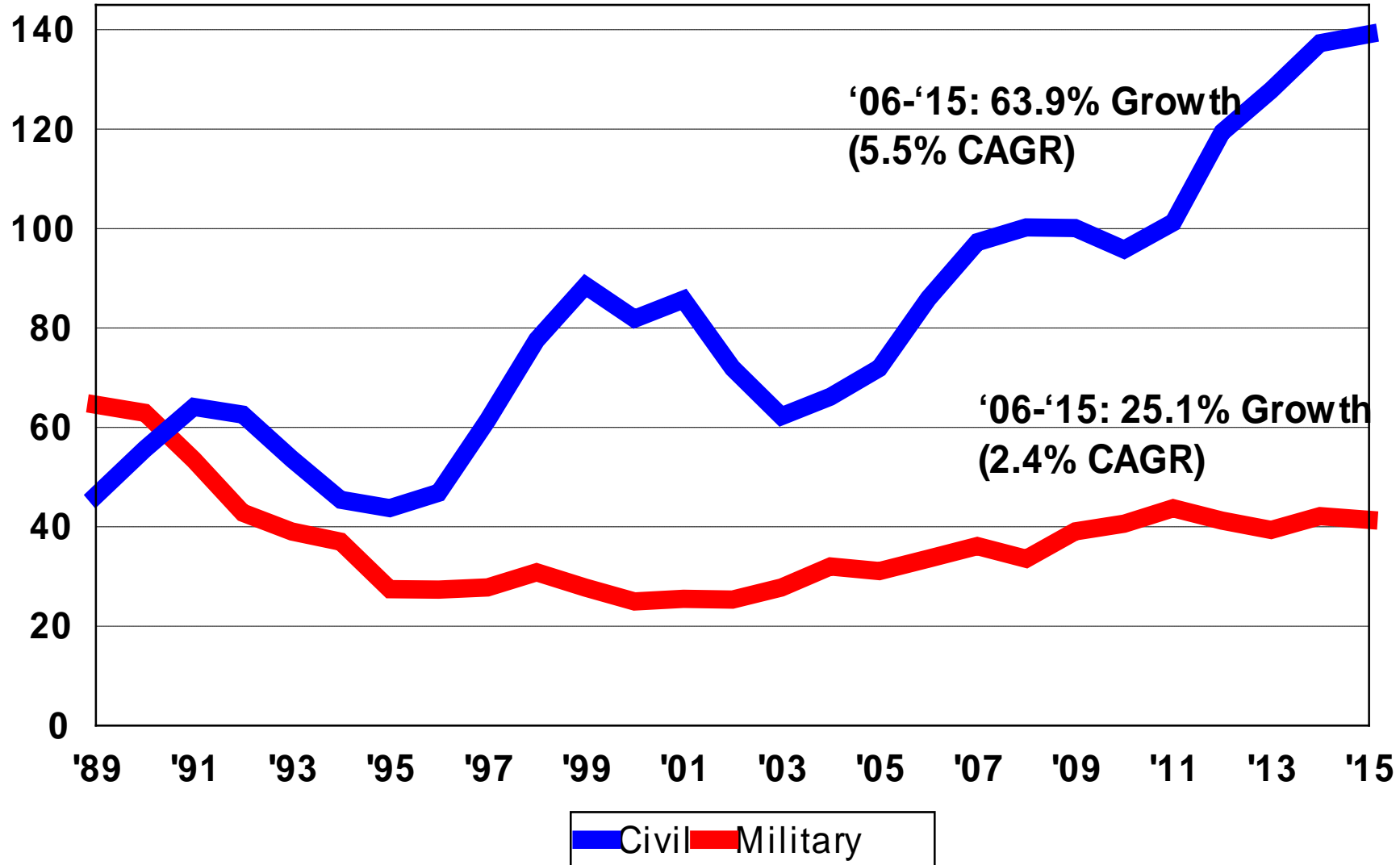
www.tealgroup.com

September 2016

Civil And Military Aircraft Deliveries

Aggregate 2006-2015: 53% Growth (4.8% CAGR)

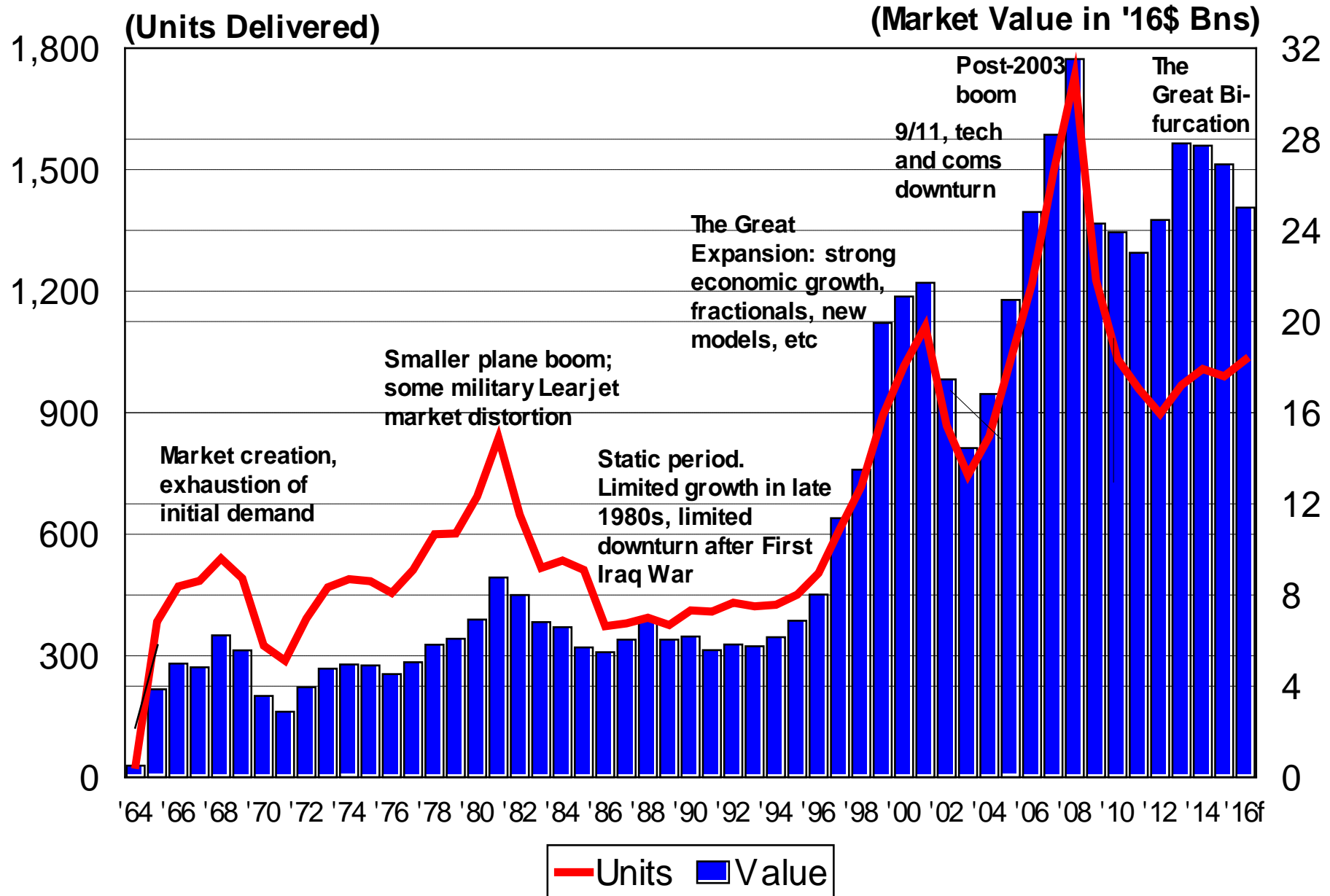
(Market Value in 2016 \$ Bns)



Aircraft Markets, Through Good And Bad Years

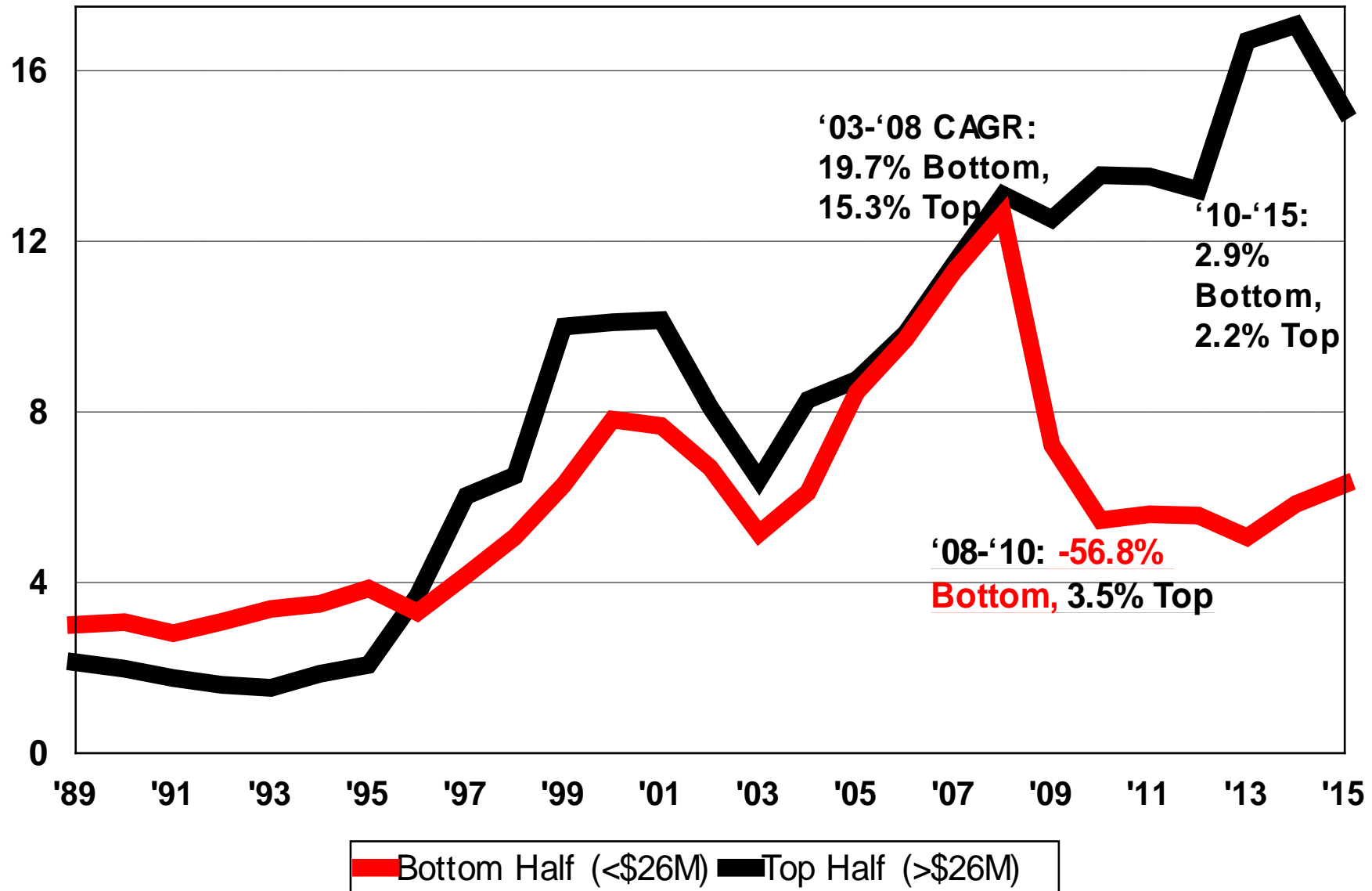
| <u>World New Deliveries</u> <u>In 2015 (2016 \$)</u> | <u>CAGR</u> <u>'03-'08</u> | <u>CAGR</u> <u>'08-'13</u> | <u>Change</u> <u>'13-14</u> | <u>Change</u> <u>'14-'15</u> |
|---|-------------------------------|-------------------------------|--------------------------------|---------------------------------|
| Large Jetliners (\$103.6 b) | 7.5% | 10.3% | 7.9% | 4.9% |
| Business Aircraft (\$22.9 b) | 17.1% | -3.7% | 5.1% | -6.3% |
| Regionals (\$7.1 b) | 4.6% | -6.5% | 17.7% | -10.5% |
| Civil Rotorcraft (\$5.4 b) | 18.2% | -1.5% | -2.6% | -9.4% |
| Military Rotorcraft(\$13.6 b) | 10.3% | 8.9% | 15.0% | -16.7% |
| Military Transports (\$5.9b) | 3.2% | -1.2% | -4.9% | 9.0% |
| Fighters (\$18.2 b) | 1.8% | 1.1% | 1.8% | 6.4% |
| <u>All Civil</u> (\$139.2 b) | <u>10.0%</u> | <u>5.0%</u> | <u>7.4%</u> | <u>1.4%</u> |
| <u>All Military</u> (\$41.4 b) | <u>3.9%</u> | <u>3.2%</u> | <u>7.1%</u> | <u>-1.7%</u> |
| <u>Total</u> (\$180.6 b) | <u>8.2%</u> | <u>4.6%</u> | <u>7.3%</u> | <u>0.6%</u> |

Business Aircraft History (W/Jetliners+RJs+Turboprops)

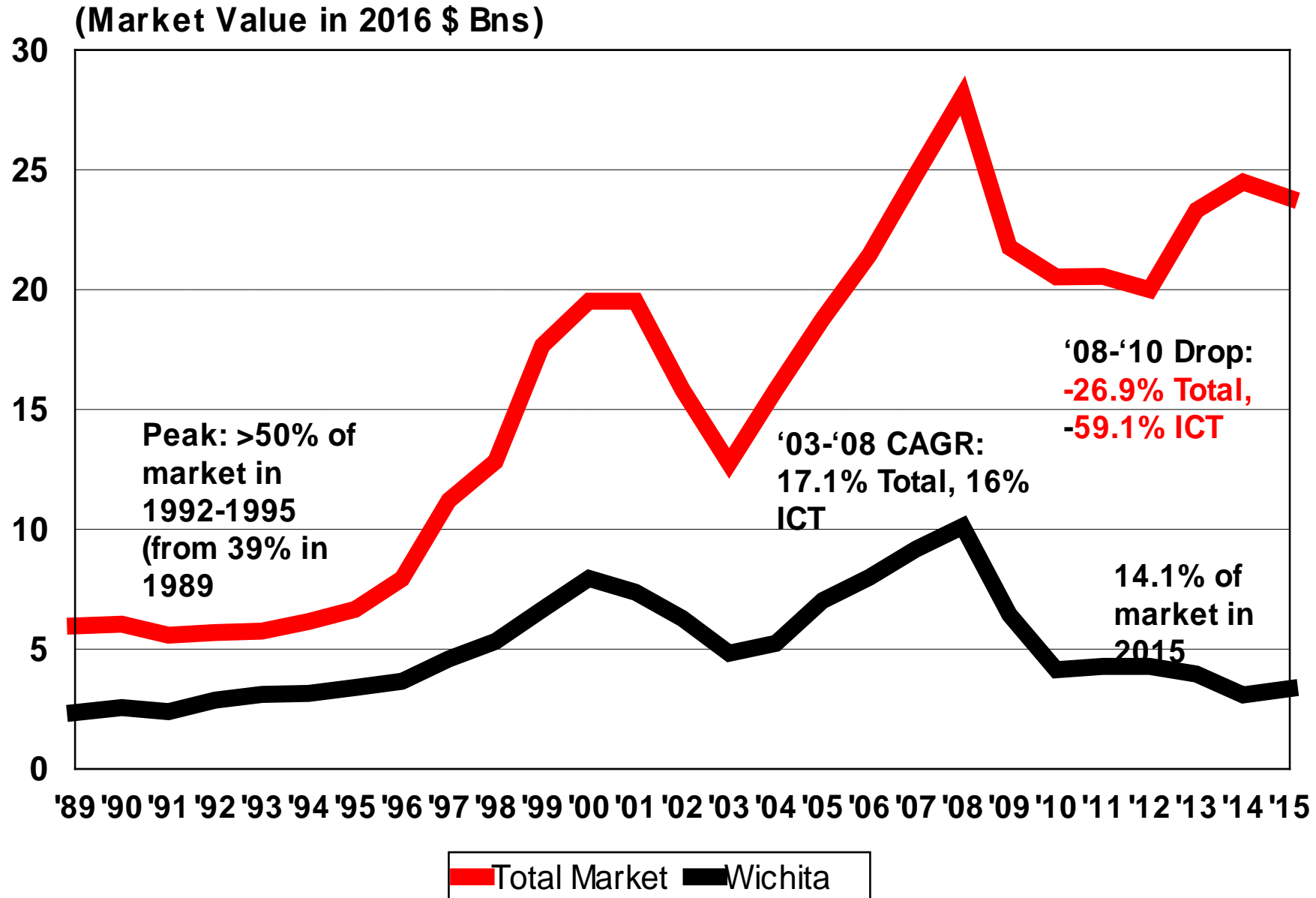


Bottom Half Bizjet Segment V. Top Half

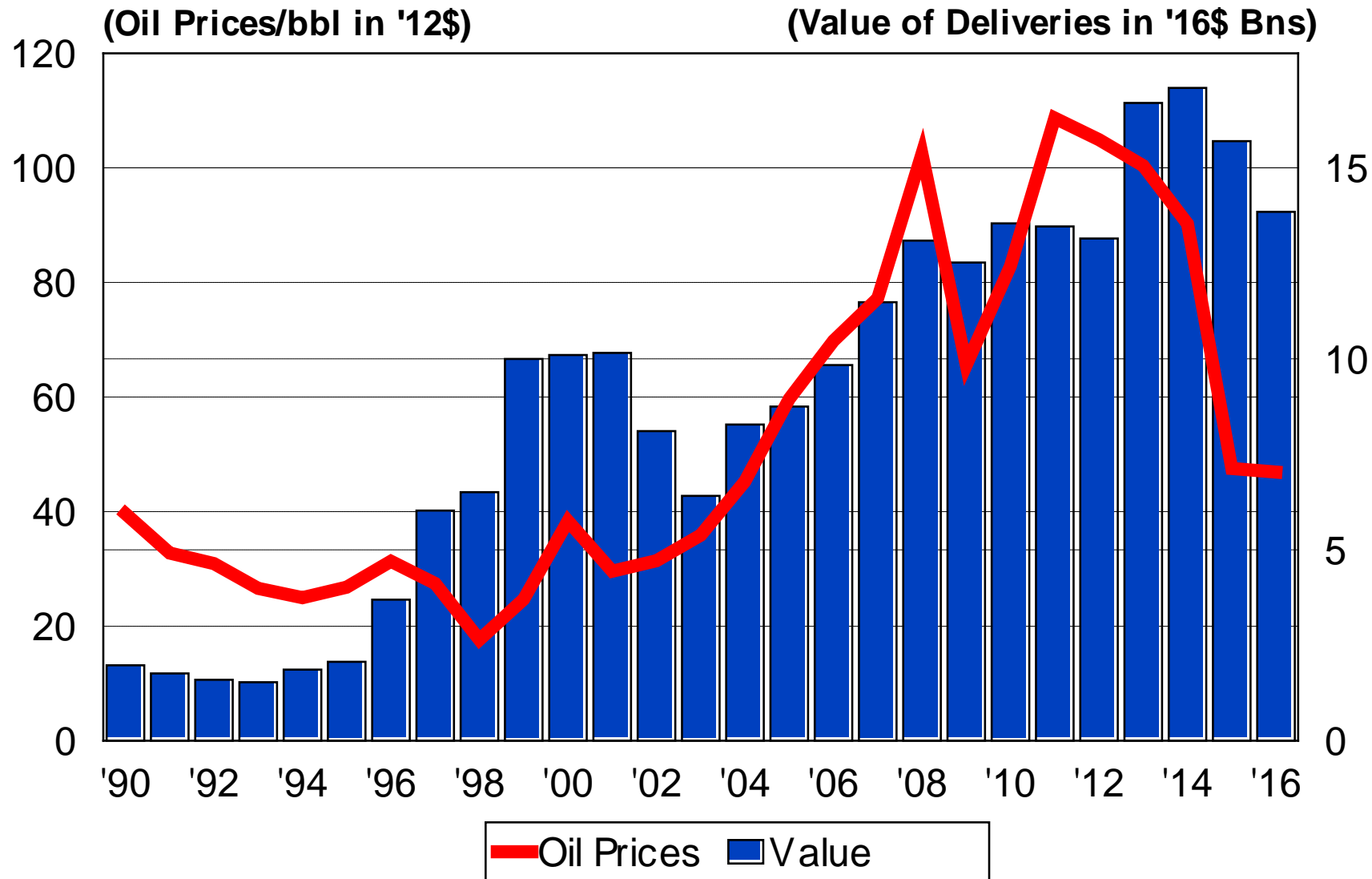
(Market Value in '16 \$ Bns)



Total Business Aircraft Market V. Wichita



Oil Prices And Top Half Jet Deliveries

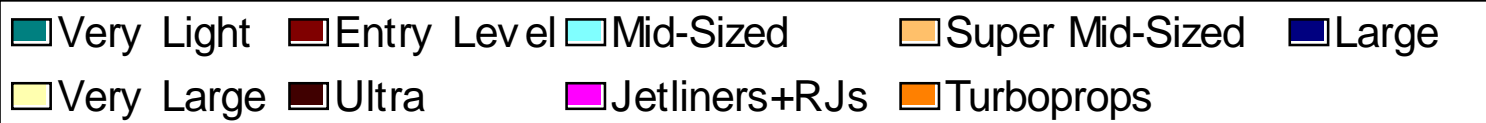
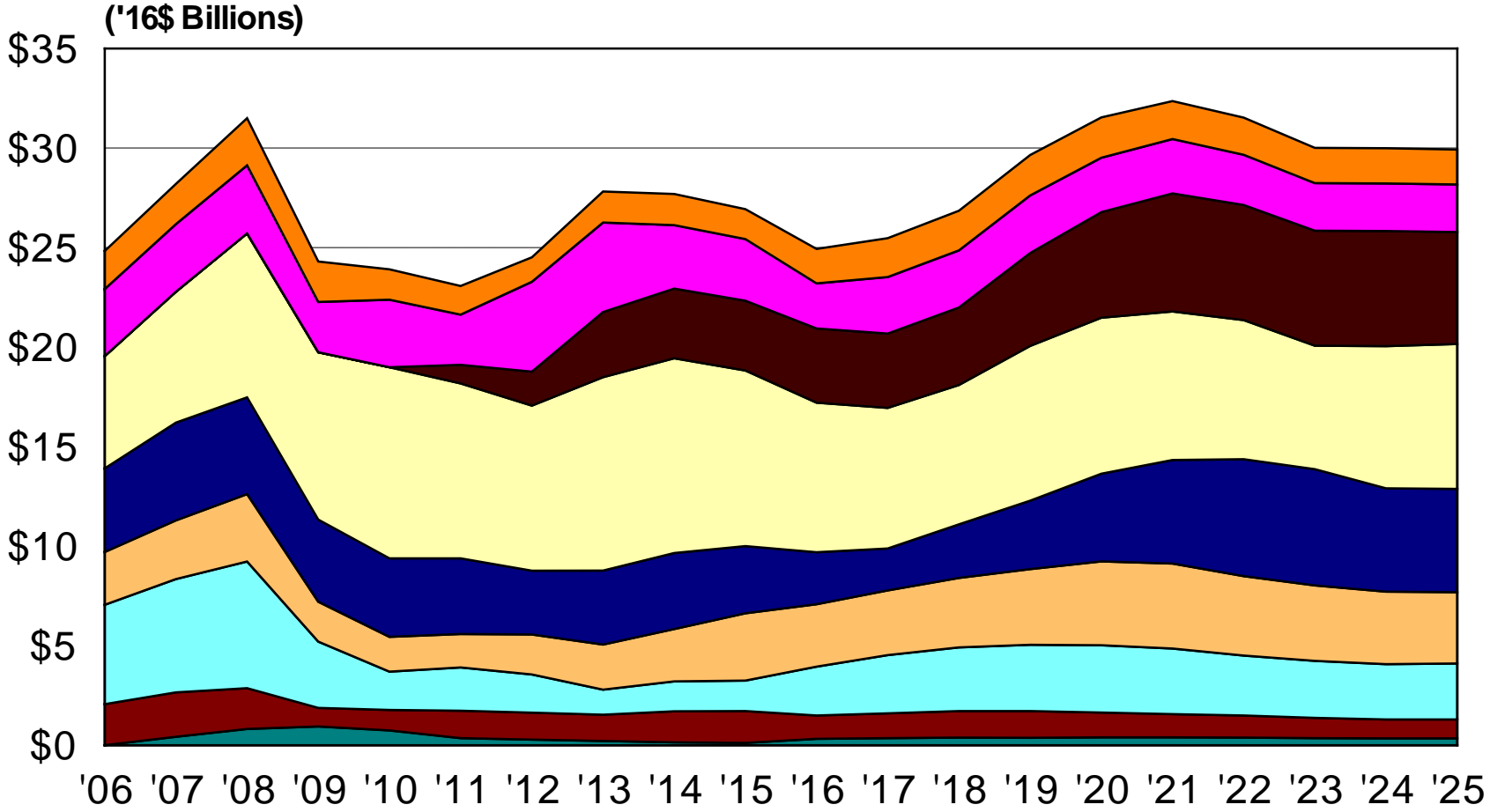


US Energy Information Administration (Annual Average Imported Crude Oil Price in 2012\$) Teal Group research



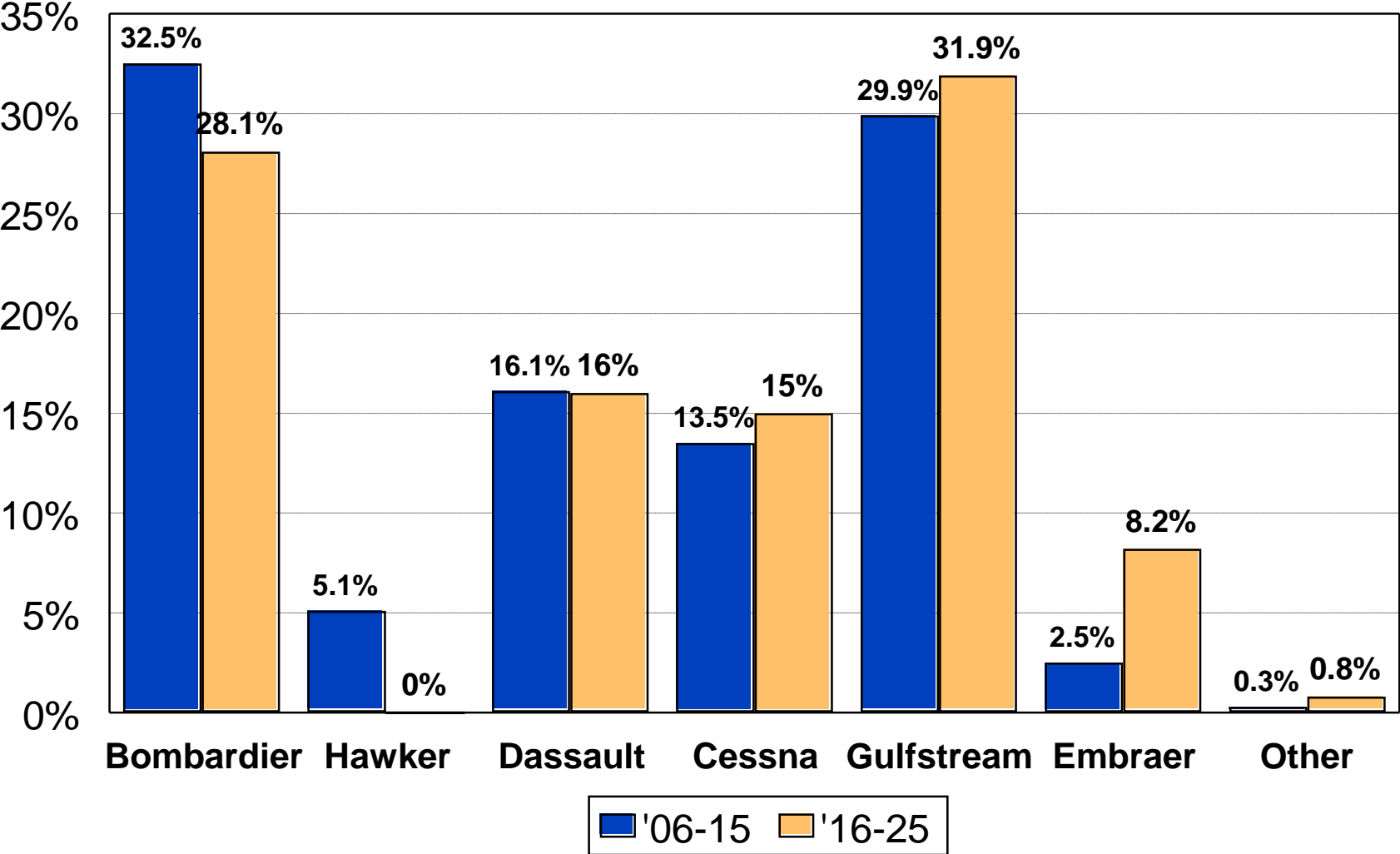
Business Aircraft Market By Class

A Gradual Shift Towards Larger Aircraft



Business Jet Manufacturer Market Shares

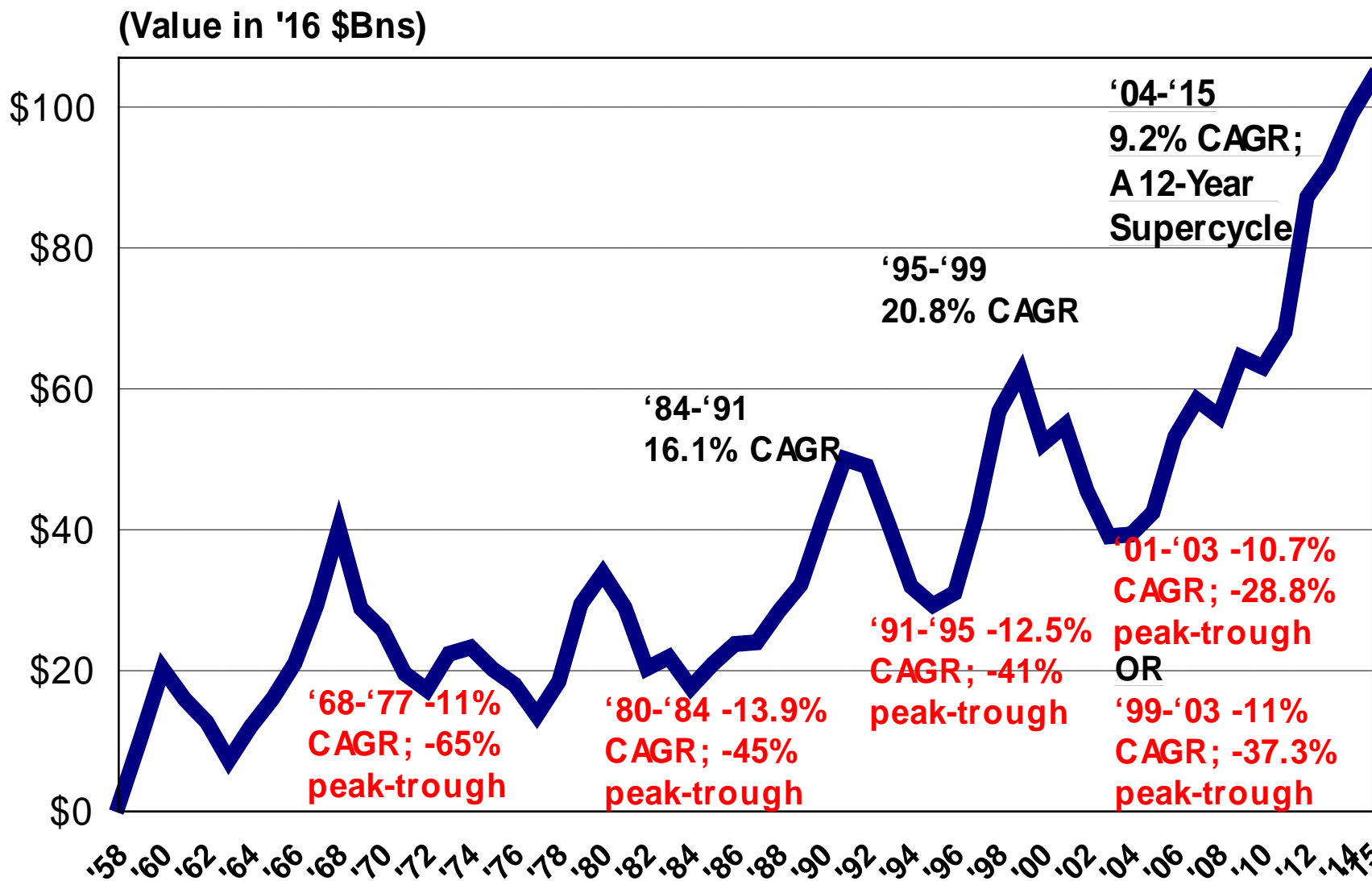
By Deliveries Value, 2016-2025 Vs 2006-2015



Excludes jetliners, RJs, turboprops

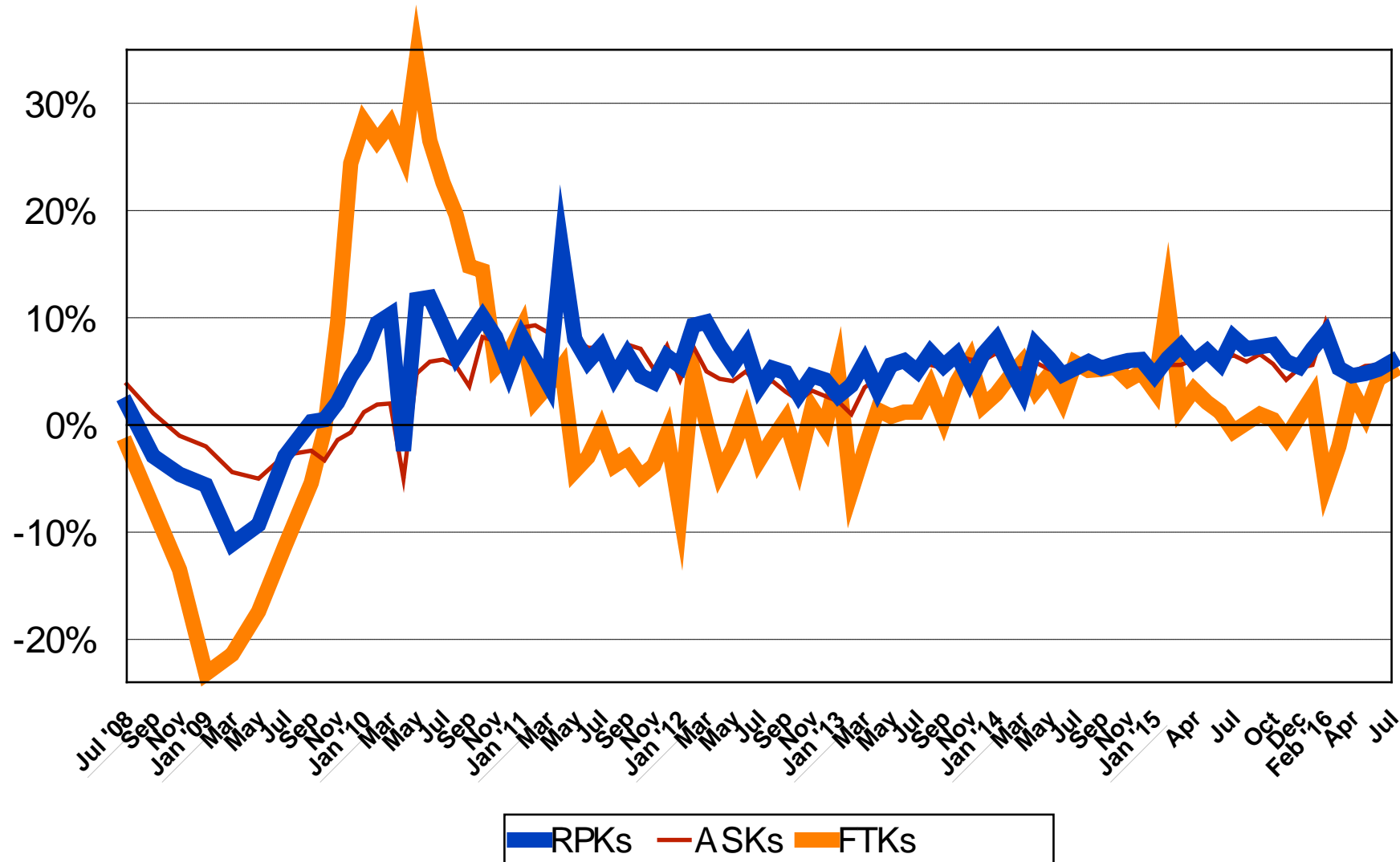
Our Forgotten Nemesis...Cyclicality

Large Jetliner Deliveries By Value



Y/Y Traffic: Respectably Strong Numbers

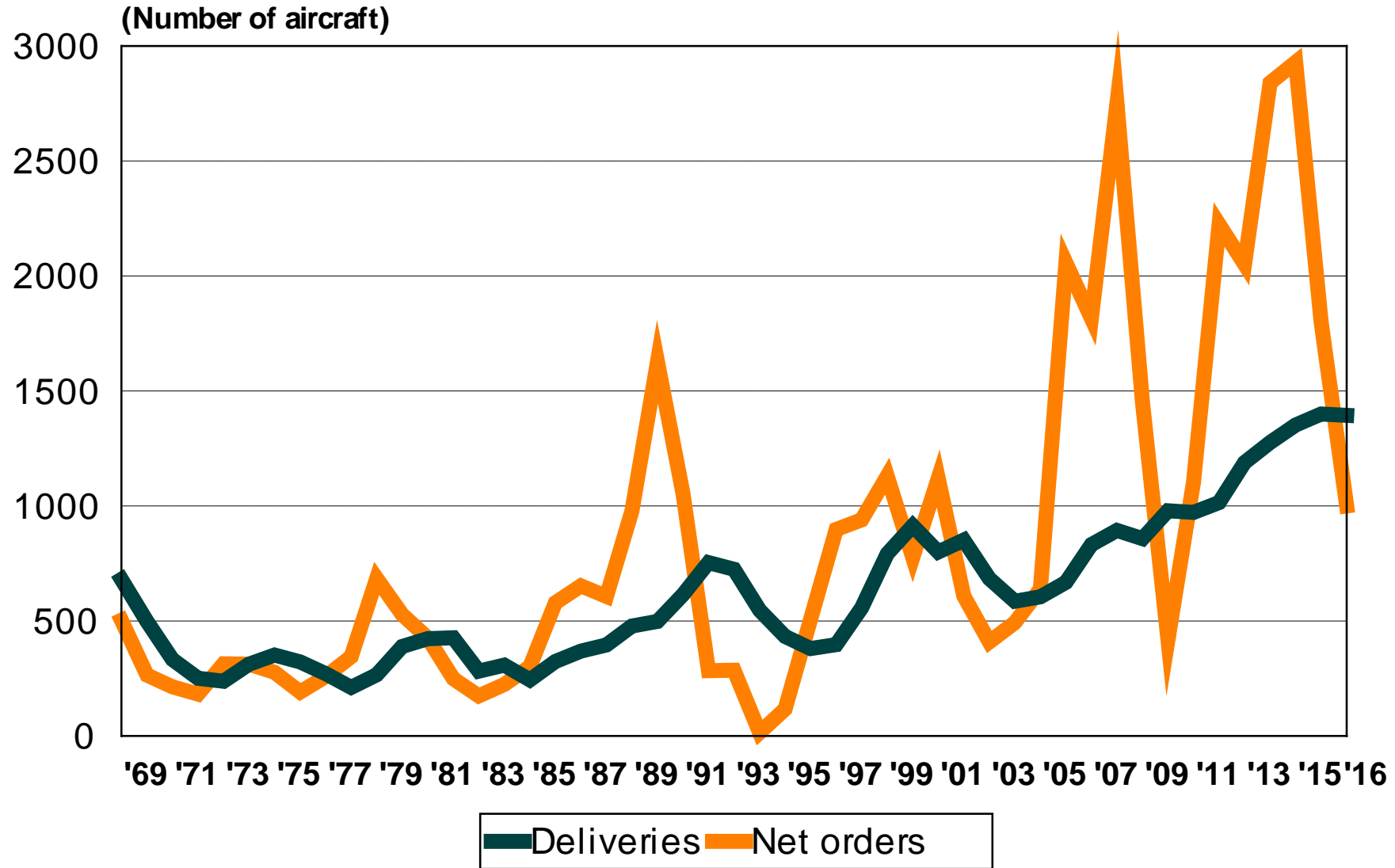
2015 Totals: RPKs 6.5%, ASKs 5.6%, FTKs 2.2%; 2014 Totals: RPKs 5.9%, ASKs 5.6%, FTKs 4.5%; 2013 Totals: RPKs 5.2%, ASKs 4.8%, FTKs 1.4%



Source: IATA



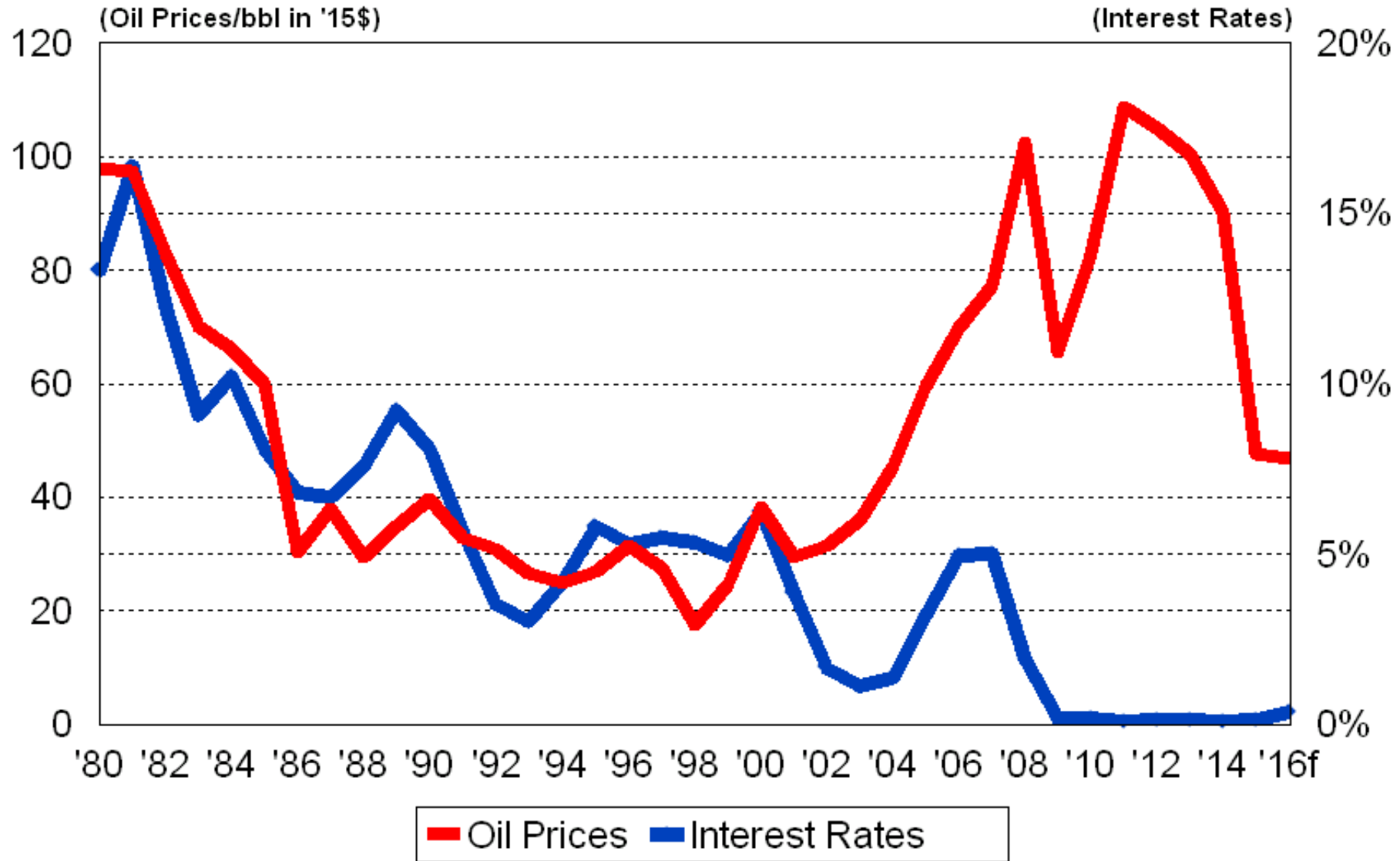
Historical Jetliner Orders And Deliveries



All Airbus and Boeing aircraft



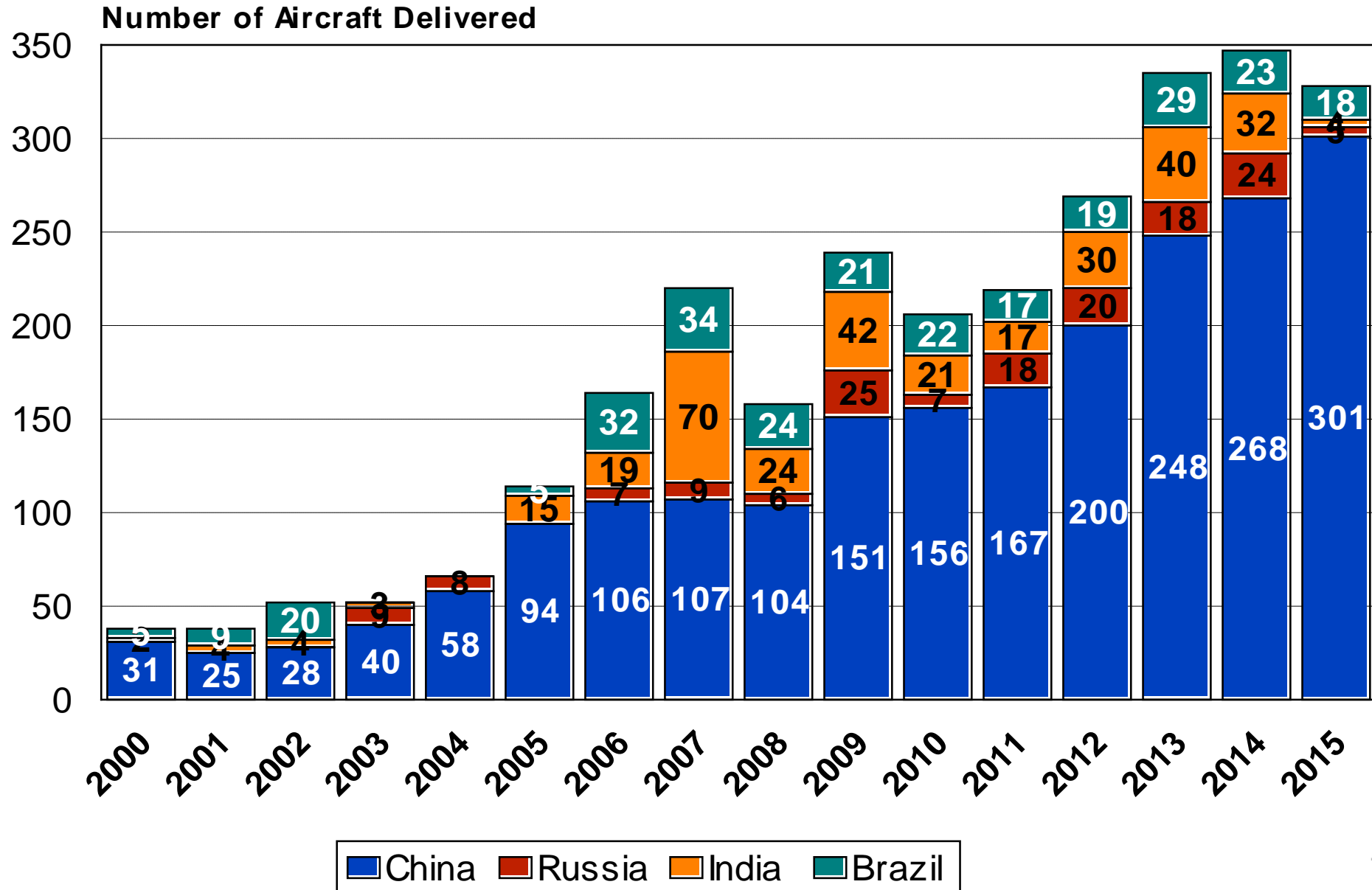
Oil Prices And Interest Rates



EIA Annual Average Imported Crude Oil Price; Federal Funds Effective Rate



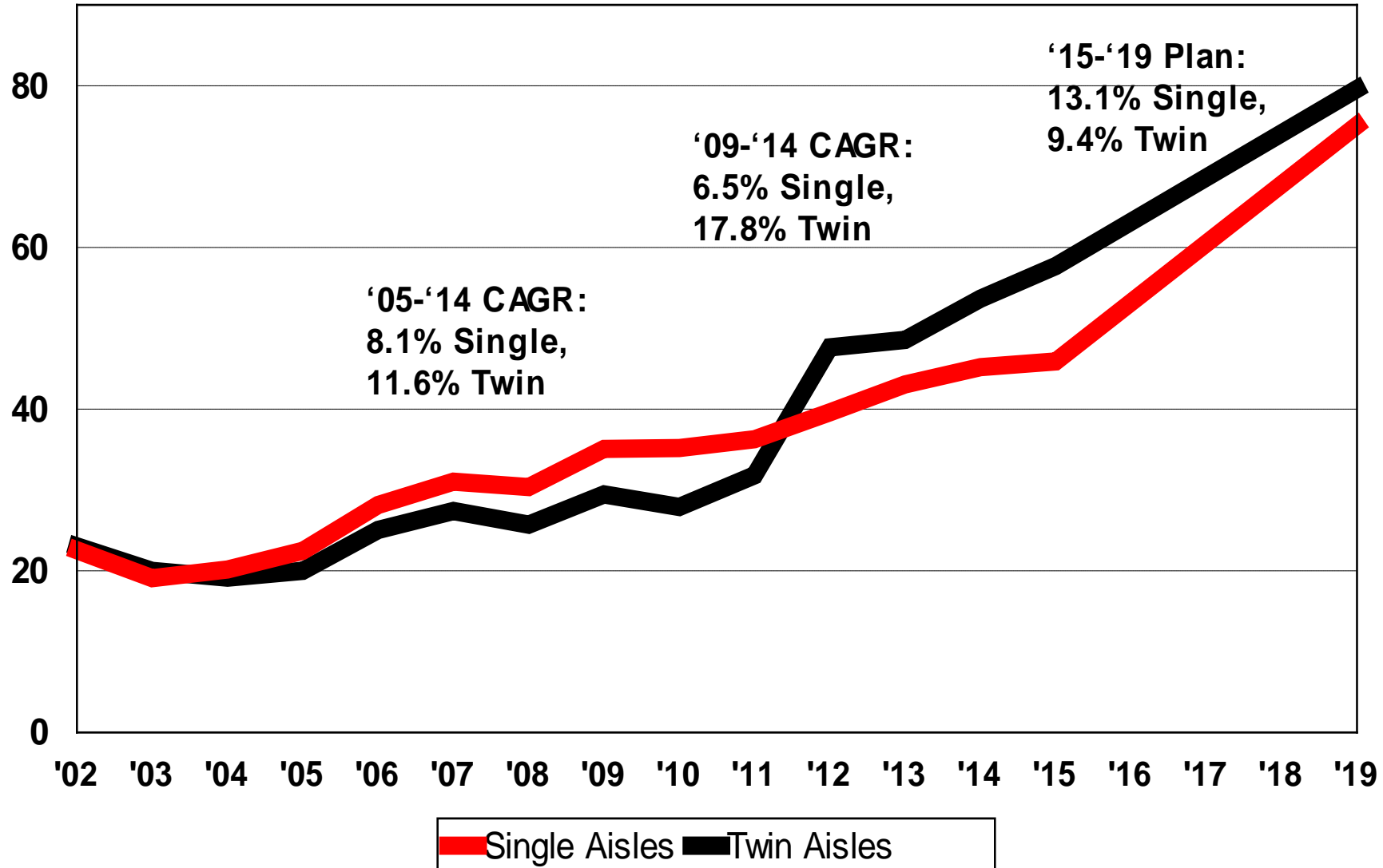
BRIC Market Large Jet Deliveries



Single And Twin Aisle Deliveries

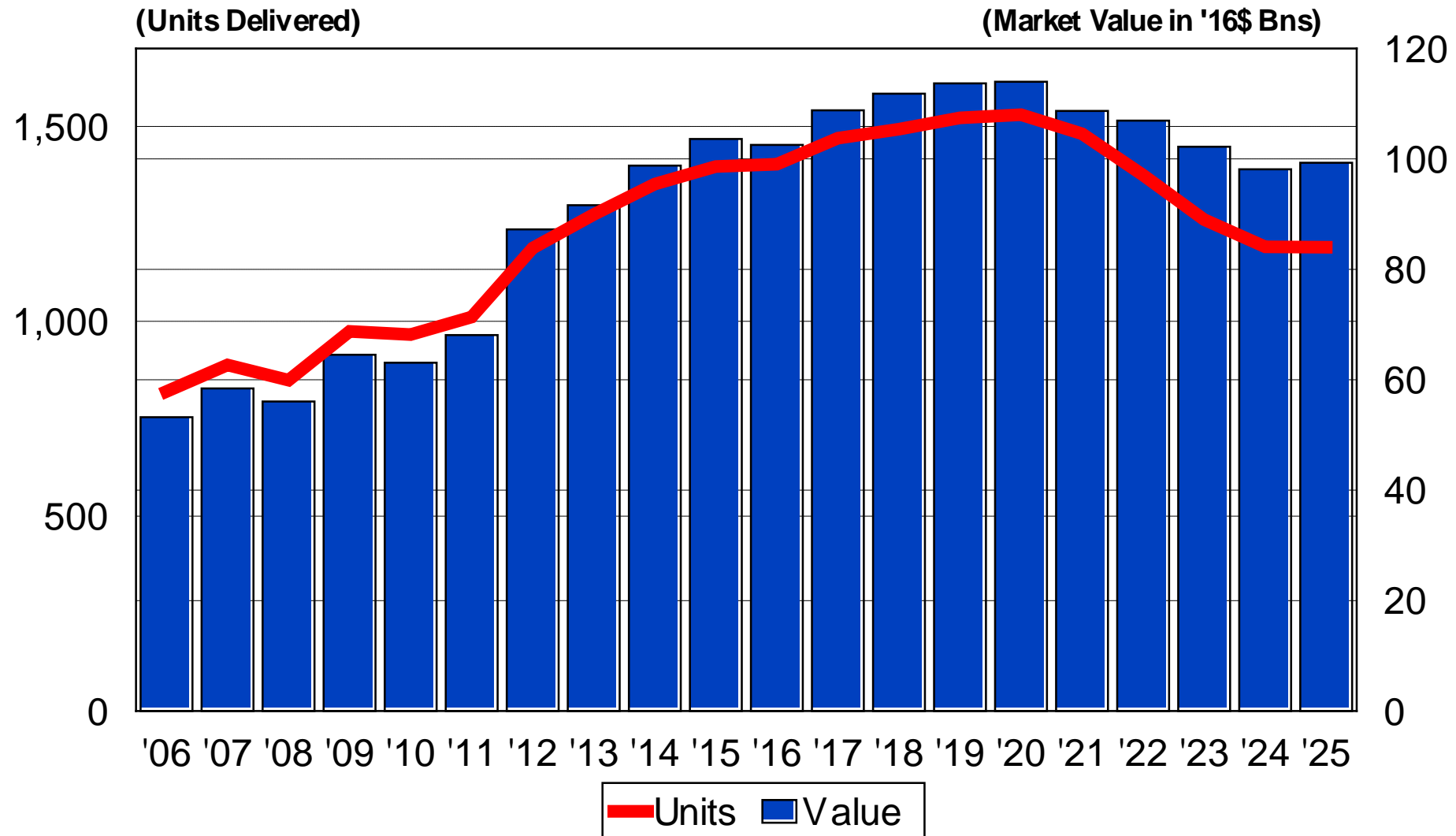
Powered By...Hubris

(Market Value in '15 \$ Bns)



Commercial Jetliners History And Forecast

An Inevitable Correction Looms

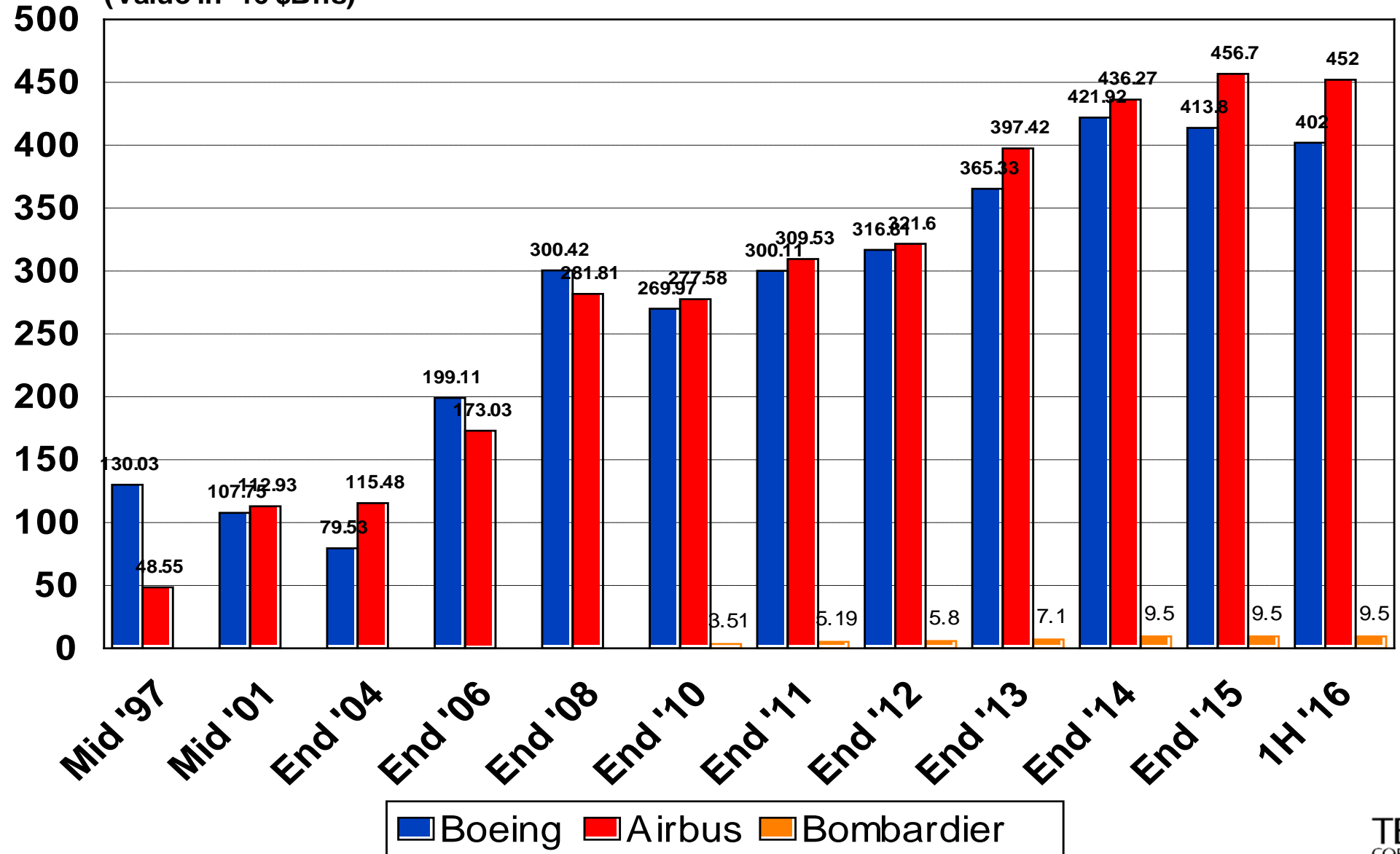


Airbus, Boeing, CSeries, C919, MS-21; includes KC-30, KC-46, P-8

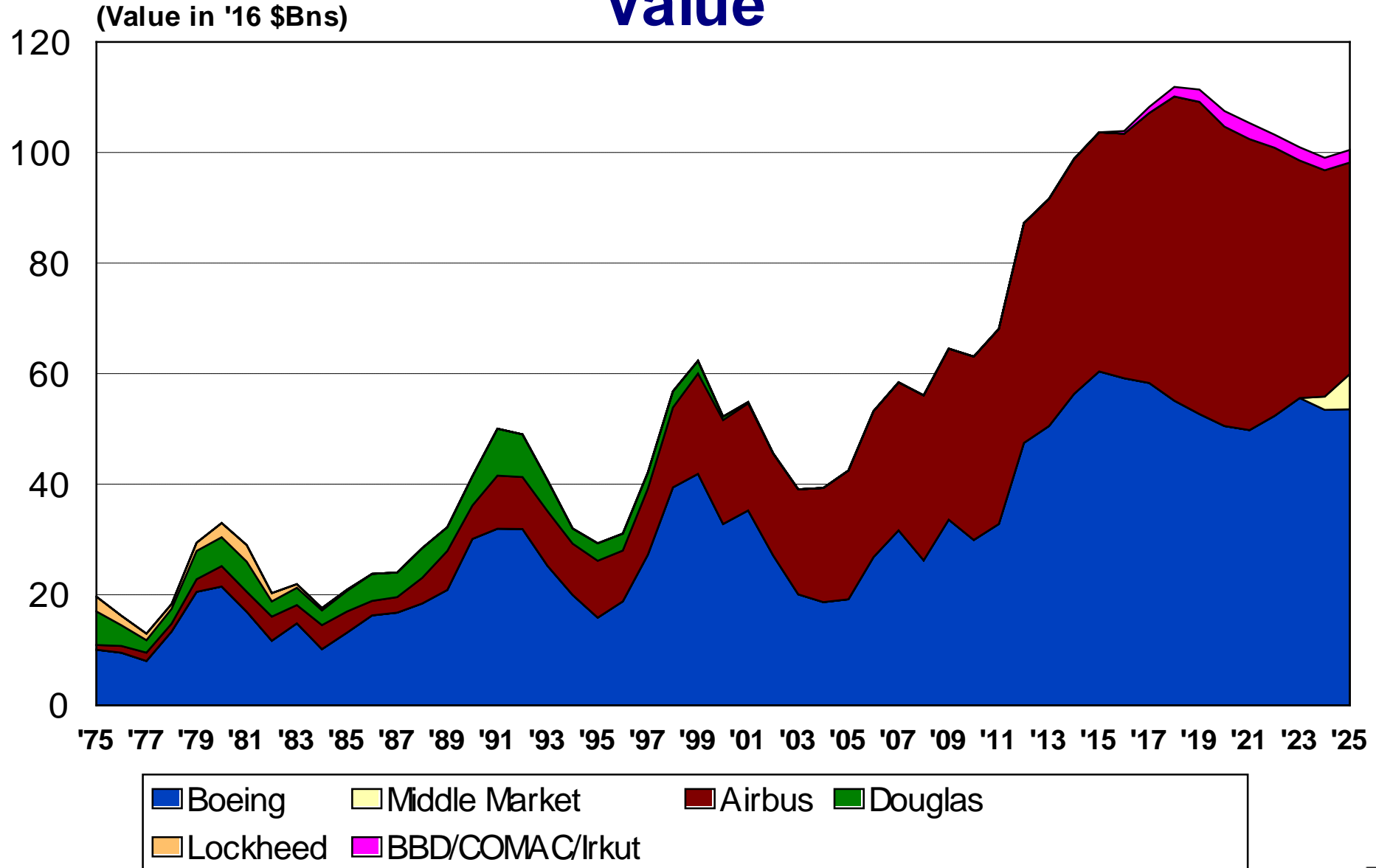


Comparative Backlog Values

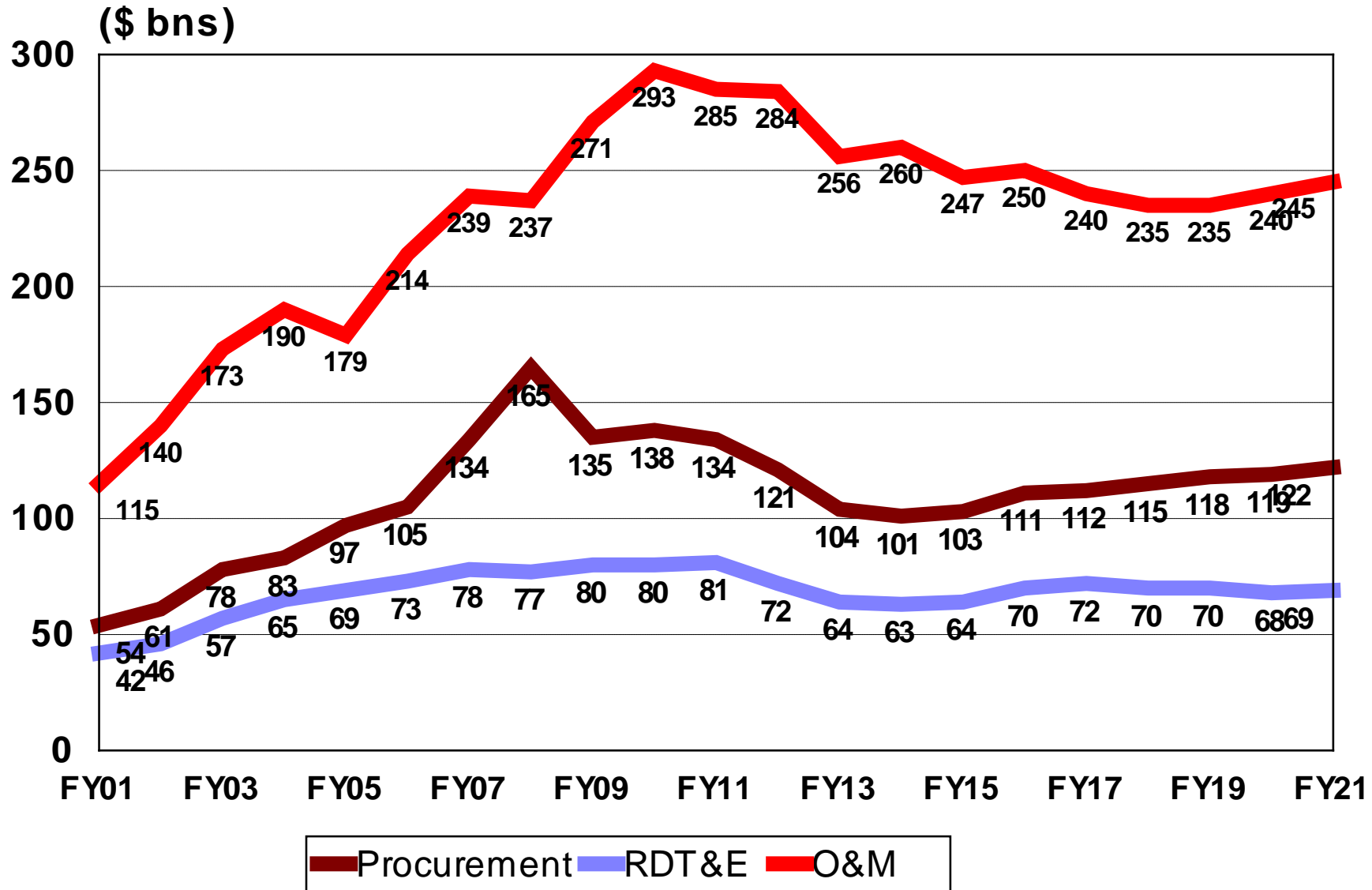
(Value in '16 \$Bns)



Large Jetliner Market Shares By Deliveries Value



DoD Investment, O&M Funding

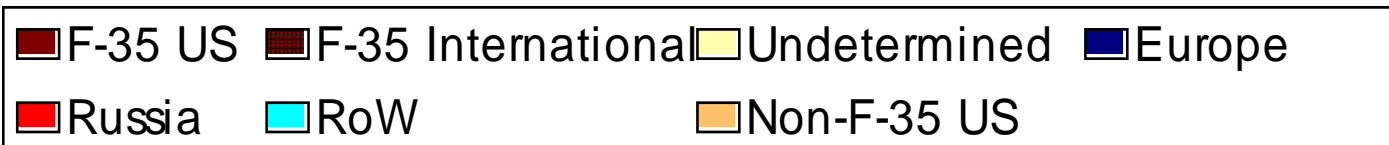
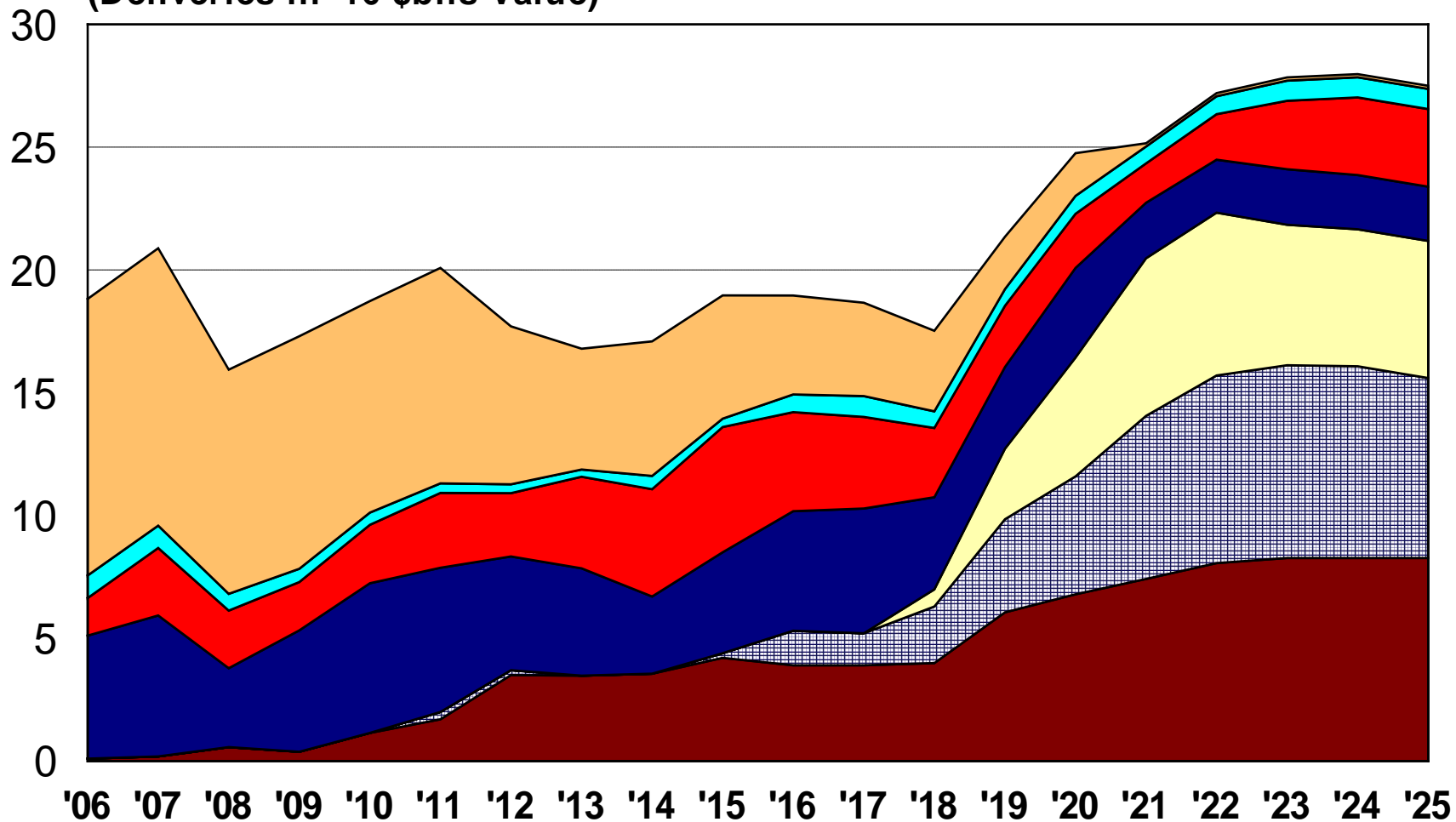


Then-year dollars



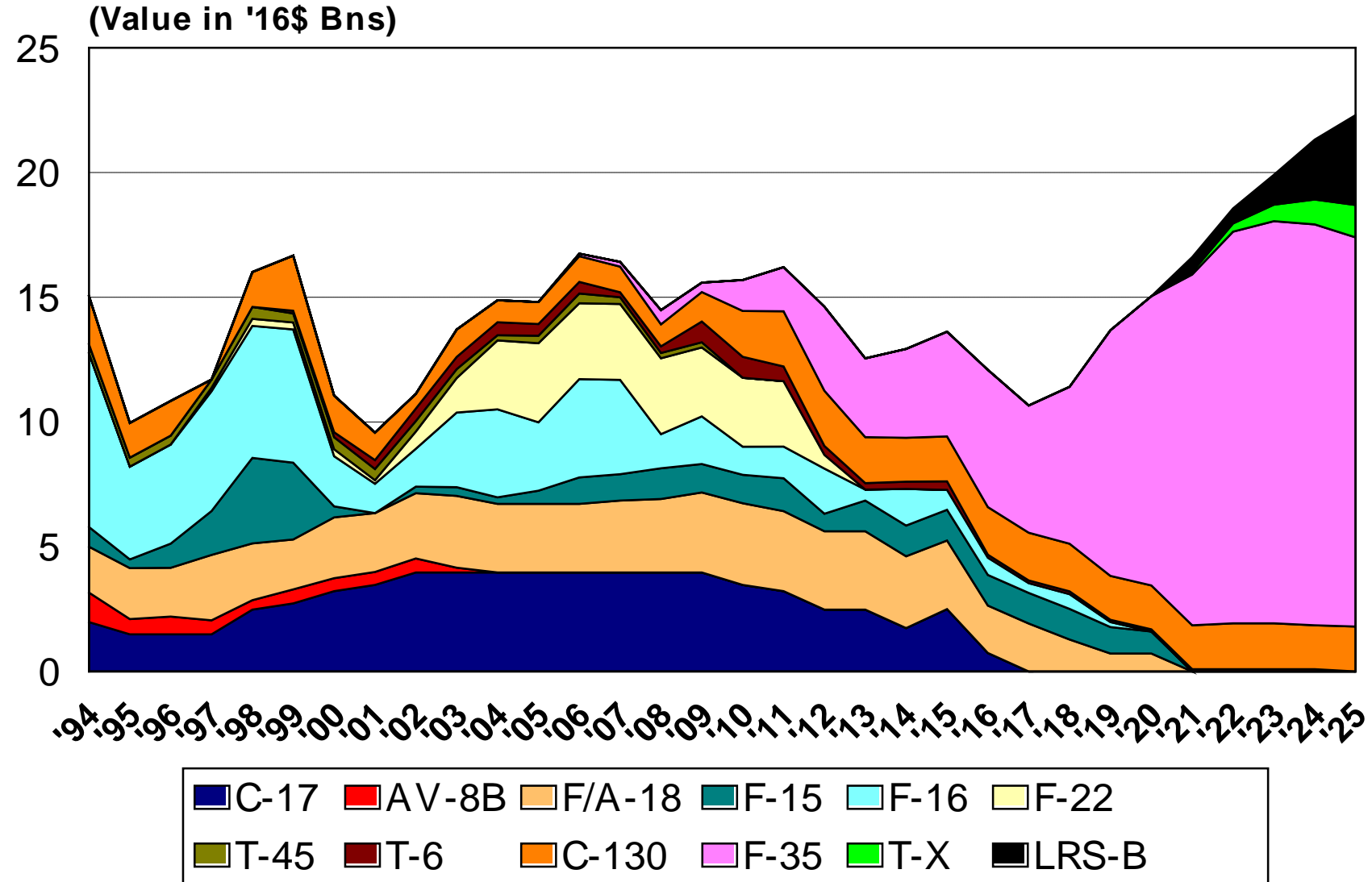
World Fighter Production Shares

(Deliveries in '16 \$bns Value)



The US Military Fixed Wing Waterfall

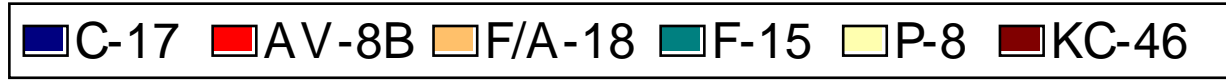
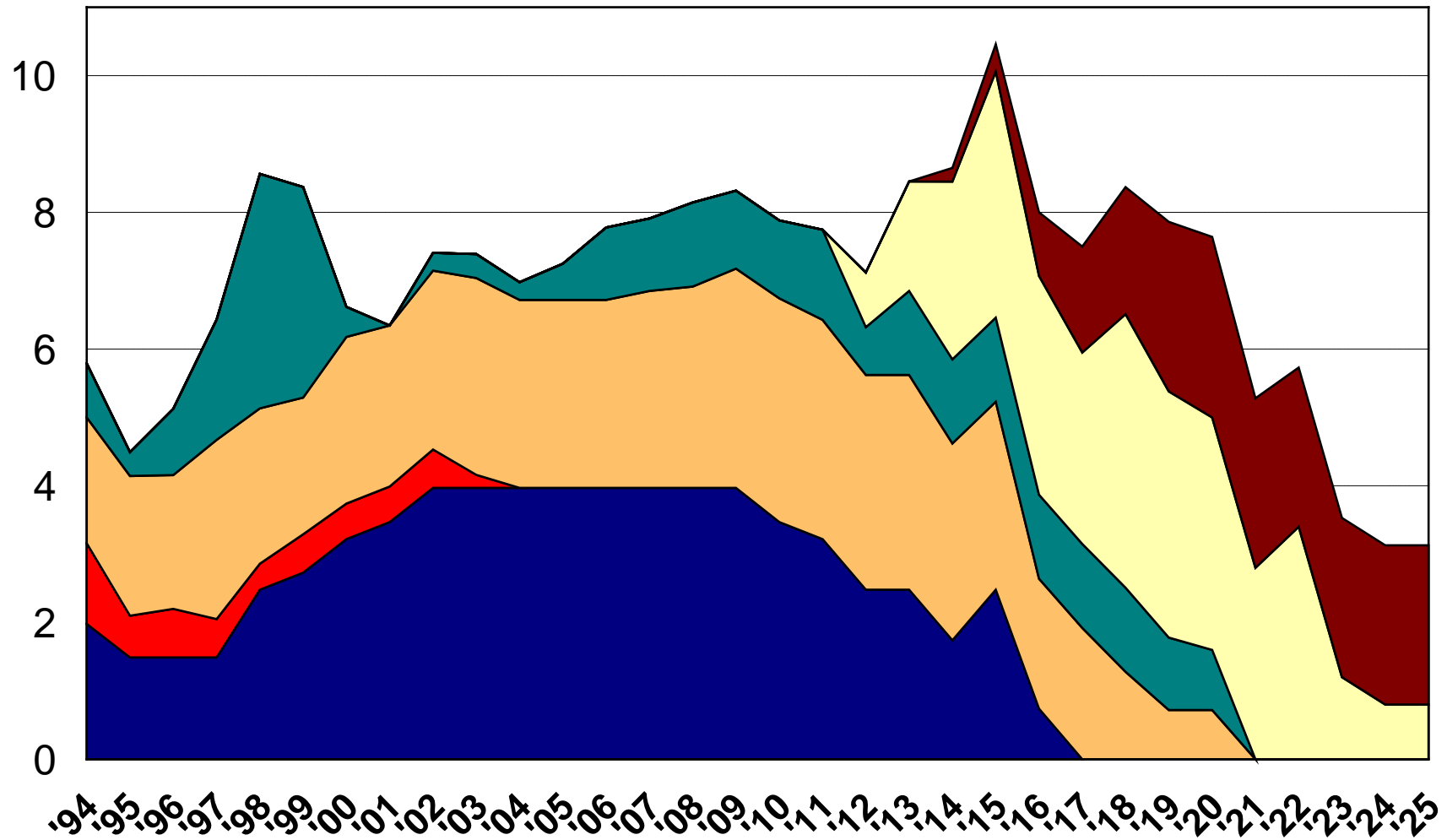
Much Riding On The F-35...But There's A New Wave Coming



Excludes jetliner derivatives

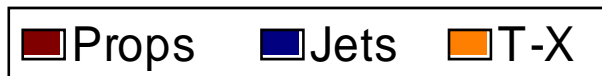
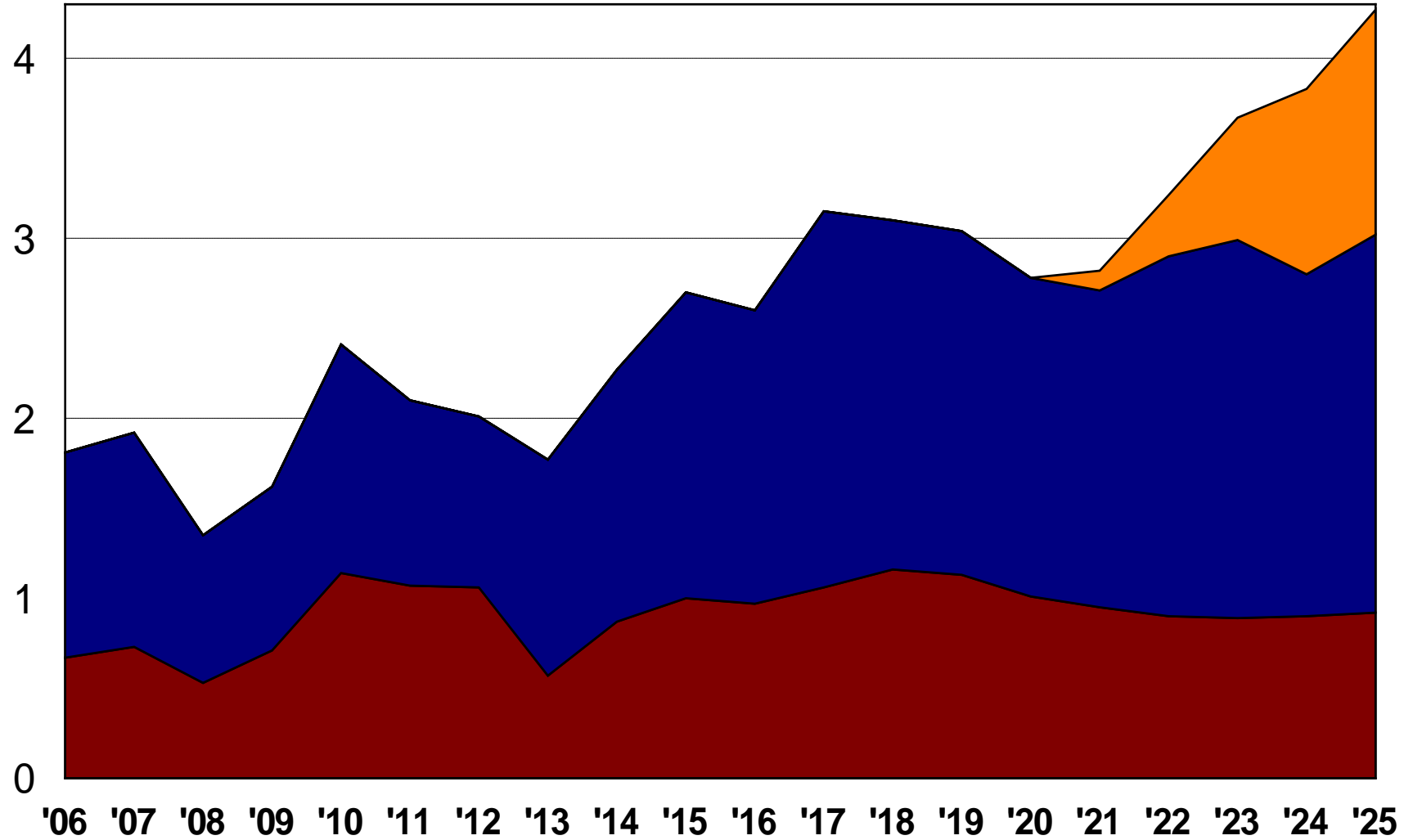
Boeing Military Fixed Wing Deliveries

(Value in '16\$ Bns)

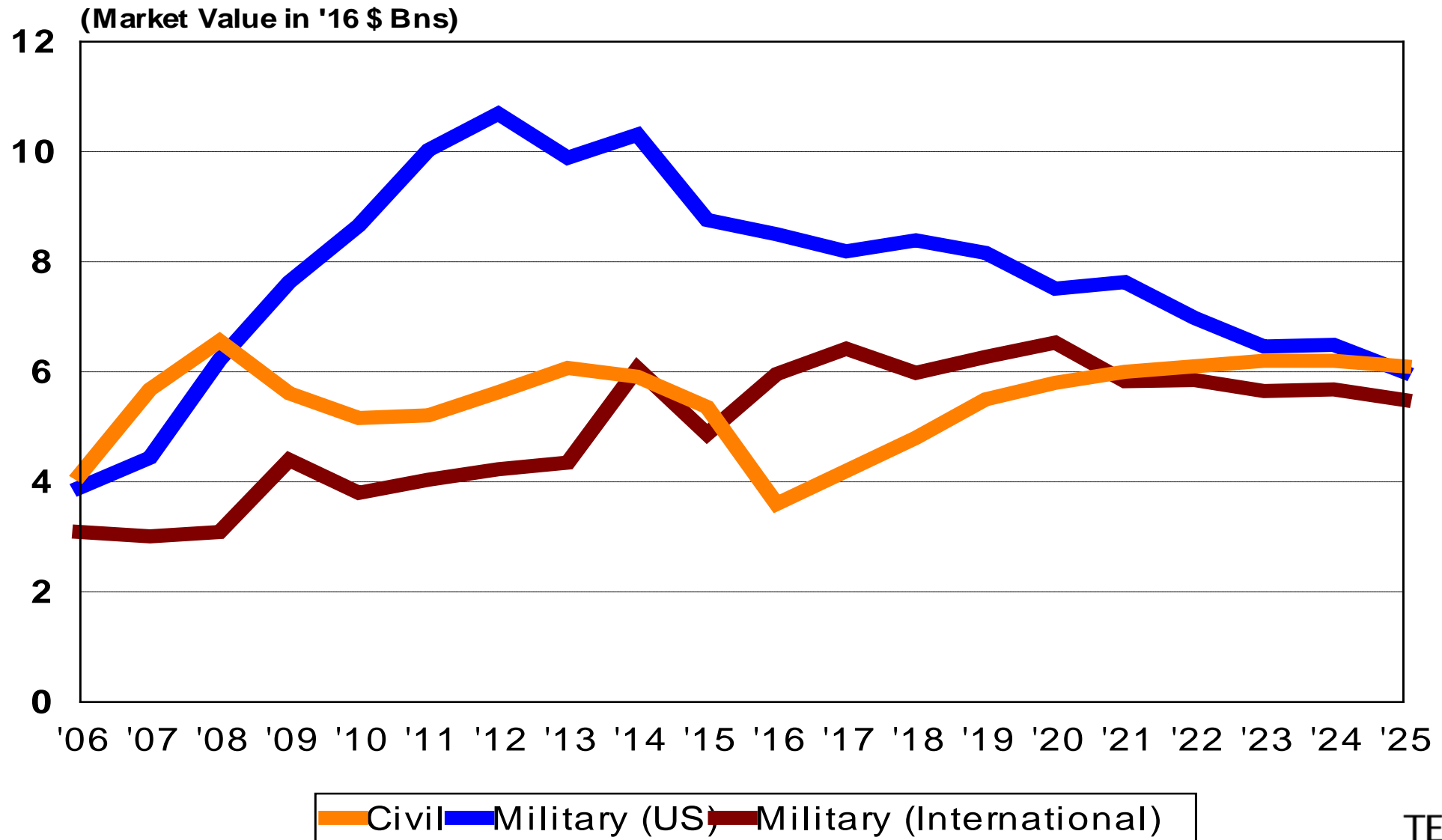


Trainer/Light Attack Aircraft Market Outlook

(Share By '16 \$bns Value)

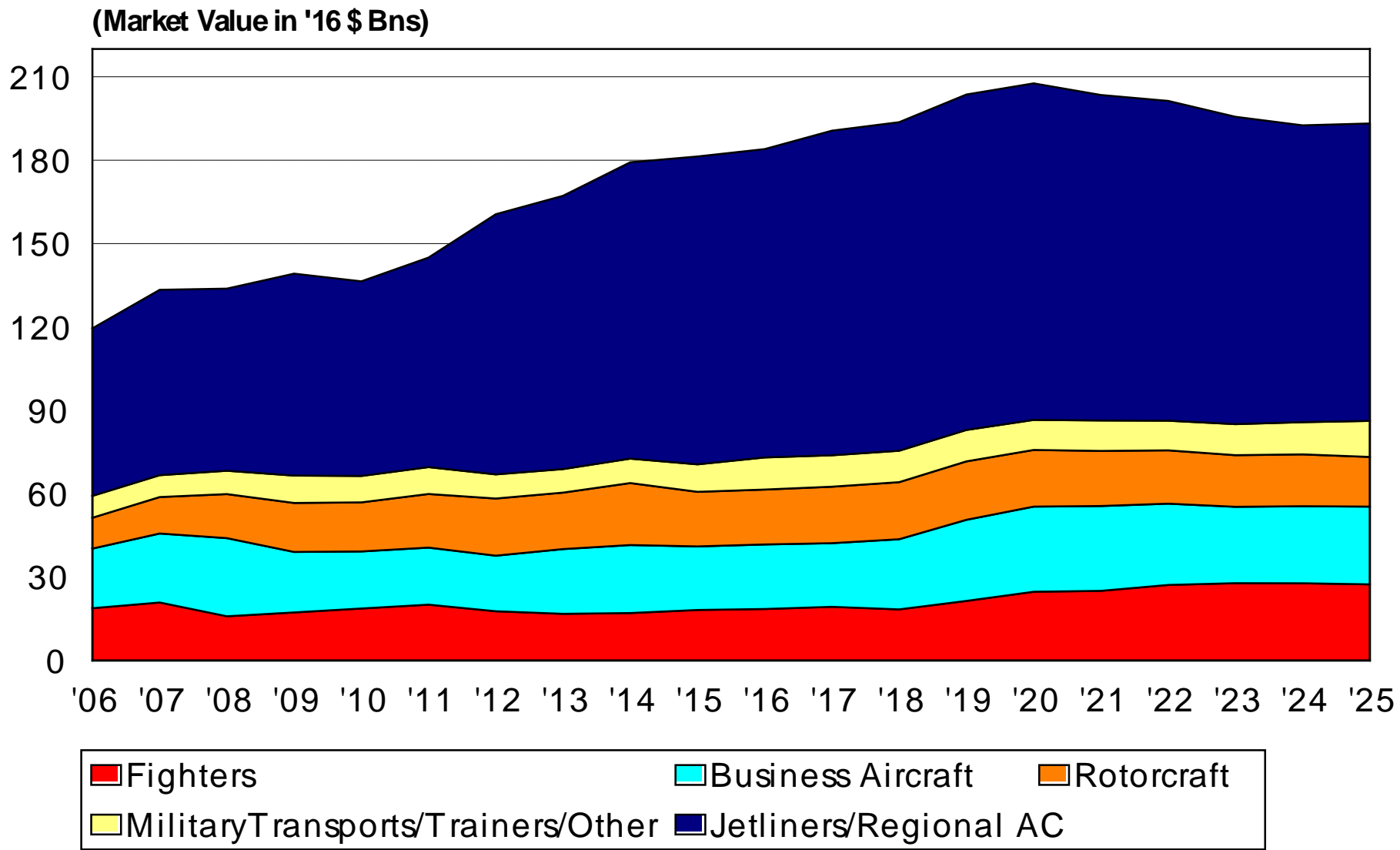


US Military Rotorcraft Market Falling; International Military Growing; Civil Falling



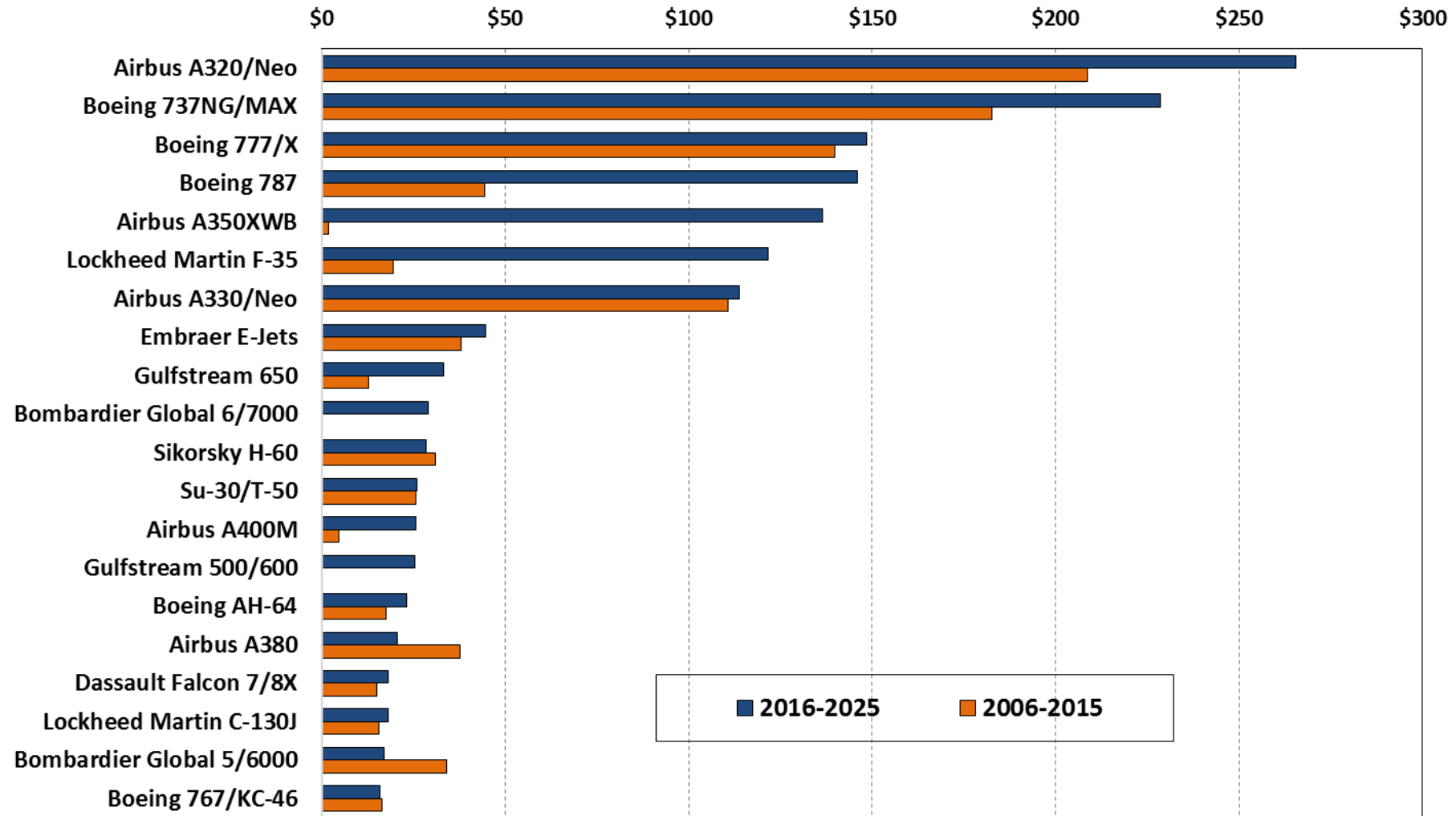
Aircraft Production 2006-2025

Still Growing, For Now....



Top 20 Aviation Programs; Volume Matters

Cumulative Deliveries Value in '16 \$ Bns



Global Aircraft Market Outlook In One Page

| <u>Market</u> | <u>2016</u> | <u>Risk</u> | <u>Elevator Comment</u> |
|-----------------------|--------------|-------------|--|
| Large Jetliners | 0.1% | | Tough to de-rail the ramp, but fuel prices and China are big concerns. Execution too. |
| Business Aircraft | -8.5% | | Weak emerging markets and resource-extraction country/company demand. |
| Regionals | -1.1% | | Scope clause is only big risk. |
| Civil Rotorcraft | -32.5% | | Getting ugly. Too many new models aimed at a weak Segment (oil). |
| Military Rotorcraft | 3.7% | | Will trend down as programs of record end/slow; no risk of accelerated downturn. |
| Military Transports | 24.6% | | Last of C-17s/A400M ramp; Only risk is A400M execution; C130J benefits if it's a problem. |
| Fighters | 0.1% | | I like this market. |
| <u>All Civil</u> | <u>-2.7%</u> | | Jetliner growth not compensating for weakness in other segments; more risk from emerging markets, oil. |
| <u>All Military</u> | <u>4.5%</u> | | Global insecurity, Tension, Malice. |
| <u>Total Industry</u> | <u>-1.0%</u> | | <u>Downshifting, with more risk</u> |

