

# ***Coping With Sky-High Jet Fuel Prices***

John Heimlich — VP & Chief Economist  
Air Transport Association of America  
June 10, 2008



# The Air Transport Association of America, Inc.

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## ***Combination Services (12)***

**AirTran Airways  
Alaska Airlines  
American Airlines  
Continental Airlines  
Delta Air Lines  
Hawaiian Airlines  
JetBlue Airways  
Midwest Airlines  
Northwest Airlines  
Southwest Airlines  
United Airlines  
US Airways**

## ***All-Cargo Services (6)***

**ABX Air  
ASTAR Air Cargo  
Atlas Air / Polar Air Cargo  
Evergreen Int'l Airlines  
FedEx Corporation  
UPS Airlines**

## ***Associate Members (3)***

**Air Canada  
Air Jamaica  
Mexicana**

# A View from Above

**“Our country’s vastness and its economy depend upon commercial aviation as the backbone of national and international commerce... Global trade undergirds America’s strength and allows the United States to project its economic power. In my opinion, the commercial aviation industry [is] a crucial component of America’s economic strength. This has been true for decades, and will remain true into the foreseeable future.”**

**“We are very concerned about the instability in oil prices because it wreaks havoc on how we manage our flying-hour program across the Air Force, just as it is wreaking havoc on the pricing statistics for an airline.”**

**“It is entirely plausible that European regulators will soon challenge the aviation industry with some type of cap on carbon emissions. Reducing the carbon footprint is a top priority for many European countries. As we continue toward synchronizing standards across international borders, we could find the U.S. aviation industry affected.”**

Hon. Michael W. Wynne, Secretary of the Air Force, Aero Club of Wash., DC (May 22, 2008)

# For Whom the Bell Tolls

Eight U.S. Airline Shutdowns\* and One Bankruptcy Since End of 2007

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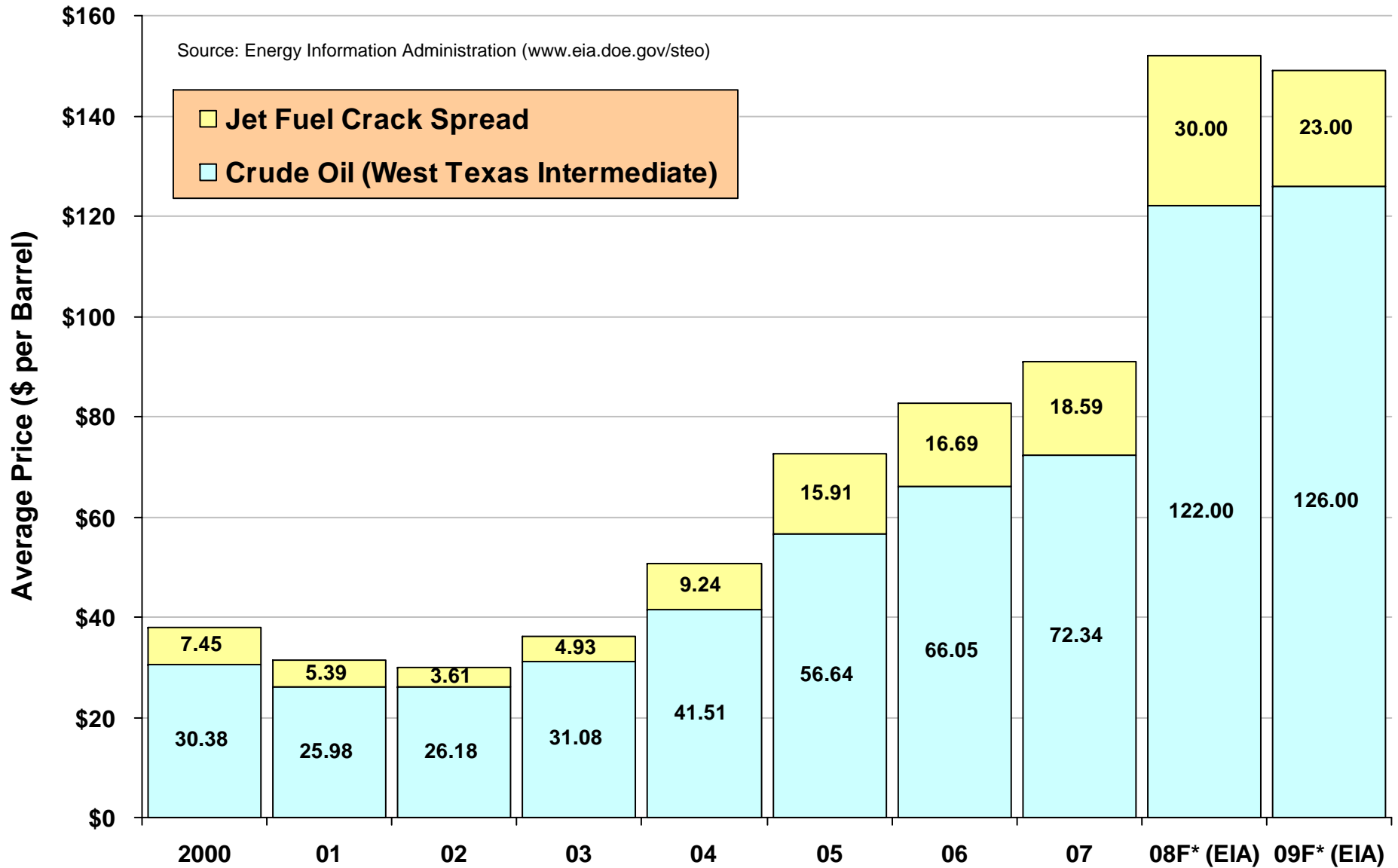
<u>U.S. Airline</u>	<u>Last Day Ops</u>
MAXjet	25-Dec-07
Big Sky	7-Jan-08
Aloha	31-Mar-08
ATA	2-Apr-08
Skybus	5-Apr-08
Eos	27-Apr-08
Champion	31-May-08
Air Midwest	30-Jun-08

<u>U.S. Airline</u>	<u>Ch. 11 Filing</u>
Frontier	11-Apr-08

\* Oasis Hong Kong Airlines and Silverjet are among the non-U.S. airlines that have ceased operations

Source: <http://www.airlines.org/economics/specialtopics/USAirlineBankruptcies.htm>

# Jet Fuel Soaring Again in 2008 – and 2009?



# The Word on the Street

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**“Fuel expense...now represents approximately 40% of total industry expense following the more than 100% rise in jet fuel prices since early 2007. As a result, the impact of even a small price rise in WTI oil prices such as 2%-3% is material to the industry’s bottom-line. For example, a 3% daily rise in oil prices is enough to wipe-out an entire year’s profit... Furthermore, ...there seems to be an endless supply of reasons why oil prices should go higher for the foreseeable future.”**

**“The industry can attempt to pass on its higher fuel costs in the form of multiple fare increases, but given the elasticity of demand, only so much can be done without substantially reducing domestic capacity. We continue to believe that there is likely to be another large cut to domestic capacity in 2H 2008 if the industry does not see any relief from record high fuel prices.”**

**“Energy price rise poses material risk,” Merrill Lynch Equity Research (May 8, 2008)**

## The Word on the Street (Cont'd)

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**“We expect carriers to explore any and all options...to bolster their positions financially and strategically in this quickly deteriorating environment. But in a world of sustained \$100+ oil, we are not convinced these actions can...offset the challenges that lie ahead. [W]ith a lukewarm economy (at best) and with carriers lapping more difficult unit revenue comps in 2H08, we foresee steep losses and cash drain continuing.”** (Goldman Sachs, May 6, 2008)

**“Should current fuel prices persist, the impact on industry profitability is expected to rival – if not exceed – that of the 9/11 terrorist attacks.... While it may sound callous to frame fuel’s rapid ascent against the far greater tragedy of 9/11, the math is indisputable – at current fuel prices, a similar attack on the industry's profitability appears underway....”** (J.P. Morgan, Apr. 15, 2008)

**“Frankly, we do not believe that the U.S. airline industry can withstand \$100+/bbl oil prices without major structural change and as long as the industry remains highly fragmented, sustainable profitability will remain an elusive goal.”** (Merrill Lynch Airline Research, Mar. 7, 2008)

## The Word on the Street (Cont'd)

**“The rapid increase in jet fuel prices will add substantially to airline costs at a time when a weakening U.S. economy will make it more difficult to offset those costs with higher fares.”**

**“The U.S. airlines...have a relatively low proportion of their 2008 fuel needs hedged, because hedging high and volatile fuel prices is expensive and may require posting cash collateral.”**

**“U.S. airlines have built up their cash...liquidity over the past several years...as a cushion against adverse conditions. Unfortunately, most of them have at least part of their short-term investments in currently illiquid auction-rate securities... Thus, the airline liquidity outlook, while adequate in the near term, could come under pressure in a prolonged...deterioration in...airline industry conditions.”**

**“High Fuel Prices Prompt Review of U.S. Airline Rating Outlooks,” S&P (Mar. 11, 2008)**



## The Word on the Street (Cont'd)

**“Standard & Poor's Ratings Services said today that it placed its ratings on nine U.S. airlines on CreditWatch with negative implications, citing the potential severe financial damage from unprecedented high jet fuel prices. ‘The dramatic increase in jet fuel prices has increased airline costs significantly over the past two months, and, if sustained, could threaten their liquidity and financial profiles. Although airlines will seek to recover the higher costs through additional fare hikes and higher fees, we believe that this will prove increasingly difficult in a weak U.S. economy.’”**

Philip Baggaley, “Ratings On U.S. Airlines Placed On CreditWatch Negative” (May 22, 2008)

**“Airlines have no choice but to pass on the cost of fuel to consumers and when passengers do begin to push back in significant numbers the airlines have no choice but slash capacity.”**

Rick Seaney, FareCompare.com, in Wall Street Journal (May 23, 2008)

## The Word on the Street (Cont'd)

**“There may now be upwards of \$25-\$30 of speculation in the price of crude, which continue to soar despite growing stockpiles in the U.S... Traditionally, refiners made more profits...making gasoline. This, too, has changed. Sharply rising pump prices have started to eat...into domestic demand... Still, most participants seem gripped by a psychology, right now, that they must be in the oil market. This sort of herd mentality usually is adopted as a trend ages, and this one has been going on for quite a while... Sellers will not appear in any kind of meaningful way, even though there is near unanimous agreement that prices do not reflect underlying fundamentals, until there is indisputable evidence of structural economic changes: demand patterns are irrevocably altered, a commercially viable alternative is found or the global economy starts to come apart. Until then, there seems to be no stopping oil's upward thrust.”**

**“We're in Shipped Shape,” MF Global Energy Risk Management Group (May 9, 2008)**

## The Word on the Street (Cont'd)

**“Demand from China and India, the falling dollar making oil an inflation hedge, speculation, OPEC supply restraints, supply threats in Iran, Iraq and Nigeria and refinery bottlenecks in the U.S... [W]e are now in unexplored territory... Now just this morning, Goldman Sachs has revised their ‘super-spike’ scenario to \$150-\$200. It can not be viewed as any kind economic prescience to say that if it comes to pass, it will have an overwhelmingly negative effect on the global economy. These...tocsins were sounded at \$30, and \$50 and \$100. Now that these milestones have quietly passed, there seems to be very little to prevent even higher prices, particularly with so much blame being assigned and no substantive solutions being proposed.”**

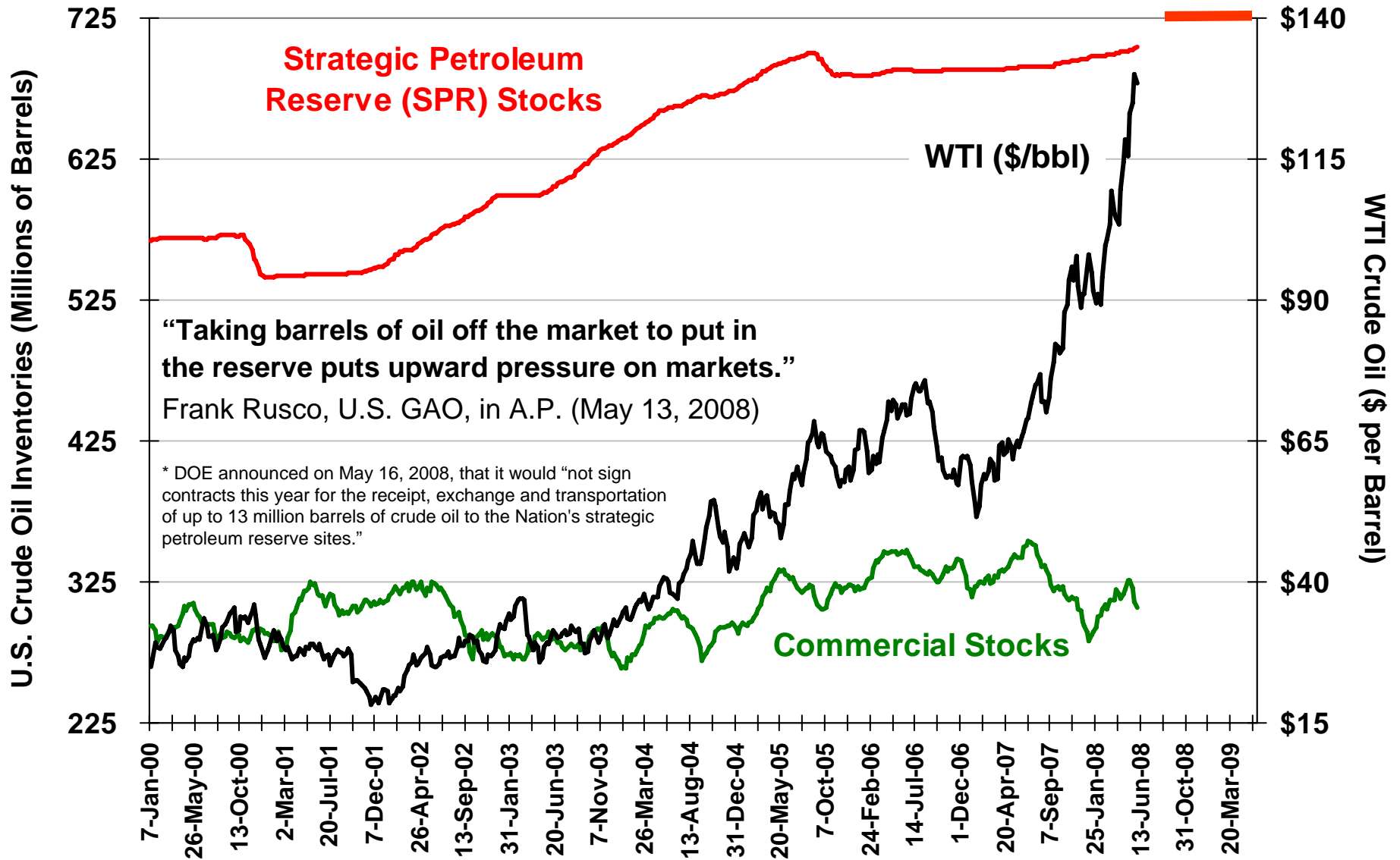
**“Rome is Burning, Lots of Fiddling,” MF Global Inc. (May 6, 2008)**

**“[W]e believe oil market fundamentals remain tight. Continuing demand growth in the non-OECD countries combined with the oil supply slowdown in the OECD and former Soviet Union are placing OPEC in a powerful position.”**

**Deutsche Bank Commodities Weekly (May 2, 2008)**

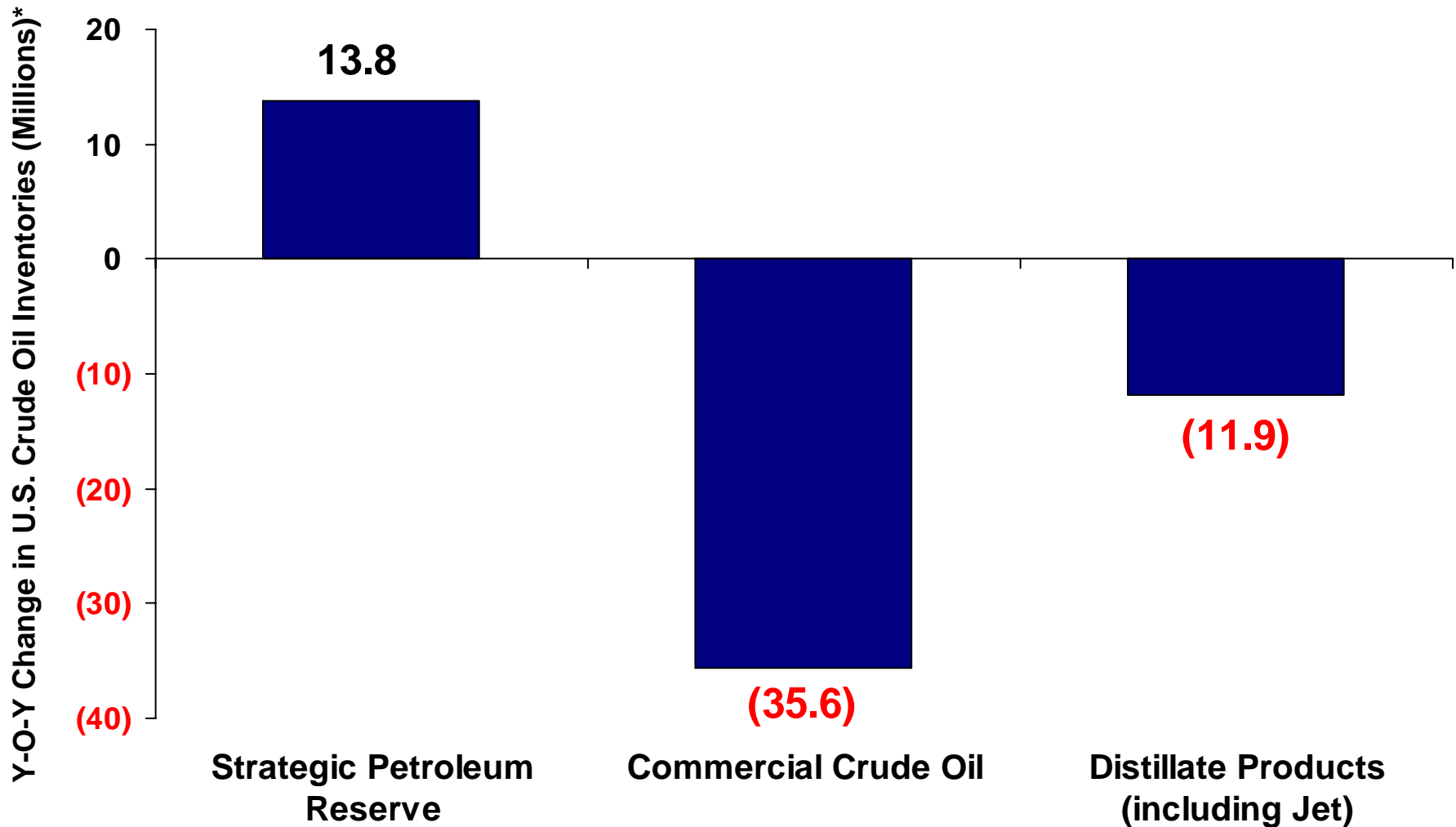
# DOE Filling SPR Until 6/30\* at Substantial Economic Cost

Exacerbating Market Tightness, Diverting Sweet Crude Oil From Commercial Stocks



Sources: <http://tonto.eia.doe.gov/oog/ftparea/wogirs/xls/psw03.xls> and [http://tonto.eia.doe.gov/dnav/pet/pet\\_pri\\_spt\\_s1\\_w.htm](http://tonto.eia.doe.gov/dnav/pet/pet_pri_spt_s1_w.htm)

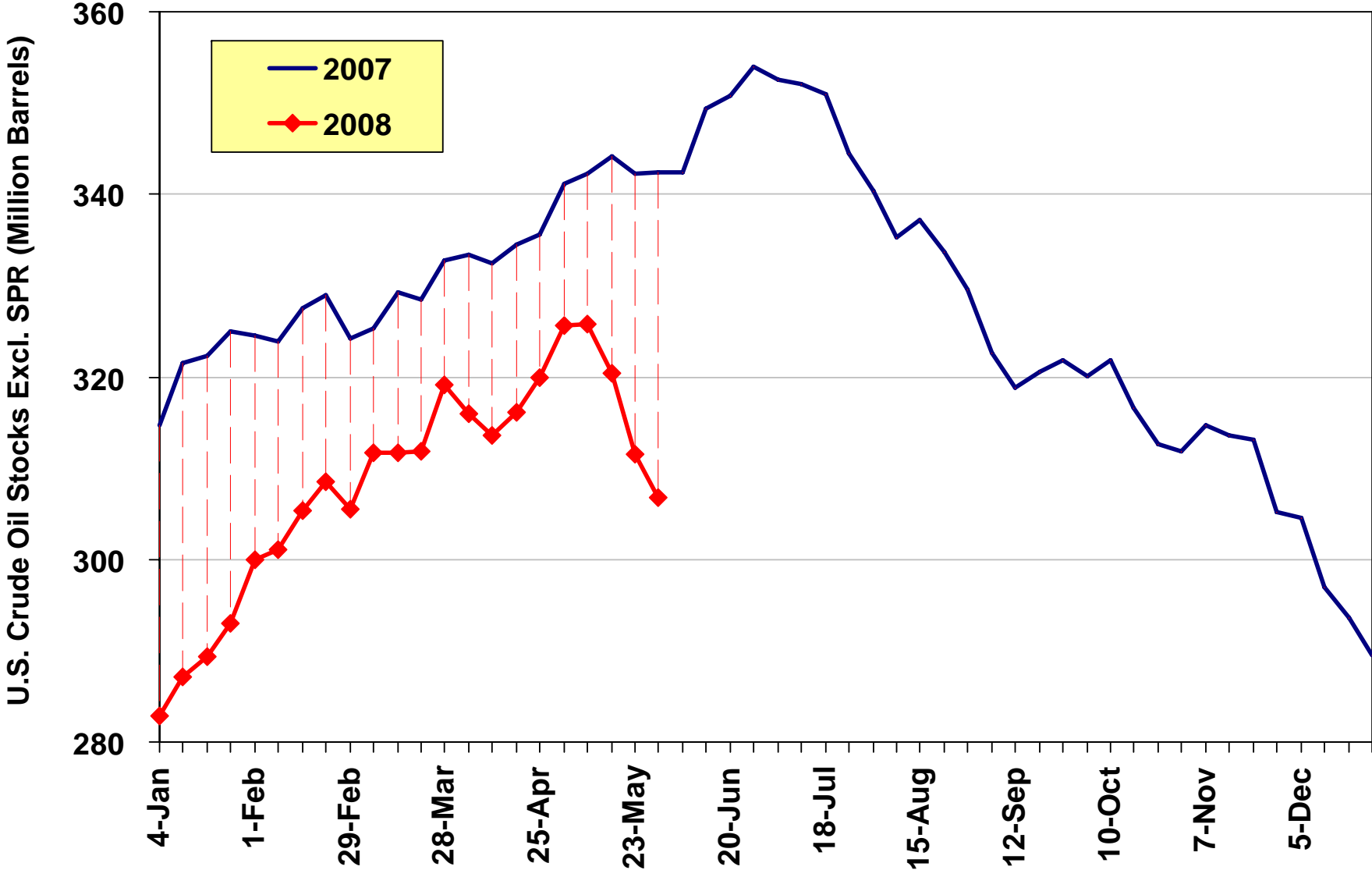
# Year-Over-Year, U.S. Commercial Petroleum Inventories Have Fallen, While SPR Stocks Have Grown



\* Comparison of stocks between week ended May 30, 2008 and week ended June 1, 2007

Source: Energy Information Administration (<http://tonto.eia.doe.gov/oog/ftparea/wogirs/xls/psw03.xls>)

# 2008 U.S. Crude Oil Stocks Have Consistently Trailed 2007



Source: Energy Information Administration Weekly Petroleum Status Report

# Irrational Exuberance?

**“Irrational exuberance is the psychological basis of a speculative bubble. I define a speculative bubble as a situation in which the news of price increases spurs investor enthusiasm, which spreads by psychological contagion from person to person, in the process amplifying stories that might justify the price increases and bringing in a larger and larger class of investor, who, despite doubts about the real value of an investment, are drawn to it partly through envy of others’ successes and partly through a gambler’s excitement.”**

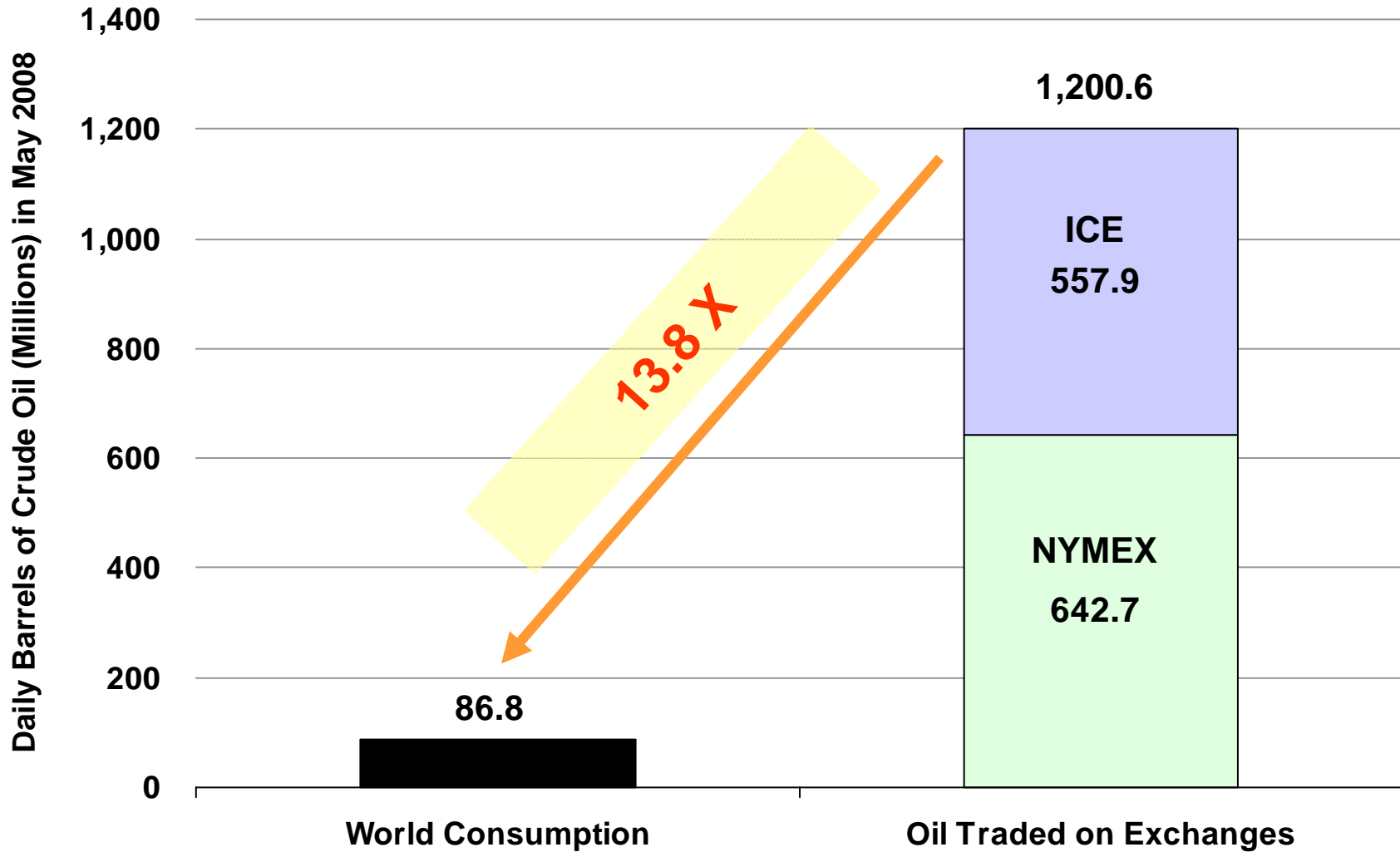
Robert J. Shiller, *Irrational Exuberance*, Second Edition, 2005, p. 2

**“The increasing prevalence of futures contracts has transformed the nature of oil markets. It is no longer only about the value of oil as an energy commodity, but also... oil as a financial asset.”**

Goldman Sachs, “Energy Roundup: Oil Bulls Take Charge,” Oct. 19, 2007

# Investors Playing Enormous Role in Crude Oil Markets

In May 2008, Paper Market Was 13.8 Times Size of Physical Market



Sources: Citi Futures Perspective, International Energy Agency, New York Mercantile Exchange (NYMEX) and London IntercontinentalExchange® (ICE)



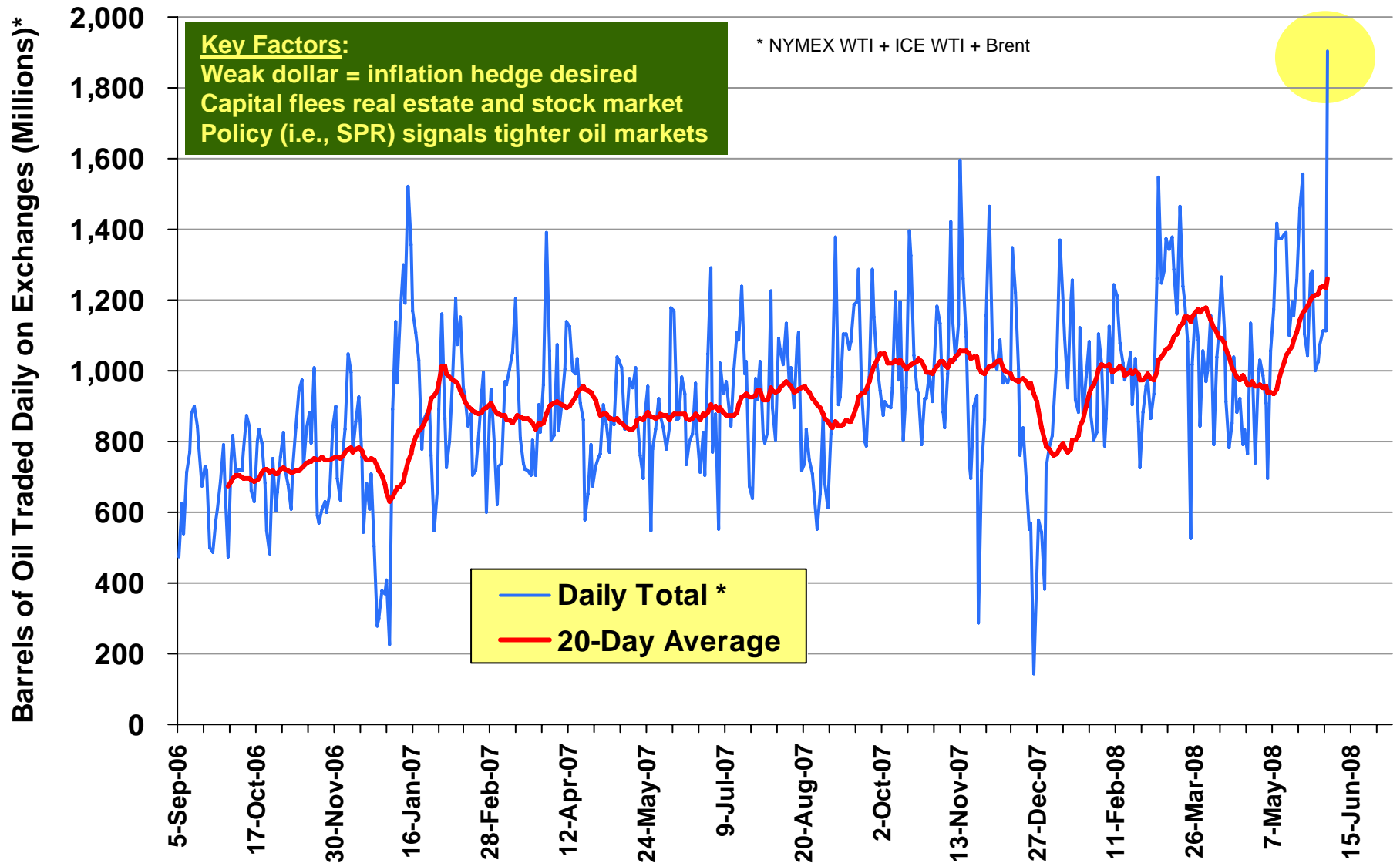
# “Oil Dot-com”

**“[T]he size of the new flows makes a difference... Our study indicated that for every \$100 million in new inflows, WTI prices increase by 1.6%... Our conclusion from this study is that we are seeing the classic ingredients of an asset bubble. Financial investors tend to ‘herd’ and chase past performance, comforted by the growing analytical conclusion that markets are tightening, and new inflows, in turn, drive prices higher. Larger allocations by institutional investors, including new sovereign wealth funds desiring to increase their commodity exposure, play a role. So does uncertainty about the true state of market fundamentals, including the level of Saudi spare capacity, the level of Chinese ‘real demand’ versus stockpiling, and other factors that buttress the current bullish consensus.”**

**“Oil Dot-com,” Lehman Brothers Energy Special Report (May 29, 2008)**

# Investors Playing Increasing Role in Crude Oil Markets

Composite Crude Oil Volume\* Set New Record of 1,906,016 Contracts on June 6



Sources: Citi Futures Perspective and IEA, from New York Mercantile Exchange (NYMEX) and London IntercontinentalExchange® (ICE)

# **“The Daze of Our Lives”**

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**“Friday will live in the memory of participants for a long time. The task now is trying to determine why and how it happened and what will happen next. There is probably nowhere in the five-year history of the current rally with a comparable move that is not associated with an event of some import. A comment by a senior Israeli minister is not an event. The introduction of military forces into southern Lebanon two summers ago was an event. Obviously, speculative interests were returning to the market... While there is little doubt of the speculative value of a strategically vital commodity like oil, it can easily become overvalued from time to time. We think this is such a time.”**

**“The Daze of Our Lives,” MF Global Energy Overview (June 9, 2008)**

# The Running of the Bulls

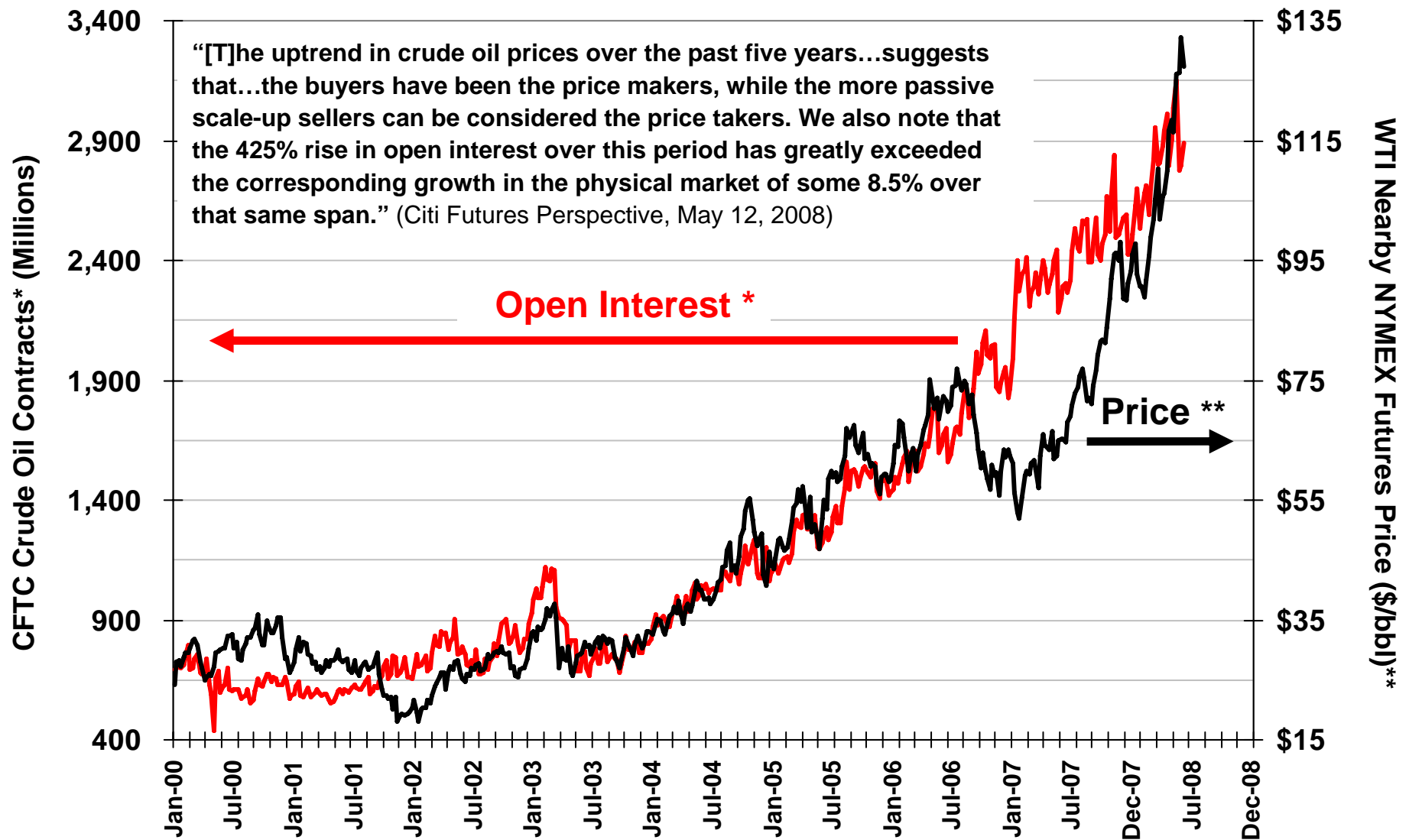
**“So if demand growth is faltering and supply is rising, just as economics would predict should occur in the face of rising prices, just why are prices remaining so persistently strong? Partly, we believe it is because of a highly successful marketing campaign on the part of the bulls that has succeeded in getting many market participants to accept and repeat fundamental statements that sound bullish but are not necessarily factually true. We hear, “the dollar is weak,” “demand is robust,” “consumers won’t change,” “supply is disappointing,” “oil production is at a peak,” over and over again when the data suggests otherwise. We also note quite simply that there has been a long-term trending flow of buying into this market that has greatly expanded open interest and trading volume.**

**We hear complaints around the marketplace about how some of us just won’t see reason and give up this talk of speculation or a market bubble, but during the price even higher is not exactly convincing us that the price is fundamentally justified. On the contrary, we only see higher prices as undermining the fundamentals that much more, making it that more difficult to pin the record prices on a fundamental cause.”**

**Tim Evans, Citi Futures Perspective, PM Energy News & Views (June 5, 2008)**

# Rising Crude Oil Open Interest Closely Tracking Price

On May 13, Total Open Interest Surpassed Equivalent of 3.15 Billion Barrels



\* NYMEX futures and options combined; note that one contract equals 1,000 barrels

\*\* Friday settlement in the nearby NYMEX futures contract (<http://tonto.eia.doe.gov/dnav/pet/hist/rclc1d.htm>)

Source: Citi Futures Perspective

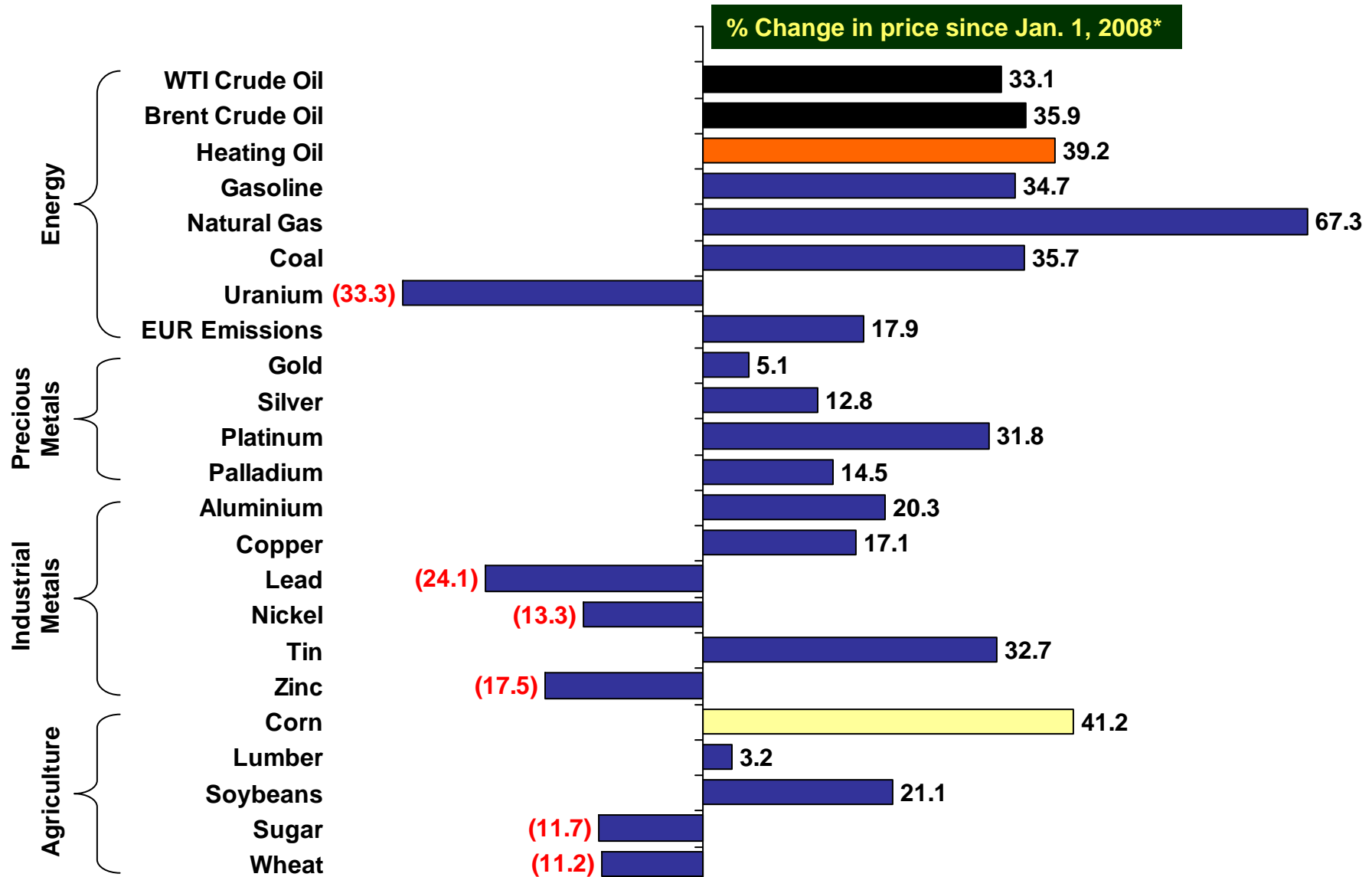
# “Bubbles in the Making”

**“[B]oth trend-following speculation and institutional commodity index buying reinforce the upward pressure on prices. Commodities have become an asset class for institutional investors and they are increasing allocations to that asset class by following an index buying strategy. Recently, spot prices have risen far above the marginal cost of production and far-out, forward contracts have risen much faster than spot prices. Price charts have taken on a parabolic shape which is characteristic of bubbles in the making. So, is this a bubble? The answer is that the bubble is super-imposed on an upward trend in oil prices that has a strong foundation in reality... To be sure a crash in the oil market is not imminent. The danger currently comes from the other direction. The rise in oil prices aggravates the prospects for a recession.”**

George Soros, Testimony before the U.S. Senate Commerce Committee Oversight Hearing on FTC Advanced Rulemaking on Oil Market Manipulation (June 3, 2008)

# Rising Commodity Prices are Widespread

Energy Policy Contributing to Rising Prices of Corn, Crude Oil, Heating Oil, Gas

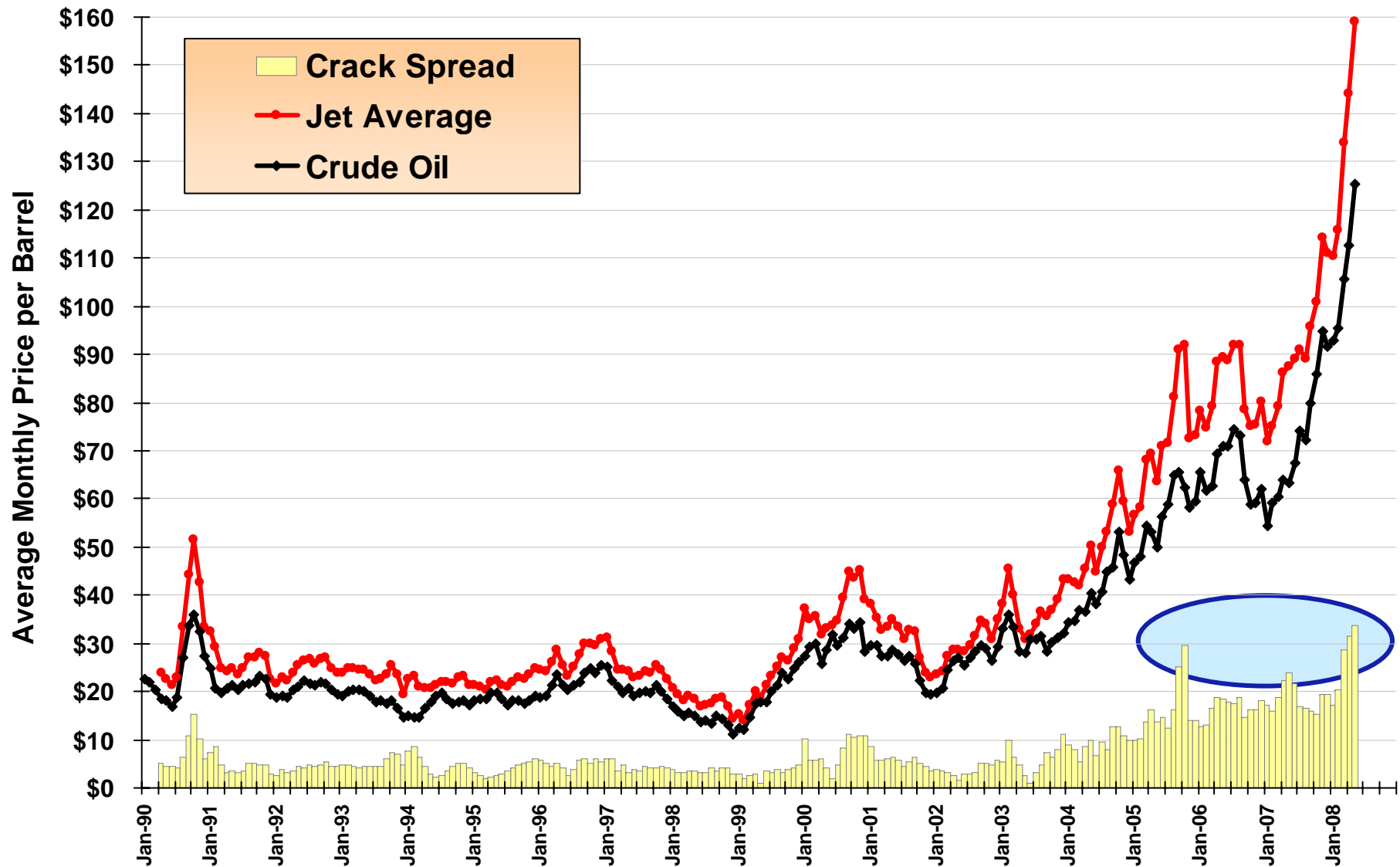


Source: Deutsche Bank Global Markets Research, Bloomberg

\* As of June 6, 2008

# Jet Fuel Prices Soaring – Only Partly on Soaring Crude

Crack Spread Has Returned to Hurricane Levels: Far Above \$5 Historical Norm

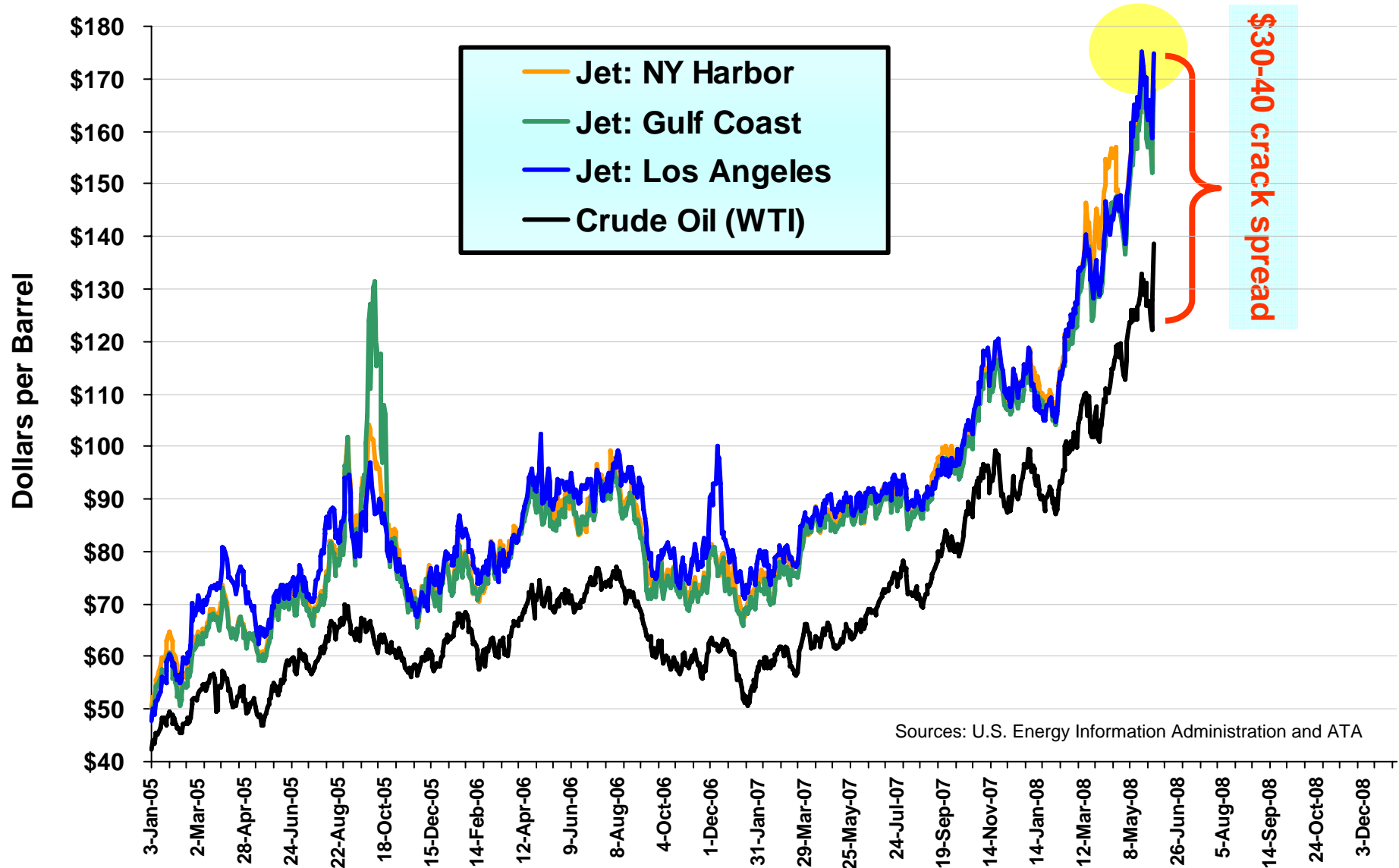


Sources: U.S. Energy Information Administration and the Air Transport Association of America



# Distillate Inventories Declining, Jet Fuel Prices Soaring

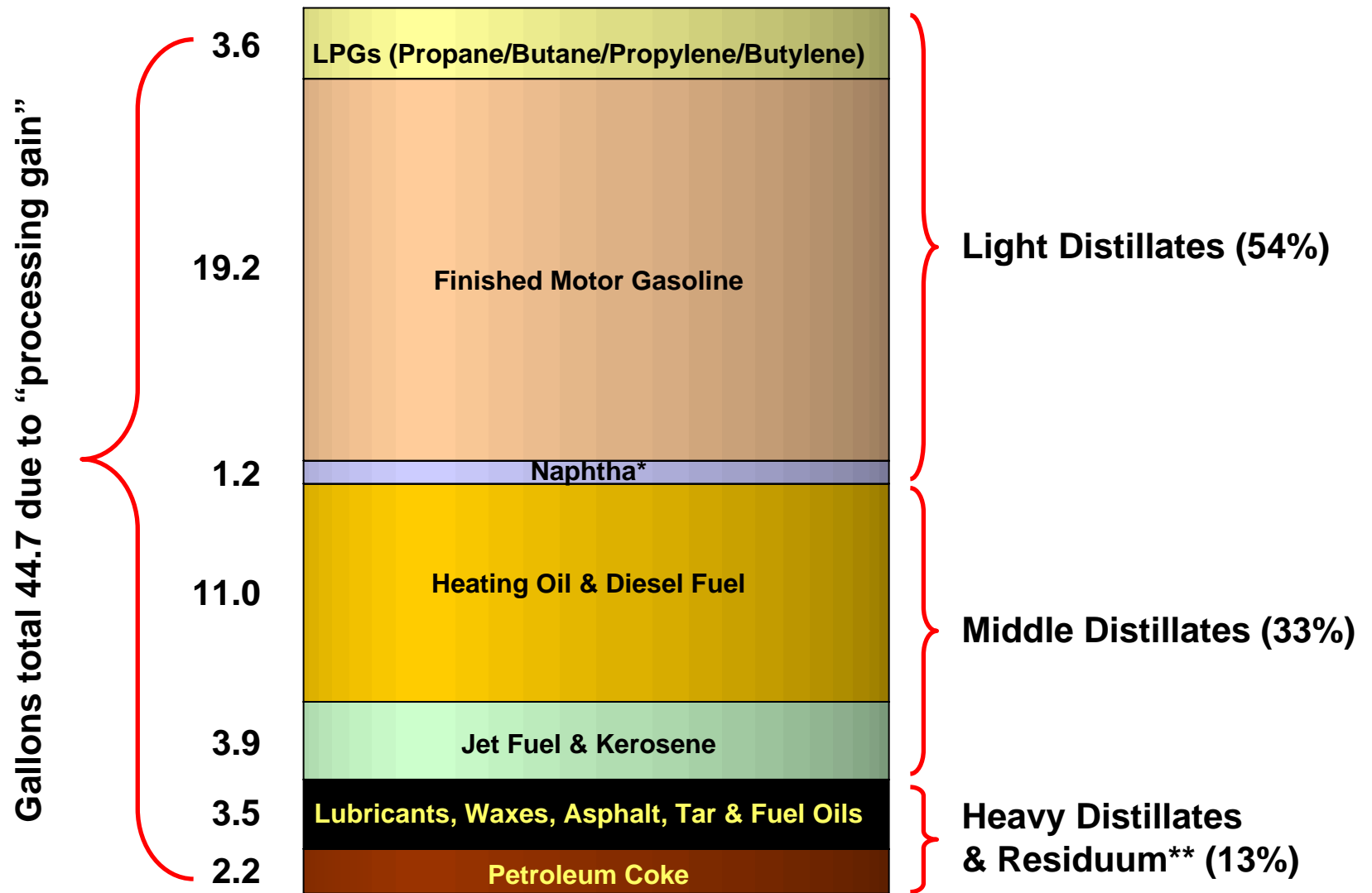
Jet Peaked at \$175.17 per Barrel in Los Angeles on May 22, 2008



Sources: U.S. Energy Information Administration and ATA

# U.S. Refineries are Configured to Maximize Gasoline Output

Typical U.S. Refinery Yield From a 42-Gallon Barrel of Crude Oil in 2007

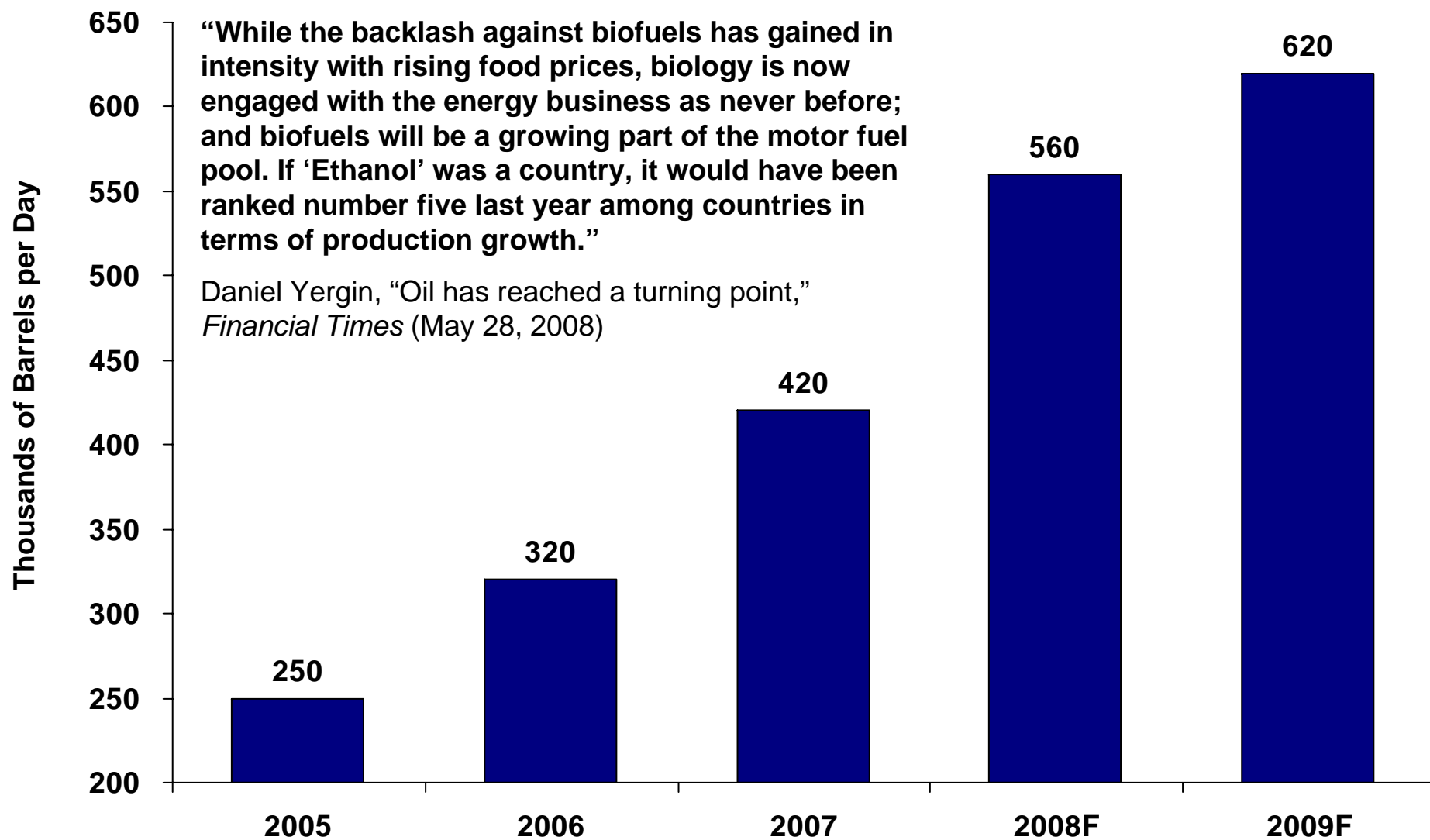


\* Feedstock for high-octane gasoline, petrochemicals and solvents

\*\* Includes heavy oils used as in industry, marine transportation, electric power generation

Source: [Energy Information Administration](#) and [American Petroleum Institute](#)

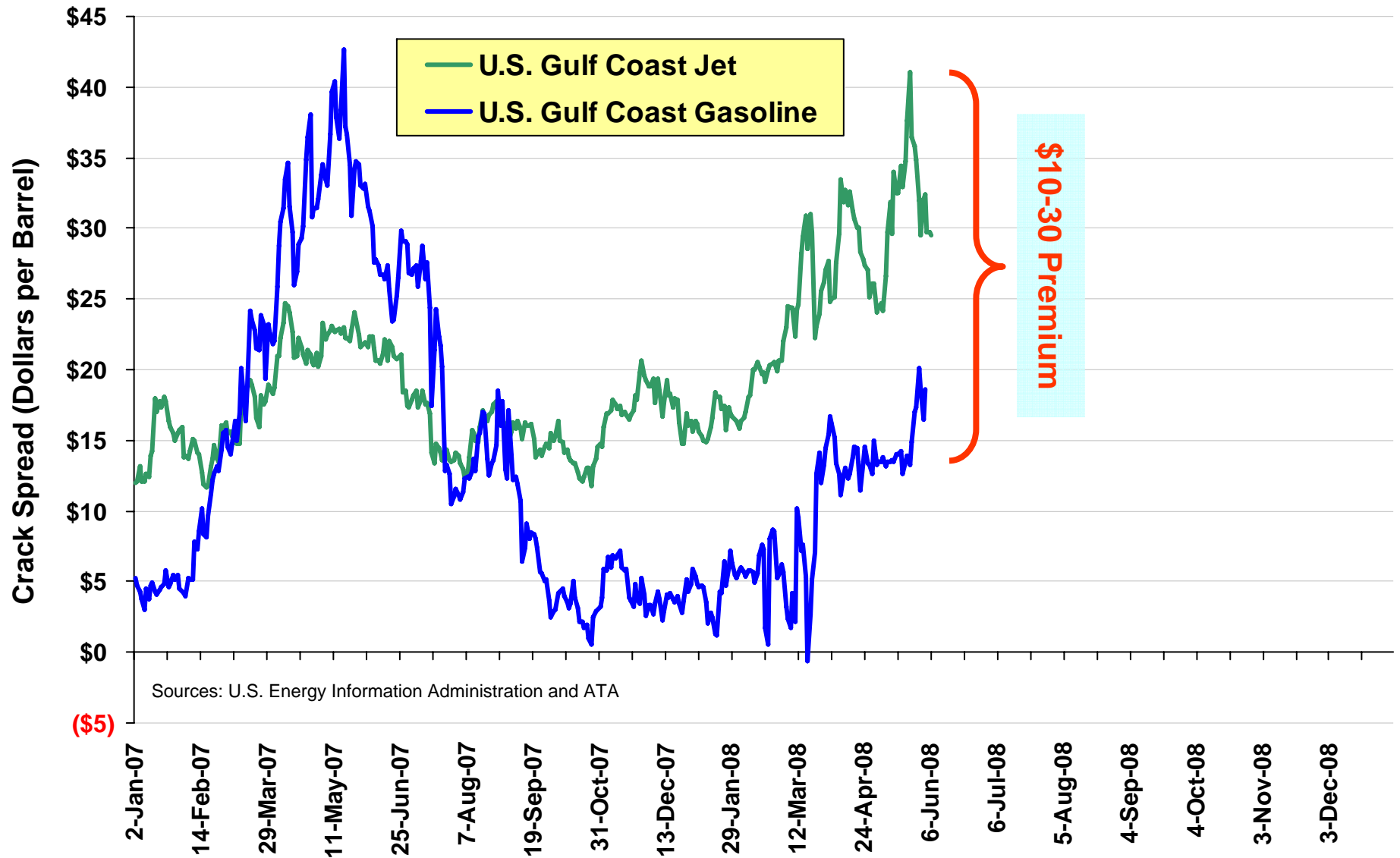
# U.S. Ethanol Production Displacing Conventional Gasoline



Source: [Energy Information Administration](#)

# Jet Fuel Premium to Gasoline Expanding Again

Differential Recently Exceeded \$20 per Barrel

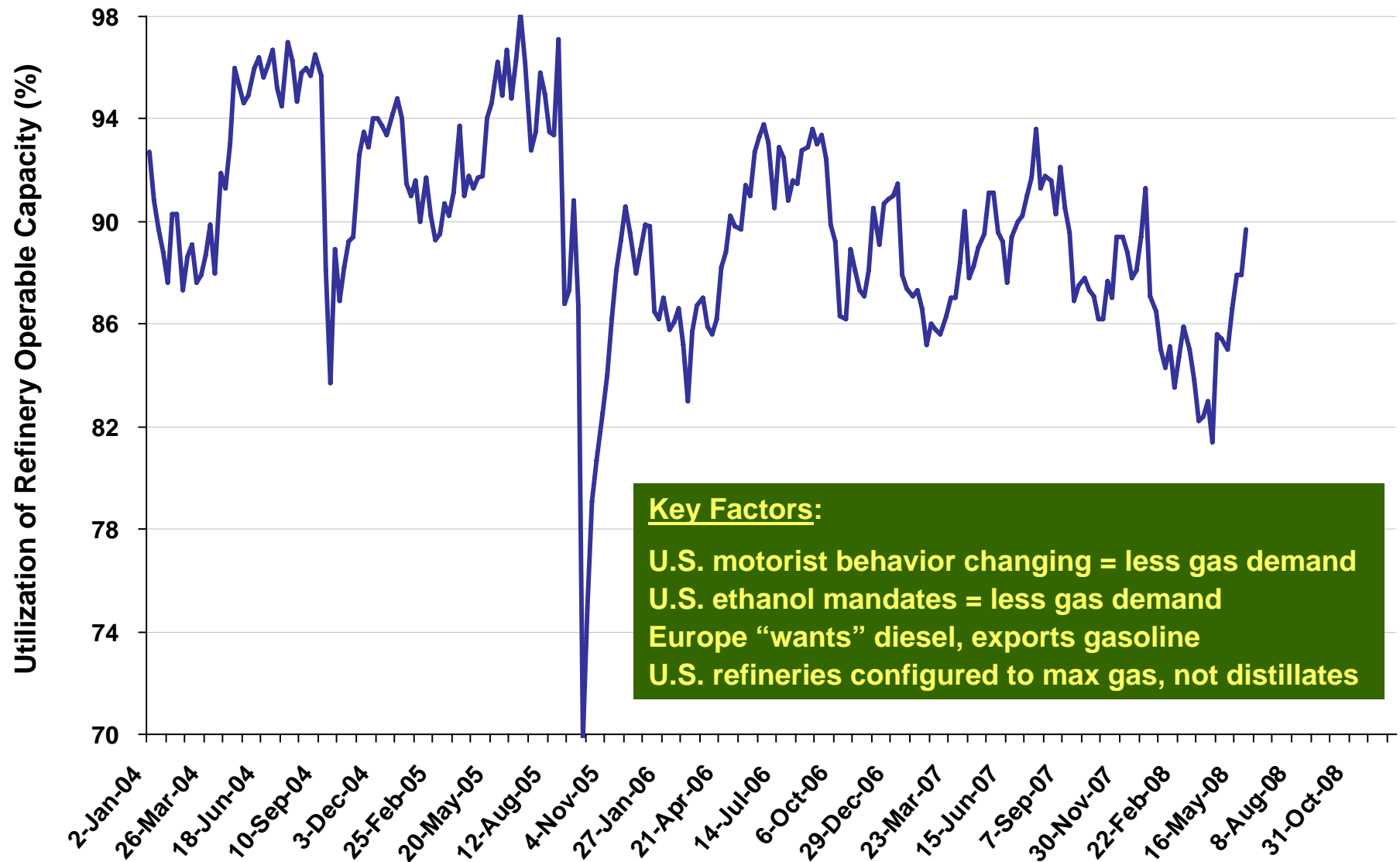


Sources: U.S. Energy Information Administration and ATA

(\$5)

# Refinery Utilization Levels Remain Below Seasonal Norms

## U.S. Refineries Have Responded to Lower Gasoline Margins



Source: [http://tonto.eia.doe.gov/dnav/pet/pet\\_pnp\\_wiup\\_dcu\\_nus\\_w.htm](http://tonto.eia.doe.gov/dnav/pet/pet_pnp_wiup_dcu_nus_w.htm)

# Releasing the N.E. Home Heating Oil Reserve Would Help Offset Substantial Depletion of U.S. Distillate Inventories



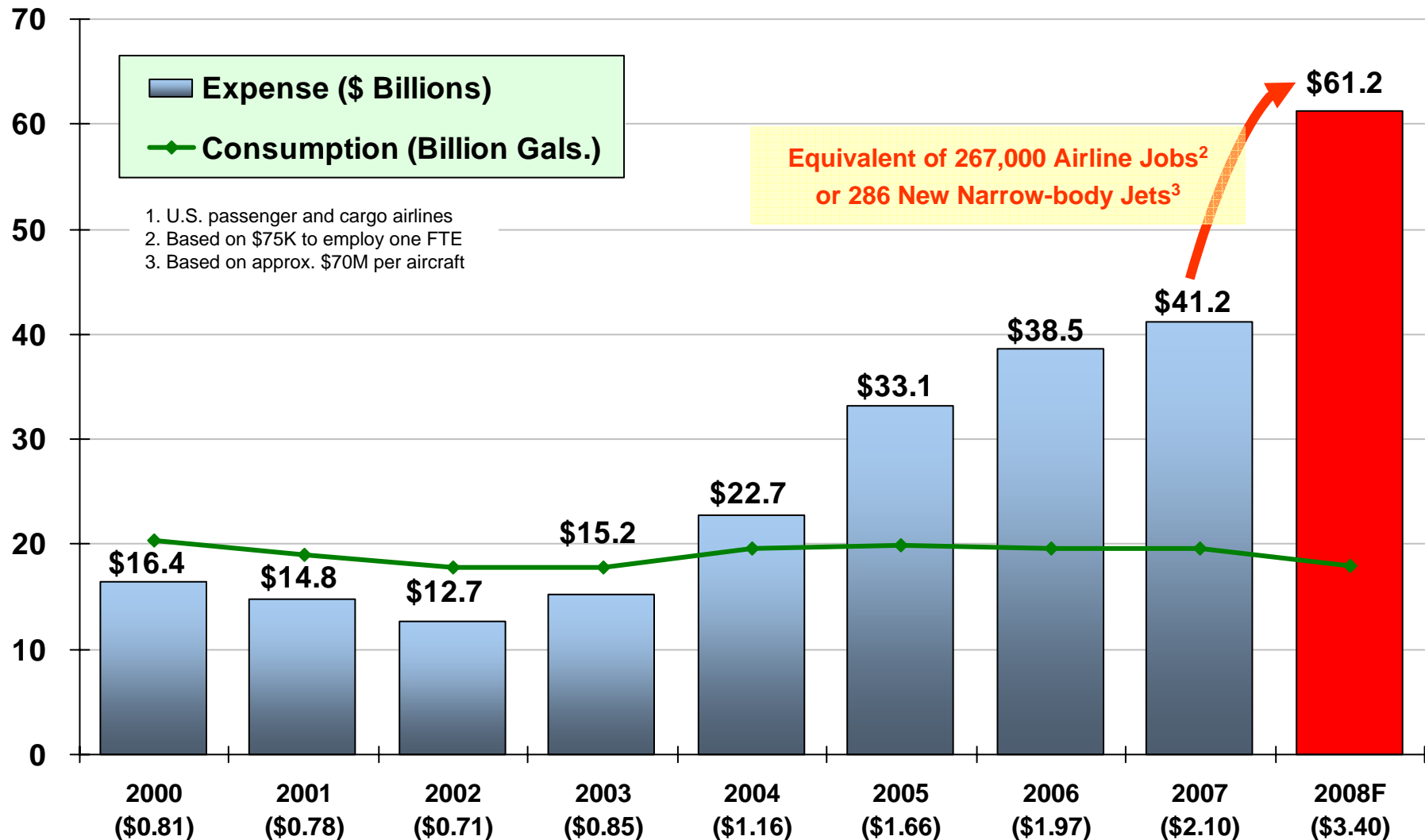
\* Comparison of stocks between week ended May 30, 2008 and week ended June 1, 2007

\*\* Diesel fuel and heating oil

Source: Energy Information Administration

# 2008 Jet Fuel Expense<sup>1</sup> Will Break 2007 Record

Total Expense (Excluding Taxes and Into-Plane Fees) Could Exceed \$60 Billion

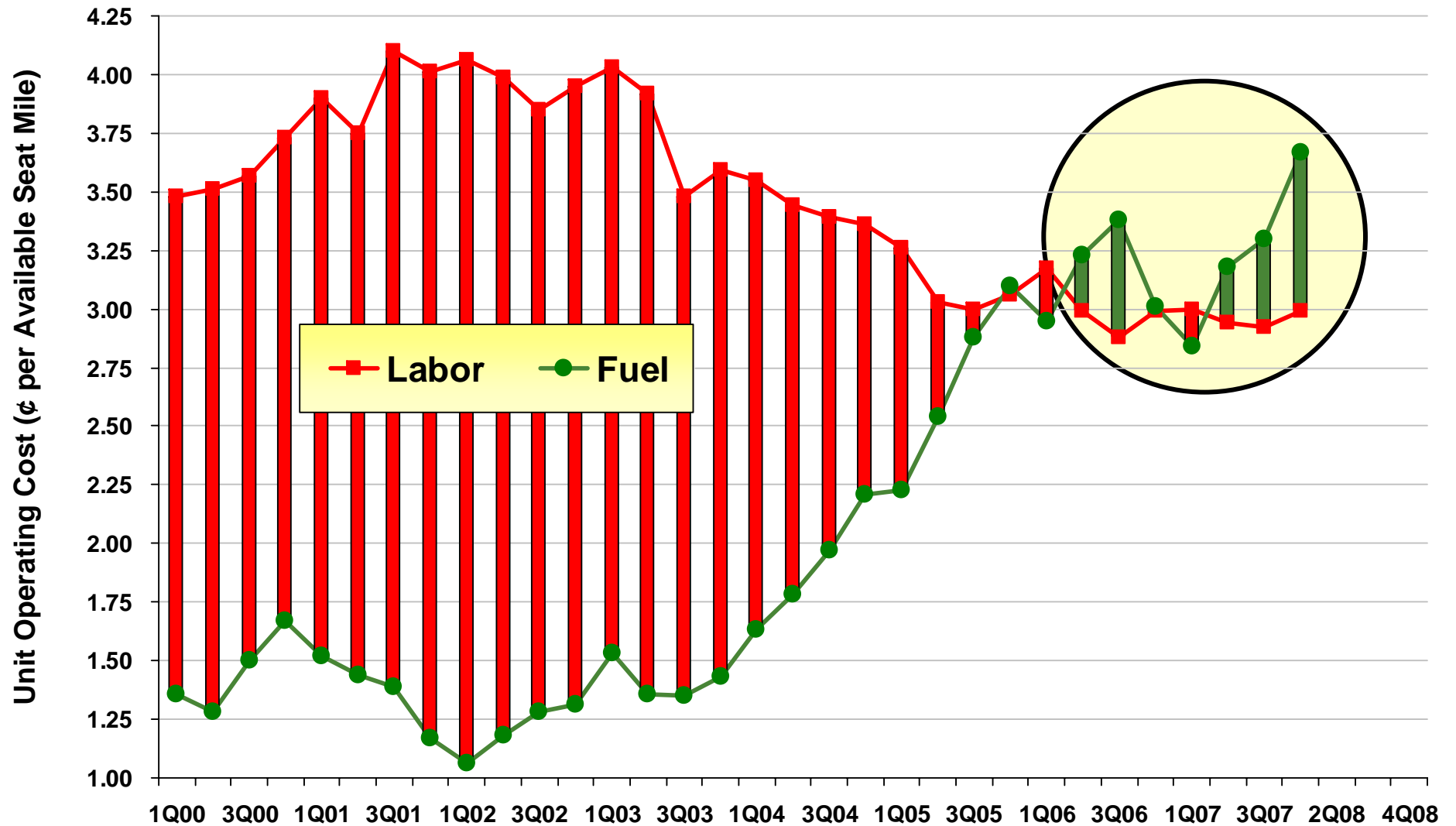


Note: Value in parentheses below year is average price paid excluding taxes, into-plane fees, pipeline tariffs and hedging costs

Sources: ATA, Energy Information Administration, Department of Transportation

# Surging Fuel Expense Offsetting Labor Restructuring

For Passenger Airlines, Fuel CASM Has Overtaken Labor CASM



Source: ATA Passenger Airline Cost Index



# Got Milk?

**“[R]aising airfares isn't like raising the price of milk at the grocery store. Consumers have almost perfect information for price comparisons – the Internet can hunt the cheapest fare worldwide in seconds. If one carrier has some empty seats to fill, it will have to cut the price because getting something for that seat is better than flying it empty. And there's lots of competition in the industry – some airlines have lower cost structures than others, or better fuel hedges, and can absorb more of the higher costs than others.”**

Scott McCartney, “As Airlines Cut Back, Who Gets Grounded?”  
*Wall Street Journal* (June 5, 2008)

# Price of Air Travel Growing Below Average Basket of Goods

Trailing College Tuition, Drugs, New Homes, New Vehicles, Gasoline and U.S. CPI

<b>Product (unit)</b>	<b>1978</b>	<b>1990</b>	<b>2007</b>	<b>Growth</b>
College Tuition—Public (yr.) <sup>1</sup>	\$688	\$1,908	\$6,185	9.0 x
College Tuition—Private (yr.) <sup>1</sup>	\$2,958	\$9,340	\$23,712	8.0 x
Prescription Drugs (index) <sup>2</sup>	61.6	181.7	369.2	6.0 x
New Single-Family Home <sup>3</sup>	\$55,700	\$122,900	\$247,900	4.5 x
New Vehicle <sup>6</sup>	\$6,470	\$15,900	\$28,800	4.5 x
Unleaded Gasoline (gallon) <sup>7</sup>	\$0.67	\$1.16	\$2.80	4.2 x
<b>CPI (all items) <sup>2</sup></b>	<b>65.2</b>	<b>130.6</b>	<b>207.3</b>	<b>3.2 x</b>
Movie Ticket <sup>8</sup>	\$2.34	\$4.22	\$6.88	2.9 x
First-Class Domestic Stamp <sup>5</sup>	\$0.15	\$0.25	\$0.42	2.8 x
Whole Milk (index) <sup>2</sup>	81.0	124.4	205.4	2.5 x
Grade-A Large Eggs (dozen) <sup>2</sup>	\$0.82	\$1.01	\$1.68	2.0 x
<b>Air Travel-<i>International</i> (mile) <sup>4</sup></b>	<b>7.49¢</b>	<b>10.83¢</b>	<b>12.44¢</b>	<b>1.7 x</b>
<b>Air Travel-<i>Domestic</i> (mile) <sup>4</sup></b>	<b>8.49¢</b>	<b>13.43¢</b>	<b>12.66¢</b>	<b>1.5 x</b>
Television (index) <sup>2</sup>	101.8	74.6	16.9	0.2 x

<sup>1</sup> The College Board (based on beginning of academic year)

<sup>2</sup> U.S. Bureau of Labor Statistics (includes hedonic "quality-change" adjustments)

<sup>3</sup> U.S. Census Bureau – [www.census.gov/const/uspriceann.pdf](http://www.census.gov/const/uspriceann.pdf) (median)

<sup>4</sup> ATA via U.S. Bureau of Transportation Statistics – [www.airlines.org](http://www.airlines.org)

<sup>5</sup> U.S. Postal Service – [www.usps.com/postalhistory/welcome.htm](http://www.usps.com/postalhistory/welcome.htm), Publication 100

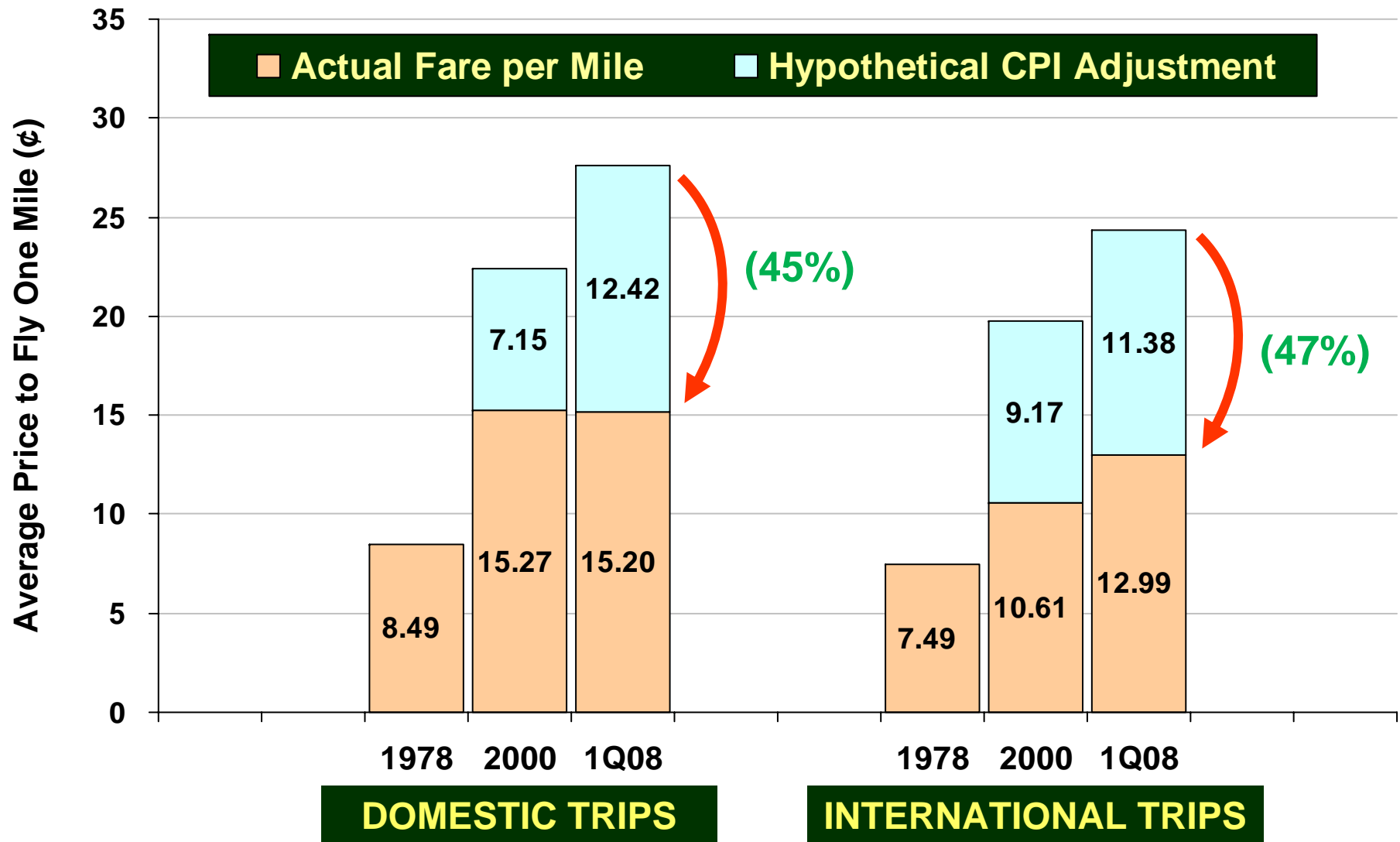
<sup>6</sup> National Automobile Dealers Association – [www.nada.org](http://www.nada.org) (avg. retail selling price)

<sup>7</sup> U.S. Department of Energy – <http://www.eia.doe.gov/emeu/mer/pdf/mer.pdf>, Table 9.4

<sup>8</sup> National Association of Theatre Owners – [www.natonline.org](http://www.natonline.org) (avg. U.S. ticket prices)

# Flying a U.S. Airline Remains a Bargain

The Price to Fly a Mile in 2008 is Substantially Below Inflation-Predicted Levels

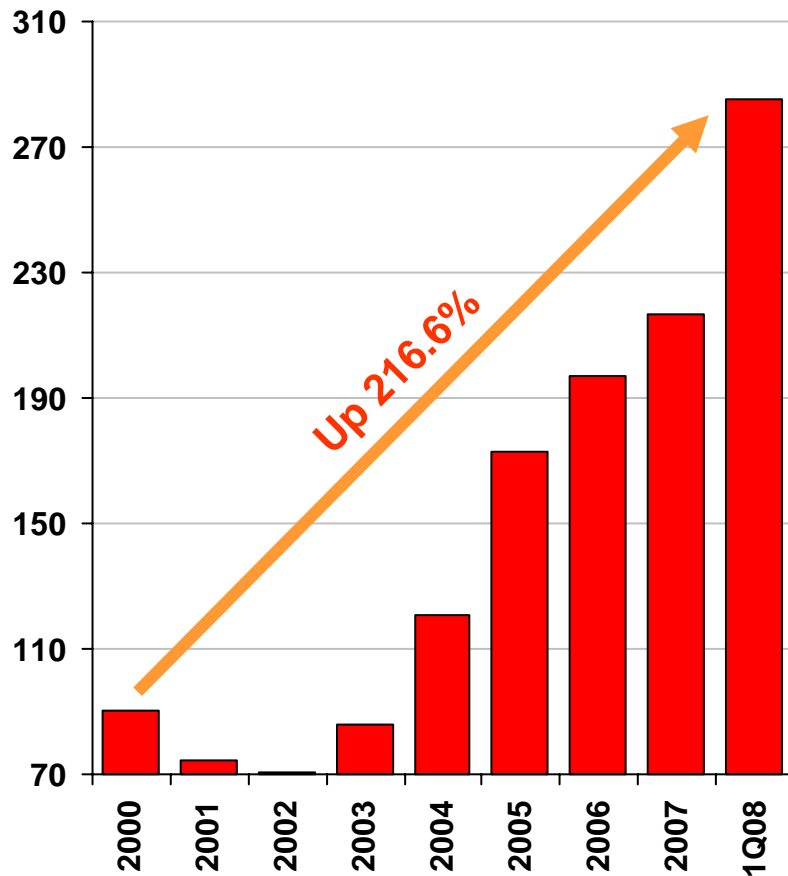


Sources: ATA analysis of data from seven airlines, the Department of Transportation and the Bureau of Labor Statistics

# From 2000 to 1Q08, Jet Fuel Prices Overwhelming Fares

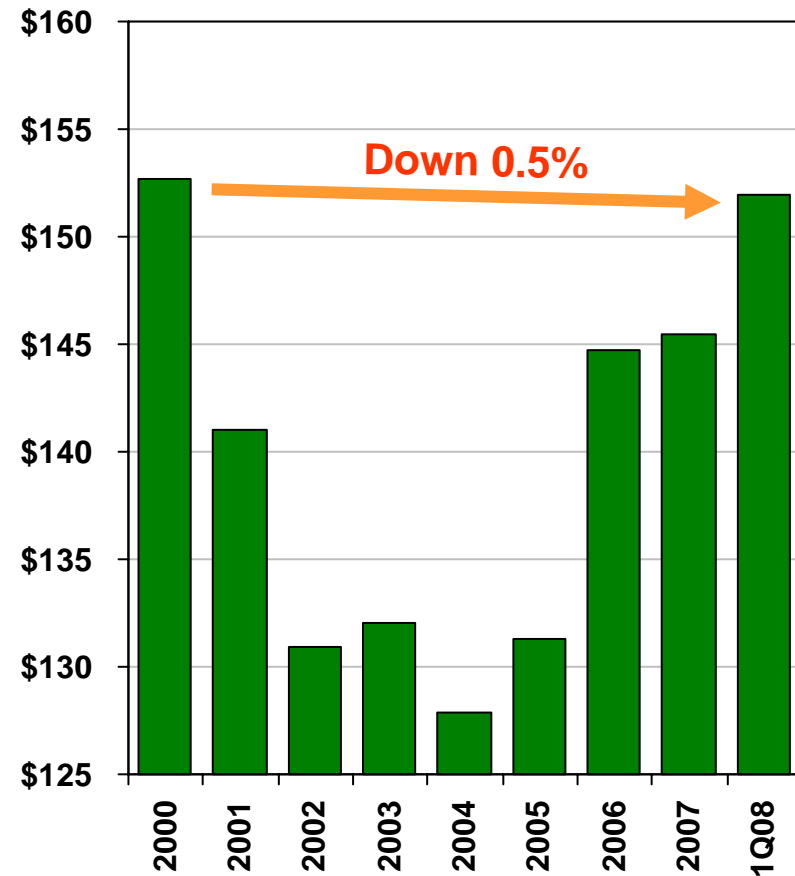
Jet Fuel Up 217%, Domestic Fares Down 0.5%

**Average U.S. Jet Fuel Price**  
(Cents per Gallon)



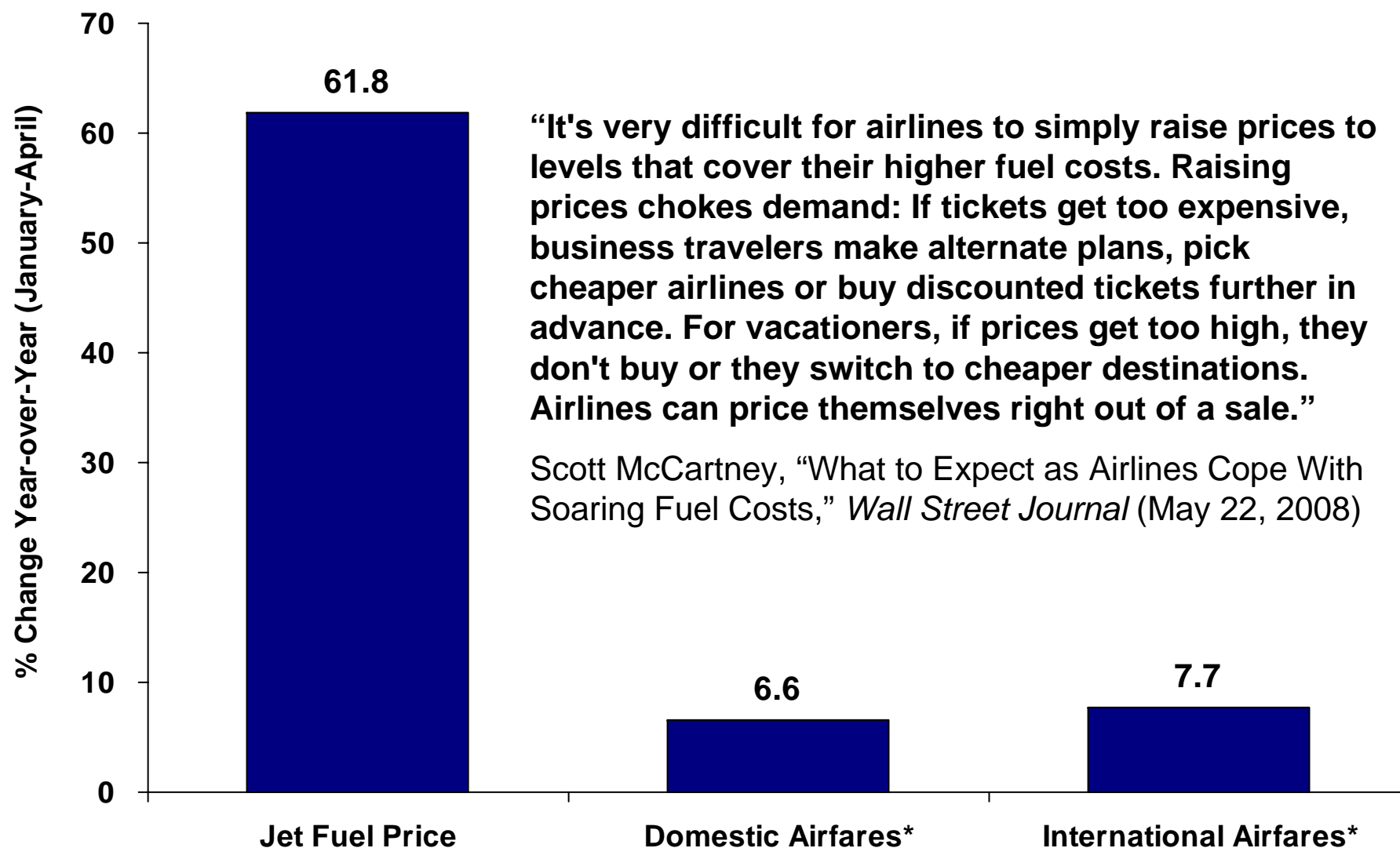
Source: U.S. Energy Information Administration

**Avg. Fare to Fly 1,000 Miles Domestically**  
(U.S. Dollars, Excluding Govt. Taxes)



Source: ATA passenger revenue report (mainline + regionals)

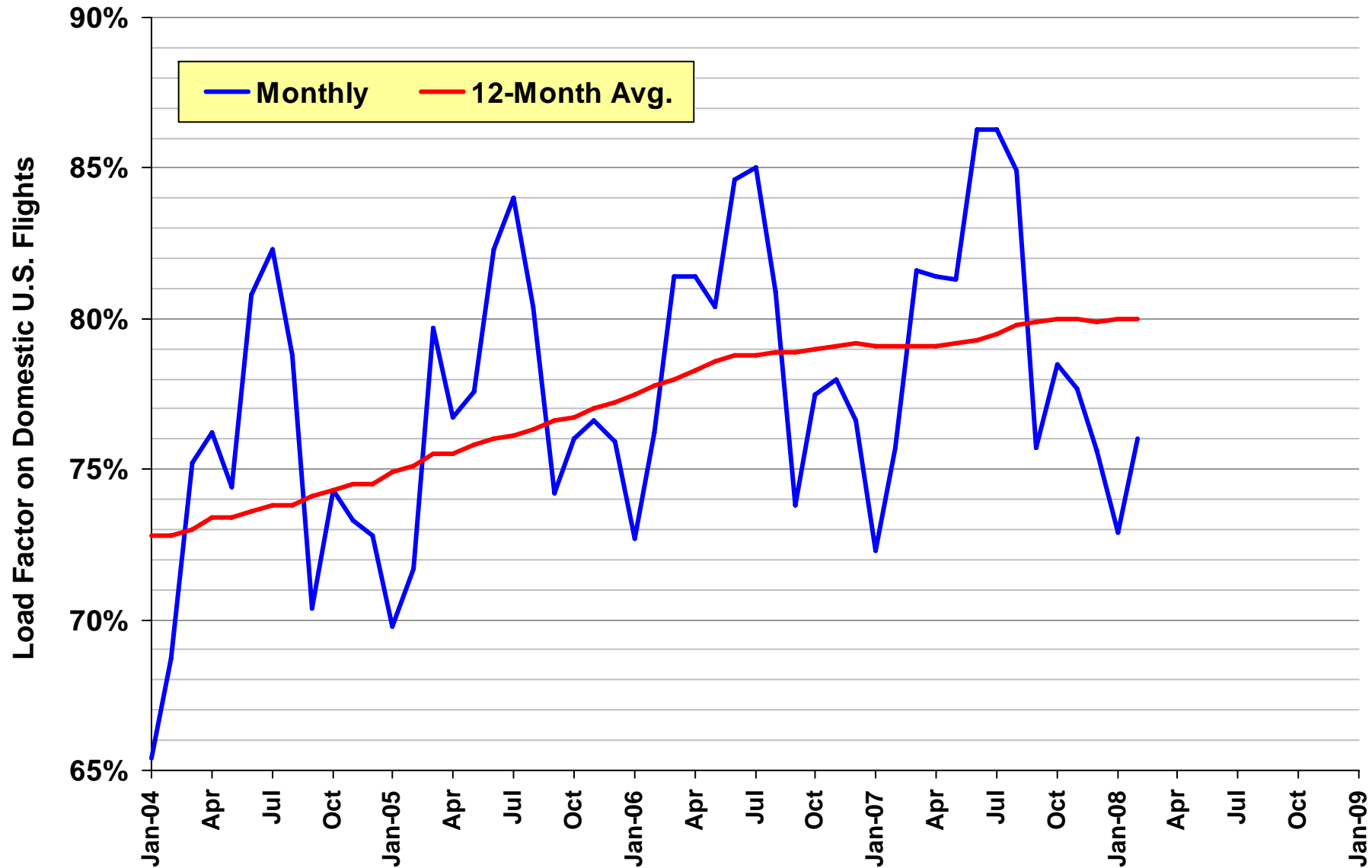
# Passenger Yield (Fares per Mile) Lagging Fuel Prices



Source: EIA and ATA passenger revenue report

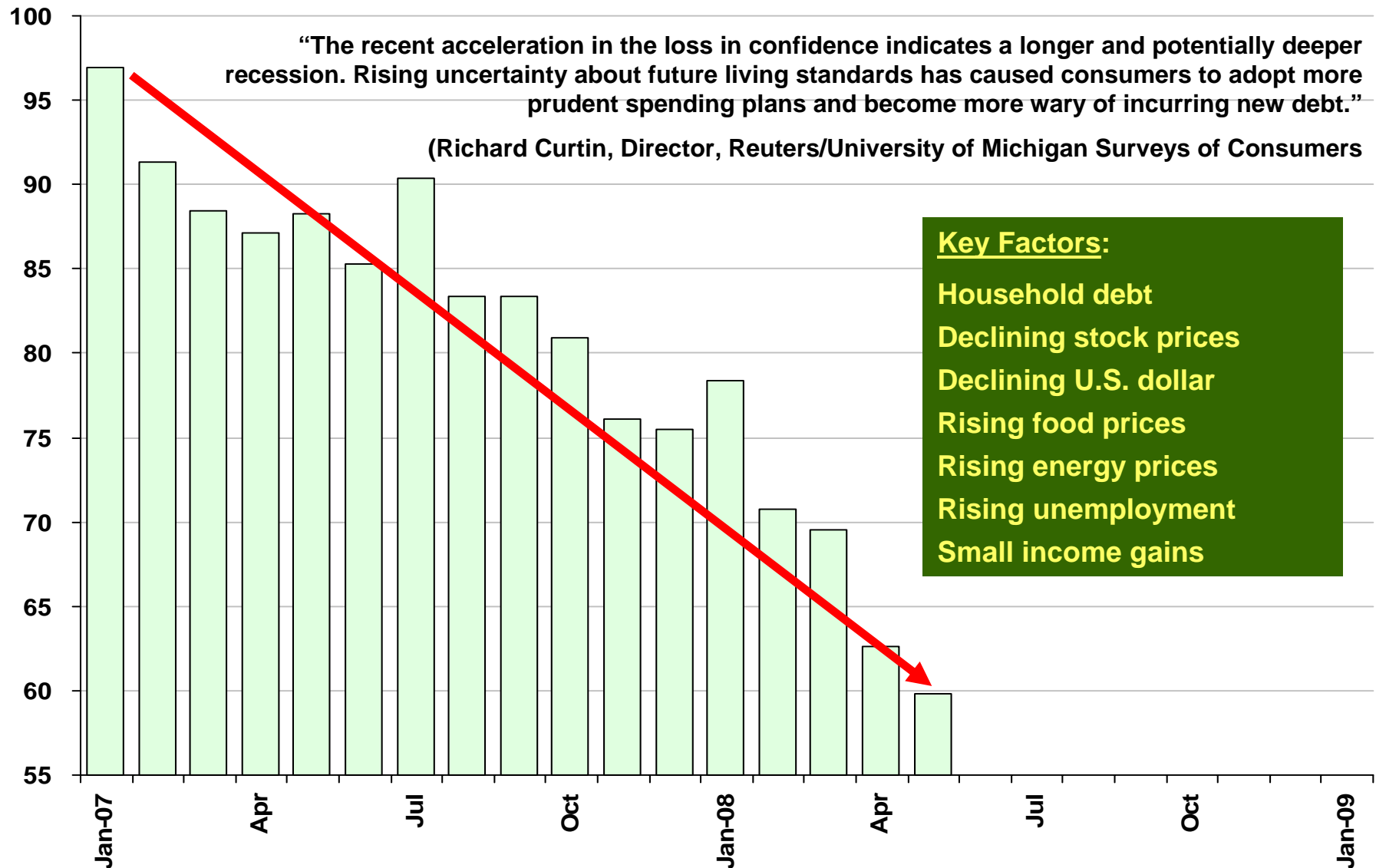
\* Fares per mile flown, also known as passenger yield

# Domestic Load Factor Stabilizing (Annually) at 80%



Source: U.S. Bureau of Transportation Statistics

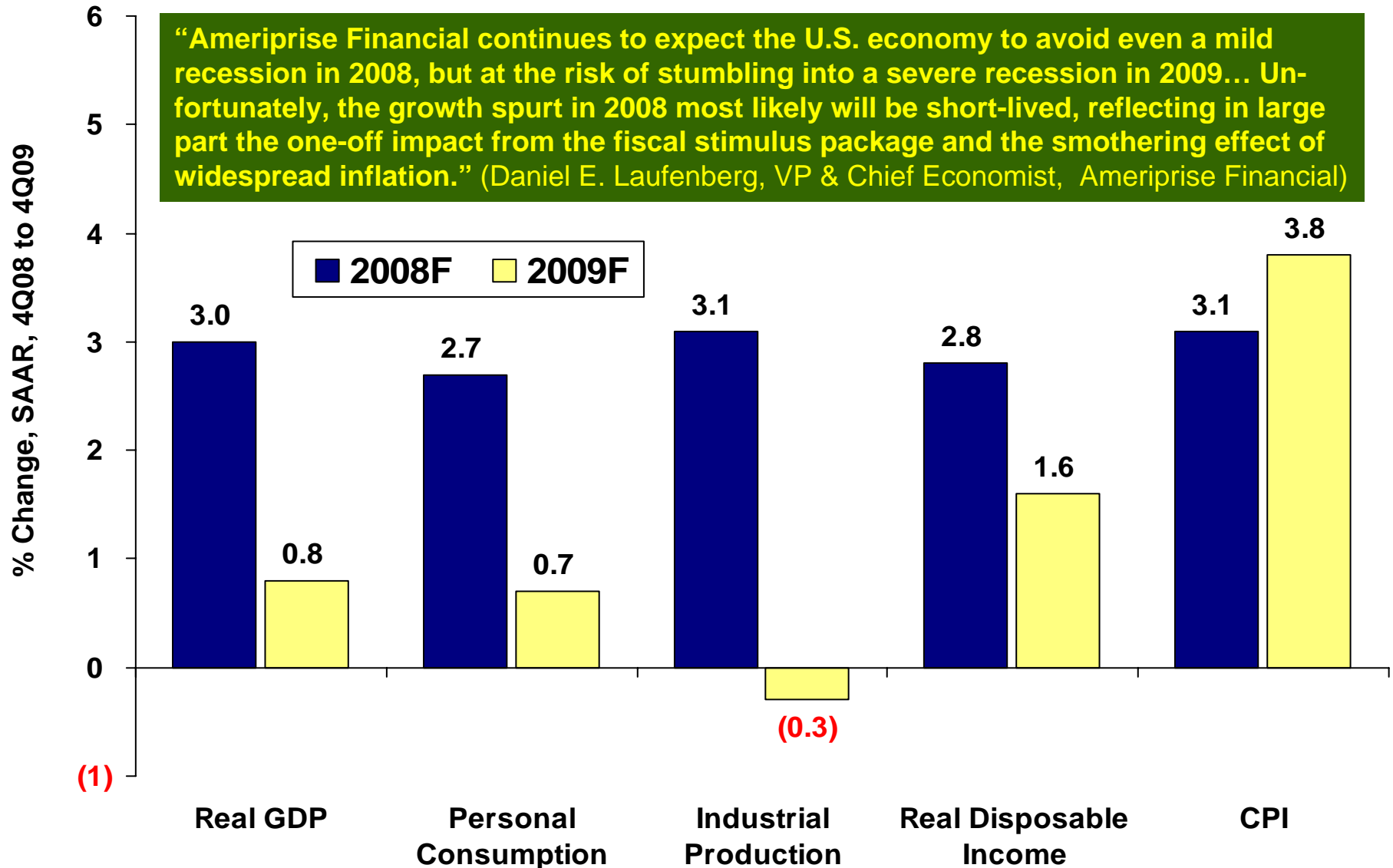
# U.S. Consumer Sentiment at Lowest Level Since June 1980



Source: University of Michigan via <https://customers.reuters.com/community/university>

# U.S. Economy Could Be Worse in 2009

“Ameriprise Financial continues to expect the U.S. economy to avoid even a mild recession in 2008, but at the risk of stumbling into a severe recession in 2009... Unfortunately, the growth spurt in 2008 most likely will be short-lived, reflecting in large part the one-off impact from the fiscal stimulus package and the smothering effect of widespread inflation.” (Daniel E. Laufenberg, VP & Chief Economist, Ameriprise Financial)

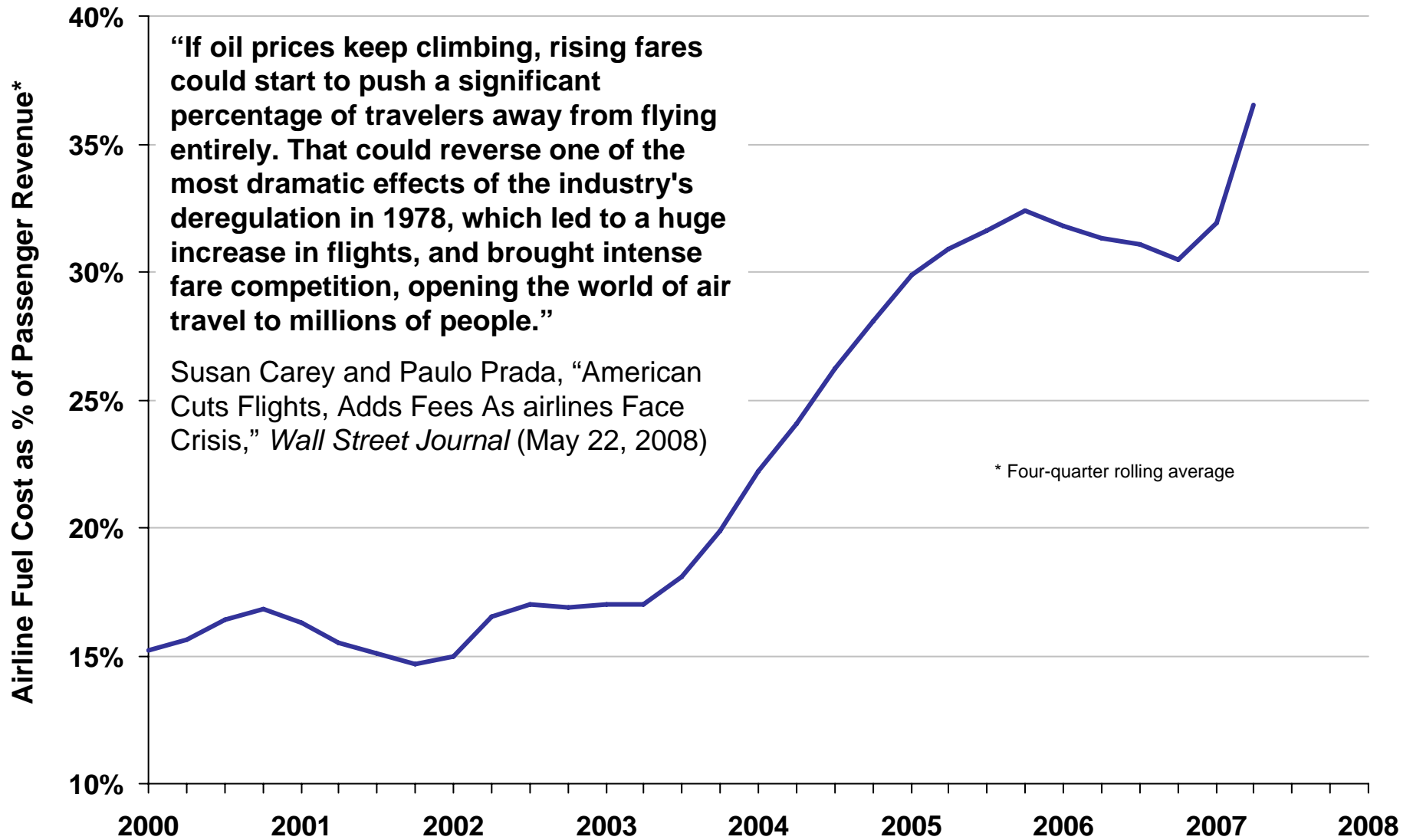


Source: Ameriprise Financial, “Economic Perspective” (May 15, 2008)



# Portion of Ticket Needed to Pay for Fuel Approaching 40%

Airline Fuel Expense Has Risen From 15% of Passenger Revenue in 2000



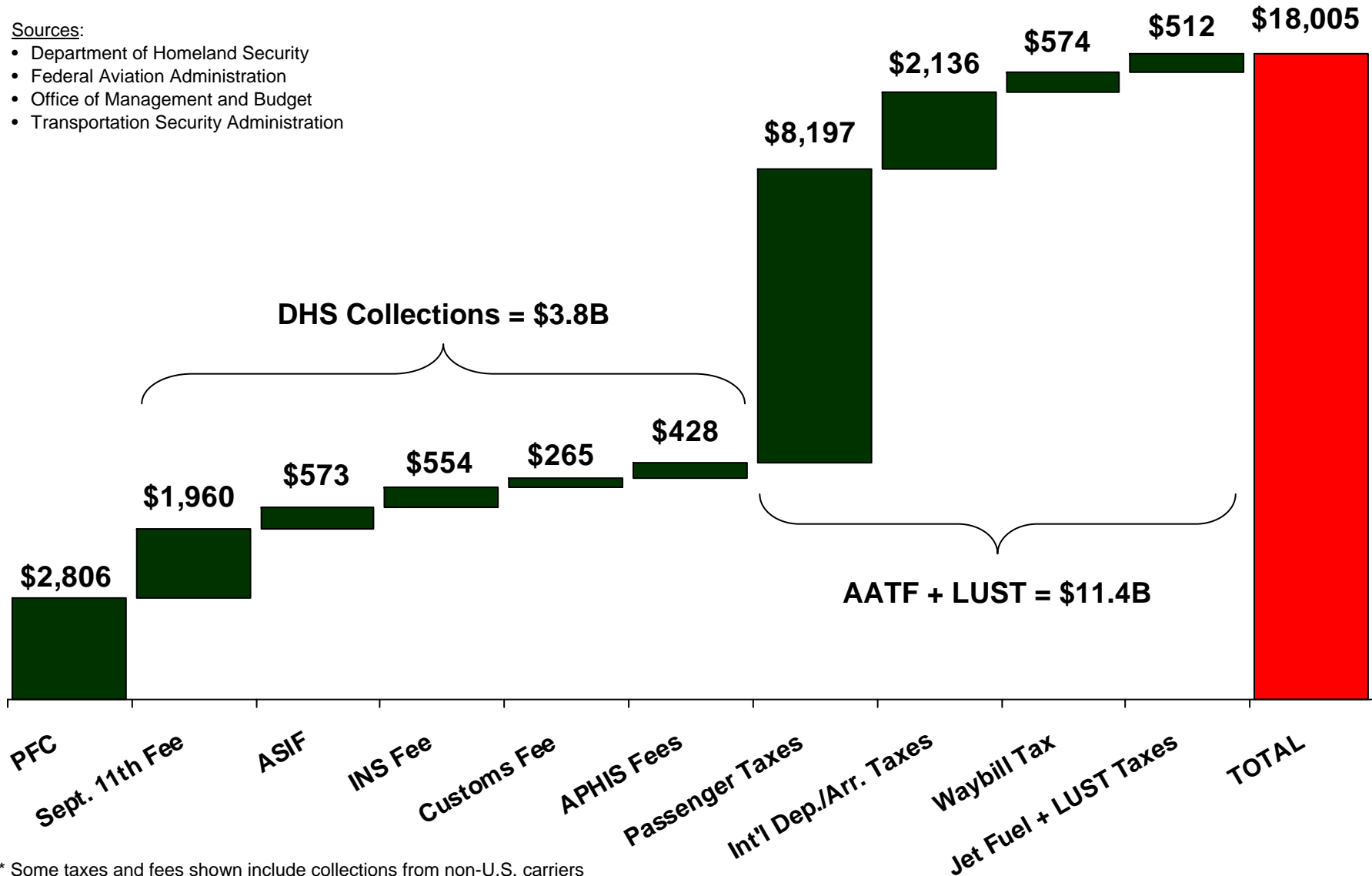
Sources: ATA quarterly airline cost index plus monthly passenger revenue report and monthly fuel cost and consumption report

# “Special” Aviation Taxes/Fees\* Add \$18B Burden

Estimated Collections Shown in \$Millions

Sources:

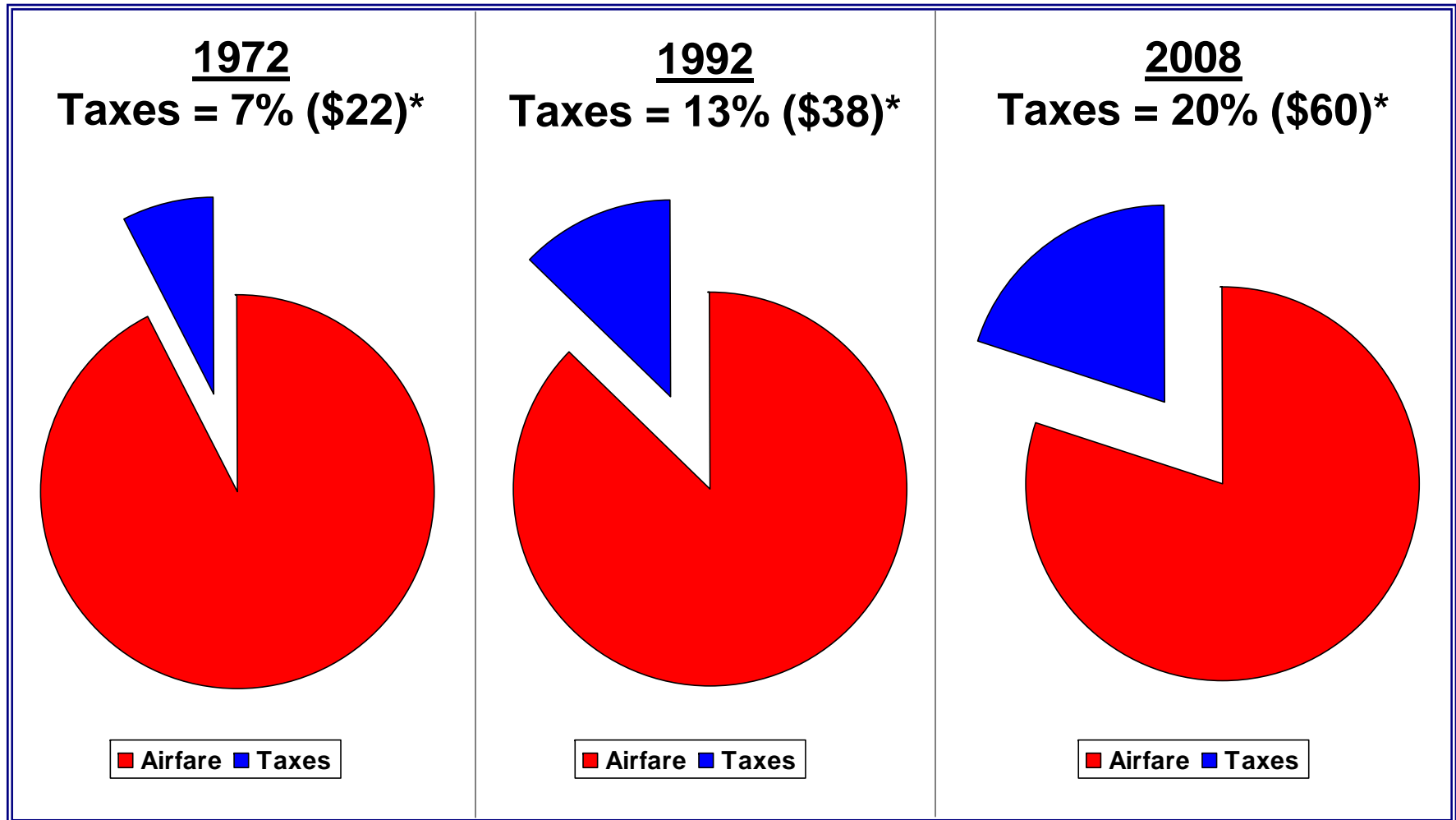
- Department of Homeland Security
- Federal Aviation Administration
- Office of Management and Budget
- Transportation Security Administration



\* Some taxes and fees shown include collections from non-U.S. carriers

# Govt. Taxes/Fees on a \$300 Ticket\* Have Nearly Tripled

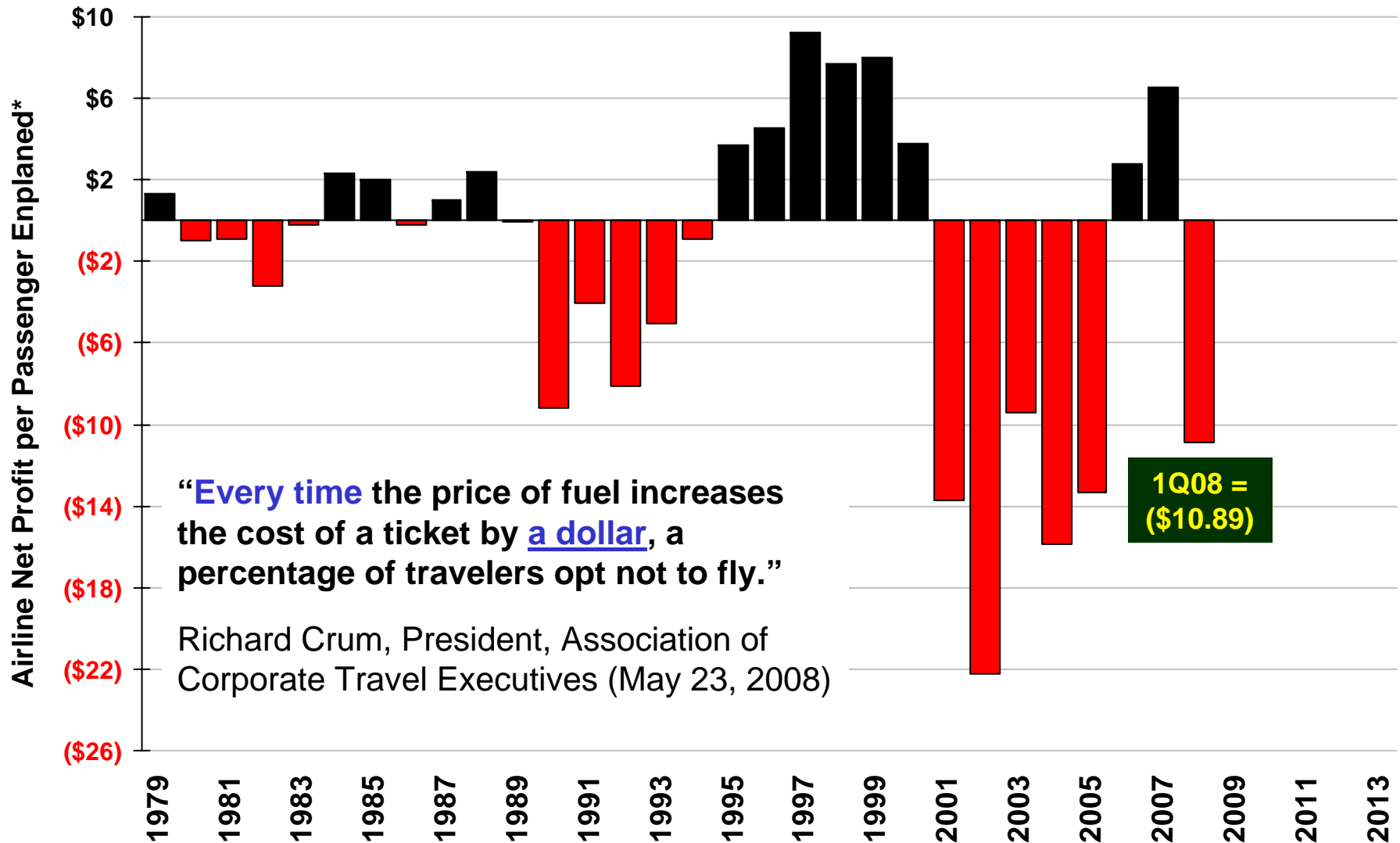
Uncle Sam's Bite Up Sharply Over Three Decades



\*Sample itinerary assumes one-stop domestic round trip with maximum passenger facility charge (PFC) per airport; \$300 total price includes taxes and fees.

# “It’s Only a Few Bucks per Passenger”

In “Deregulated” Era, ATA Member Airlines Average \$1.76 **Net Loss** per Passenger

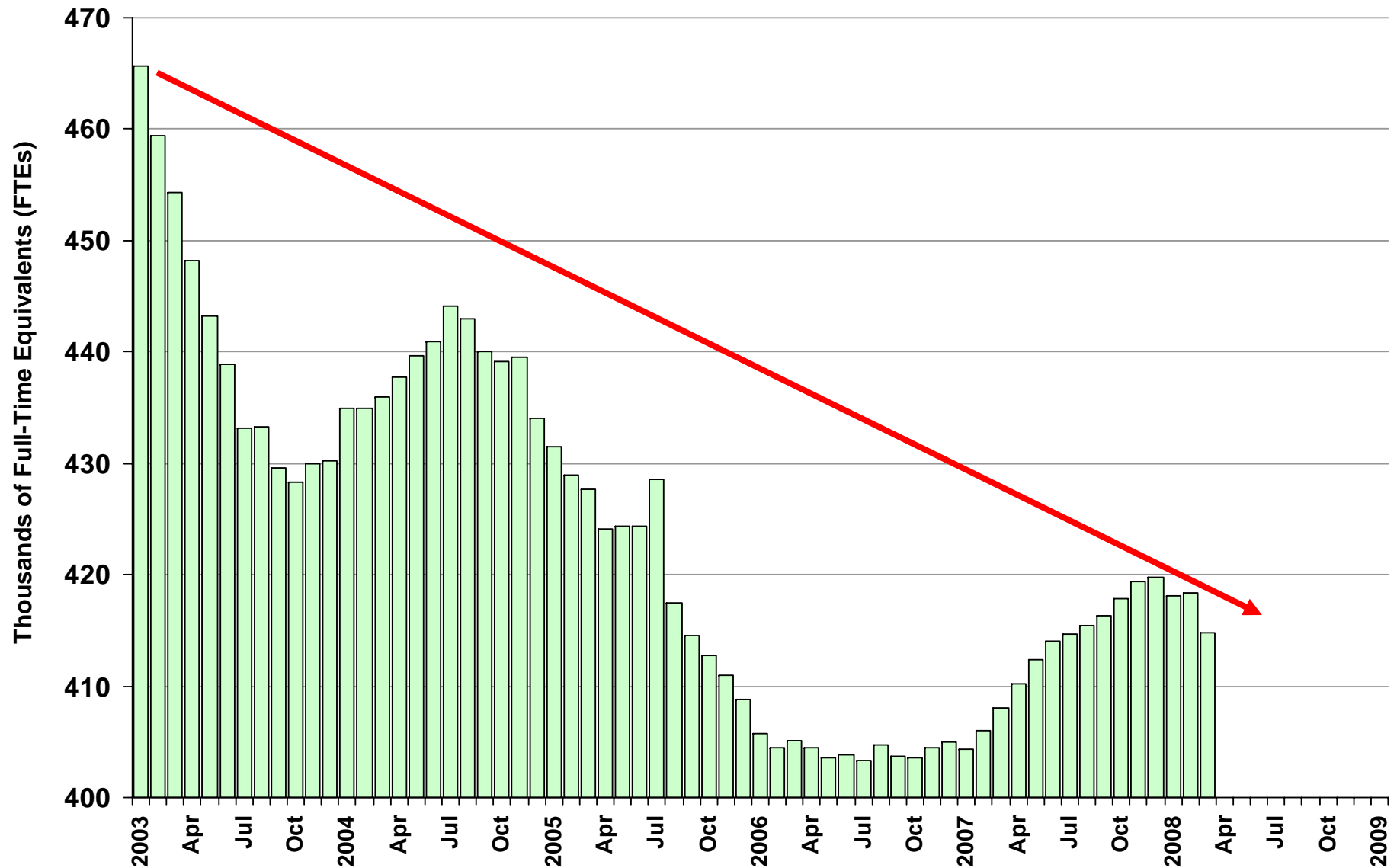


\* Based on ATA-member passenger airlines only for each respective year

Sources: ATA Annual Reports of the U.S. Airline Industry and carrier reports and [www.acte.org/resources/press\\_release.php?id=307](http://www.acte.org/resources/press_release.php?id=307)

# Soaring Fuel Prices Will Take Toll on Airline Employment

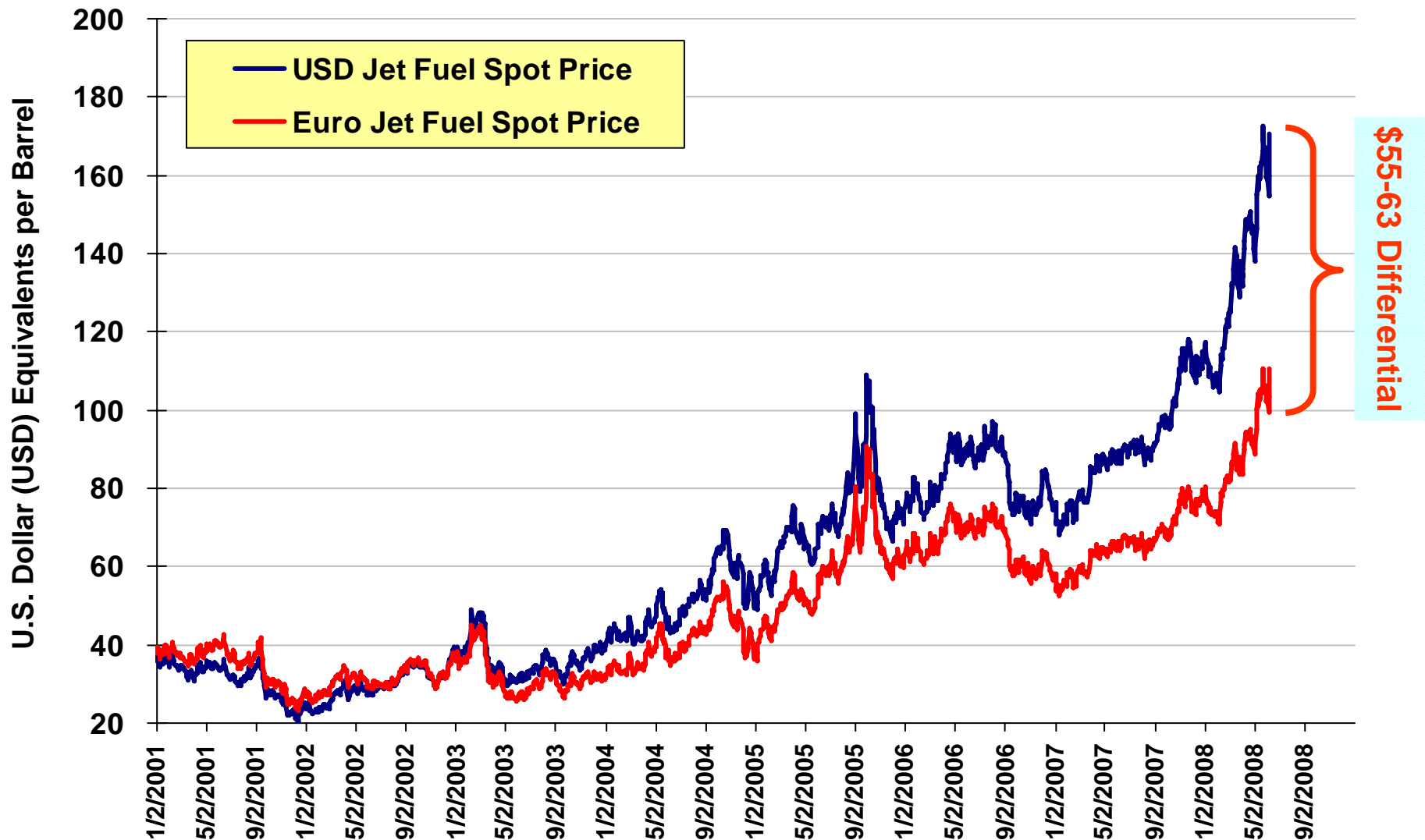
Full-Time Equivalent Employees at U.S. Passenger Airlines Down to 415K



Source: U.S. Bureau of Transportation Statistics

# U.S. Airlines Paying Huge Transatlantic Premium for Jet Fuel

USD-Euro Exchange Rate Has Boosted Fuel Price Differential to > 55%

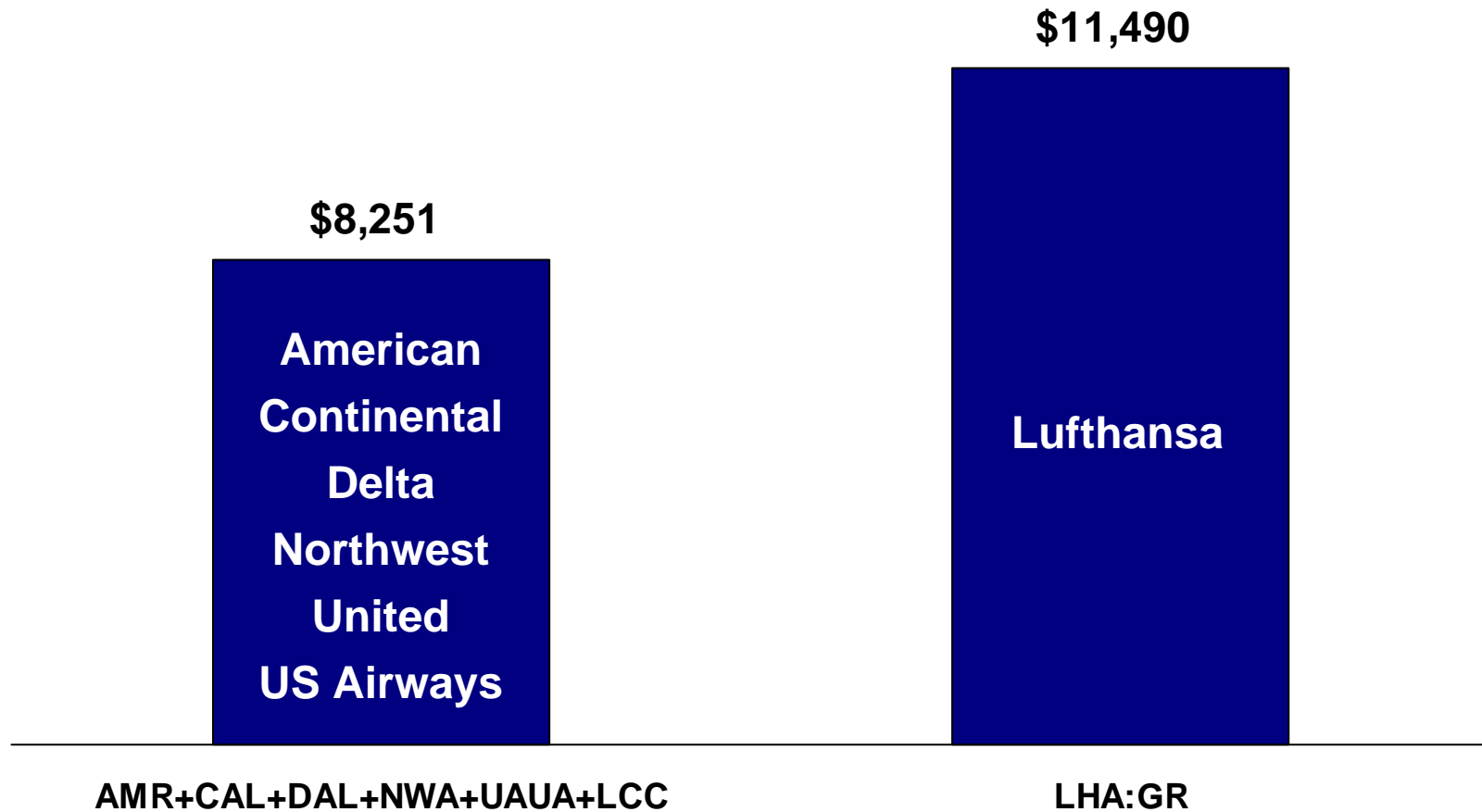


Sources: Energy Information Administration (NYH/USGC/LA) and <http://www.oanda.com/convert/fxhistory>

# The Transatlantic Blues

Equity Market Capitalization (Millions USD) on June 6, 2008

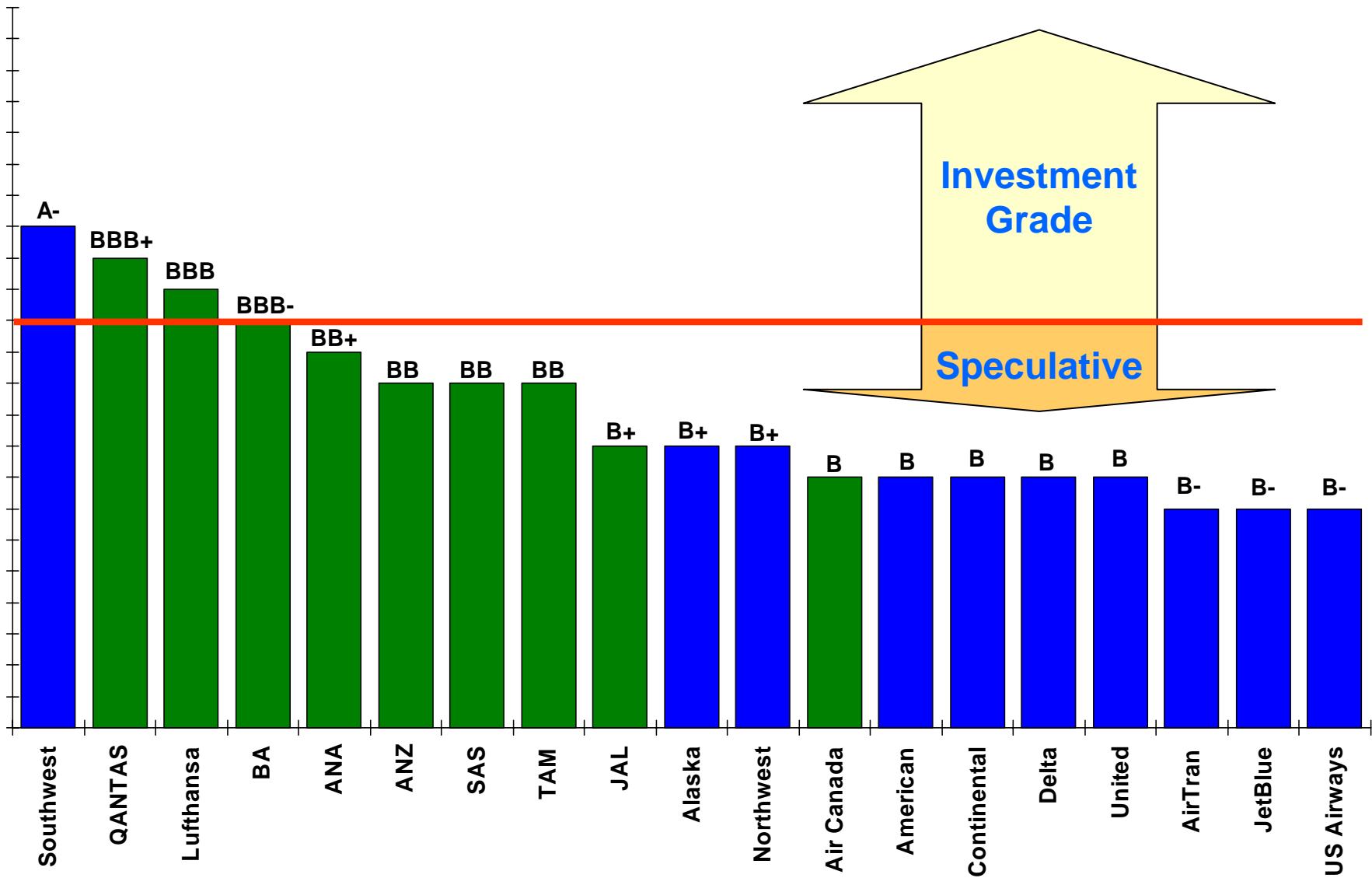
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Sources: Bloomberg (for Deutsche Lufthansa AG – LHA:GR) and MSN

# U.S. Carriers Suffer From Comparatively Weak Credit

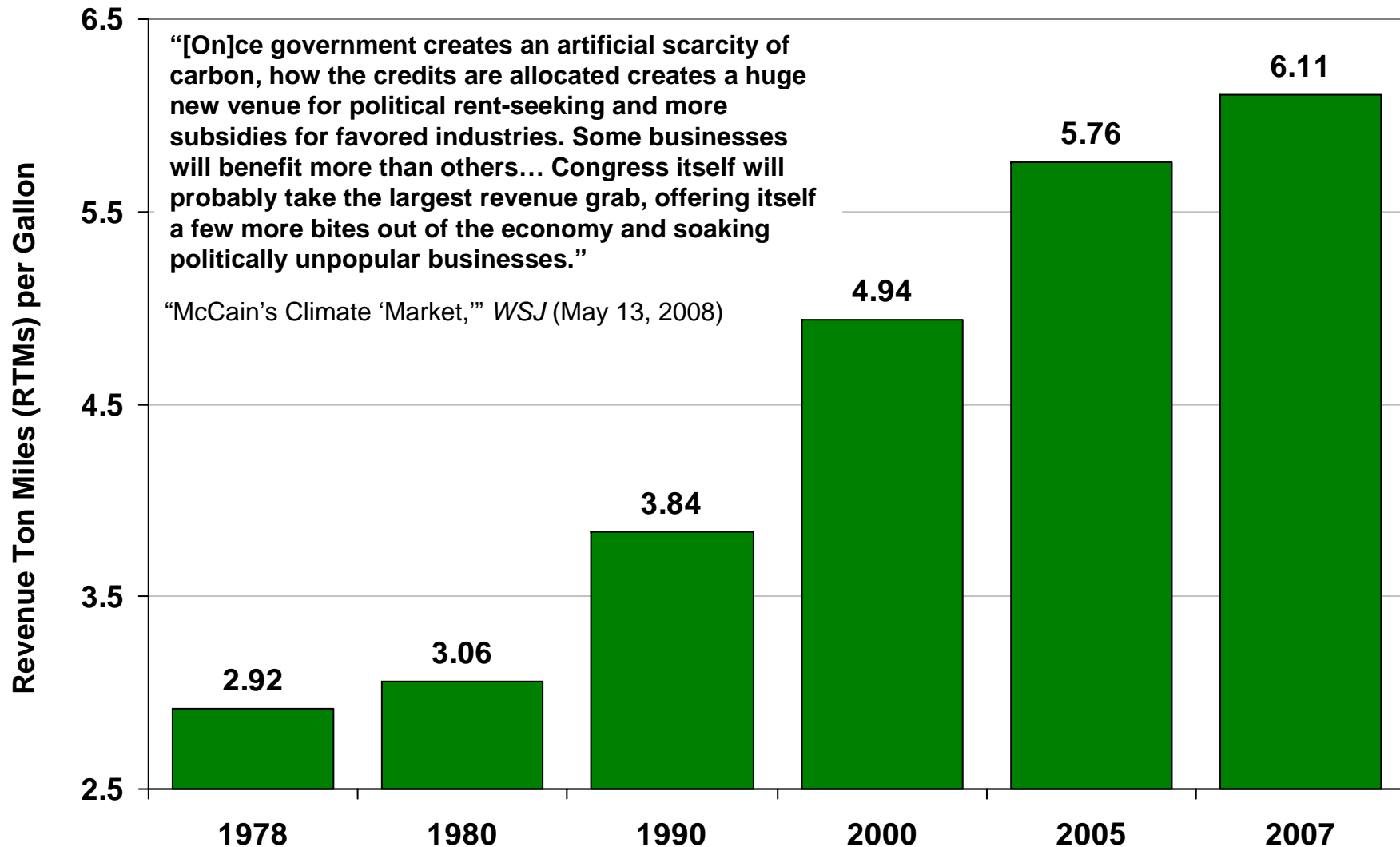
Standard & Poor's (S&P) Corporate Credit Ratings as of May 1, 2008





# U.S. Airlines\* Transport More Traffic With Less Fuel

Fuel Efficiency Up 24% from 2000 to 2007 and 110% from 1978 to 2007



\* U.S. passenger and cargo airlines operating worldwide – passenger and cargo revenue ton miles (RTMs) in all services  
Source: ATA analysis of DOT Form 41 traffic data (T2-Z240) and gallons (T2-Z921)

# Fuel Conservation Via Weight or Drag Reduction

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- One airline saved over 17 gallons/year per pound of weight per airplane after shedding in-flight phones, ovens, excess potable water, and some galley equipment on an older fleet
- In removing seatback phones from its MD-80s and B737-400s, another airline shed 200 pounds per airplane, translating into 3,400+ gallons saved annually
- Alaska Airlines indicated in March 2004 that removing just five magazines per aircraft could save \$10,000 per year in fuel; also, the airline has reduced the weight of catering supplies
- Air Canada considered stripping primer and paint from its 767s to save 360 lbs. per plane
- JetBlue and US Airways and others have moved toward a paperless cockpit
- By removing six seats, JetBlue reduced A320 weight by approximately 904 pounds
- Airlines have been able to remove ovens, trash compactors, or even entire galleys, due to the elimination of hot meals on selected flights; others are using lighter seats; they have also removed magazine racks and replaced hard cabin dividers with curtains
- AirTran ordered carbon fiber Recaro seats for its 737-700s to shave 19.4 pounds per row, resulting in estimated fuel savings of \$2,000 per year per aircraft
- Alaska's new beverage cart, at 20 lbs. lighter, could save \$500,000 in annual fuel costs
- Pratt & Whitney estimates that its EcoPower engine-washing process saves Hawaiian 2.8 pounds (or \$1 million) in fuel annually across the airline's 31 Boeing 767 engines
- Some airlines flush lavatories during extended ground delays to minimize takeoff weight

# Fuel Conservation Through Operational Means

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- En route, airlines utilize sophisticated software optimize speed, flight path, and altitude to reduce airborne consumption and avoid consuming extra fuel while awaiting a gate
- ALK, AA, SWA et al have added life vests on domestic routes (e.g., LAX-CUN, DFW-MIA, MIA-NYC, AUS-TPA) to enable over-water routings in cases where they are more efficient
- American redistributed cargo in the airplane's belly to minimize fuel consumption
- Alaska Airlines is deploying a new flight planning system to yield more direct routings
- American and Delta use super tugs on the ground to reposition aircraft where feasible
- Many have installed winglets to reduce drag – est. fuel savings of 3%-4% per B737-700 flight
- Several airlines taxi in on one engine when conditions permit; AA saves \$10-\$12 million/year
- American, Southwest, and others are using ground power to provide electricity and ground-conditioned air, rather than the plane's auxiliary power unit (APU)
- Delta has deployed a decision support tool to provide pilots with coordinated speed adjustments, allowing more evenly spaced landings and less airspace congestion @ ATL
- Most airlines have reduced excess fuel on international flights with FAA approval thanks to more precise navigation allowed by GPS and better wind forecasts
- New “end-around” taxiway at ATL will save airlines \$26-\$30 million per year; DFW is next
- Delta estimates saving 400 pounds of fuel per flight from continuous descent arrivals @ ATL

# Fuel Conservation Through ATC Reform

Testimony of Mike Cirillo, FAA VP-Systems Operations Services (Feb. 15, 2006)

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- The introduction of Domestic Reduced Vertical Separation Minima (DRVSM) doubled the number of usable altitudes between 29,000 and 41,000 feet, allowing greater access to fuel-efficient routes previously unavailable due to increase separation requirements; FAA estimates savings at \$500M/year
- Area Navigation (RNAV) procedures promote reduced fuel usage through more efficient climb and descent gradients; shorter, more predictable, and more repeatable ground tracks, and reduced delays; annual benefits estimated at tens of millions of dollars at ATL and DFW
- Required Navigation Performance (RNP) uses on-board technology that allows pilots to fly more direct point-to-point routes reliably and accurately; gives pilots lateral guidance and vertical precision; allows more efficient airspace management and reduces fuel burn
- Florida airspace redesign reduced flight distances on standard arrival and preferential routes into south Florida airports, re-routes into adjoining foreign airspace, and departure delays from BOS/NYC/WAS airports to south Florida; FAA estimates \$20M/year in savings
- Advanced Technologies & Oceanic Procedures (ATOP) reduces current separation minima from 100 nautical miles to 50 (or 30 for equipped aircraft); permits more aircraft to access more fuel-efficient trajectories because routes can be spaced more closely together, and aircraft can operate more closely in trail; more efficient trajectories allow aircraft to operate on better time tracks with less excess fuel, consequently allowing them to carry extra payload; estimated to save airlines about 6.5 million pounds of fuel (or about \$8 million a year) on oceanic flights from the U.S. to the Caribbean and South America
- User Request Evaluation Tool permits controllers to predict potential aircraft-to-aircraft and aircraft-to-airspace conflicts earlier, allowing them to construct alternative flight paths or cancel climb or descent restrictions; addresses conflicts strategically rather than tactically, with fewer deviations to the route or altitude and less restrictive climb or descent profiles; estimated FY05 savings = 25M aircraft miles

# Potential Benefits of NY/NJ/PHL Airspace Redesign

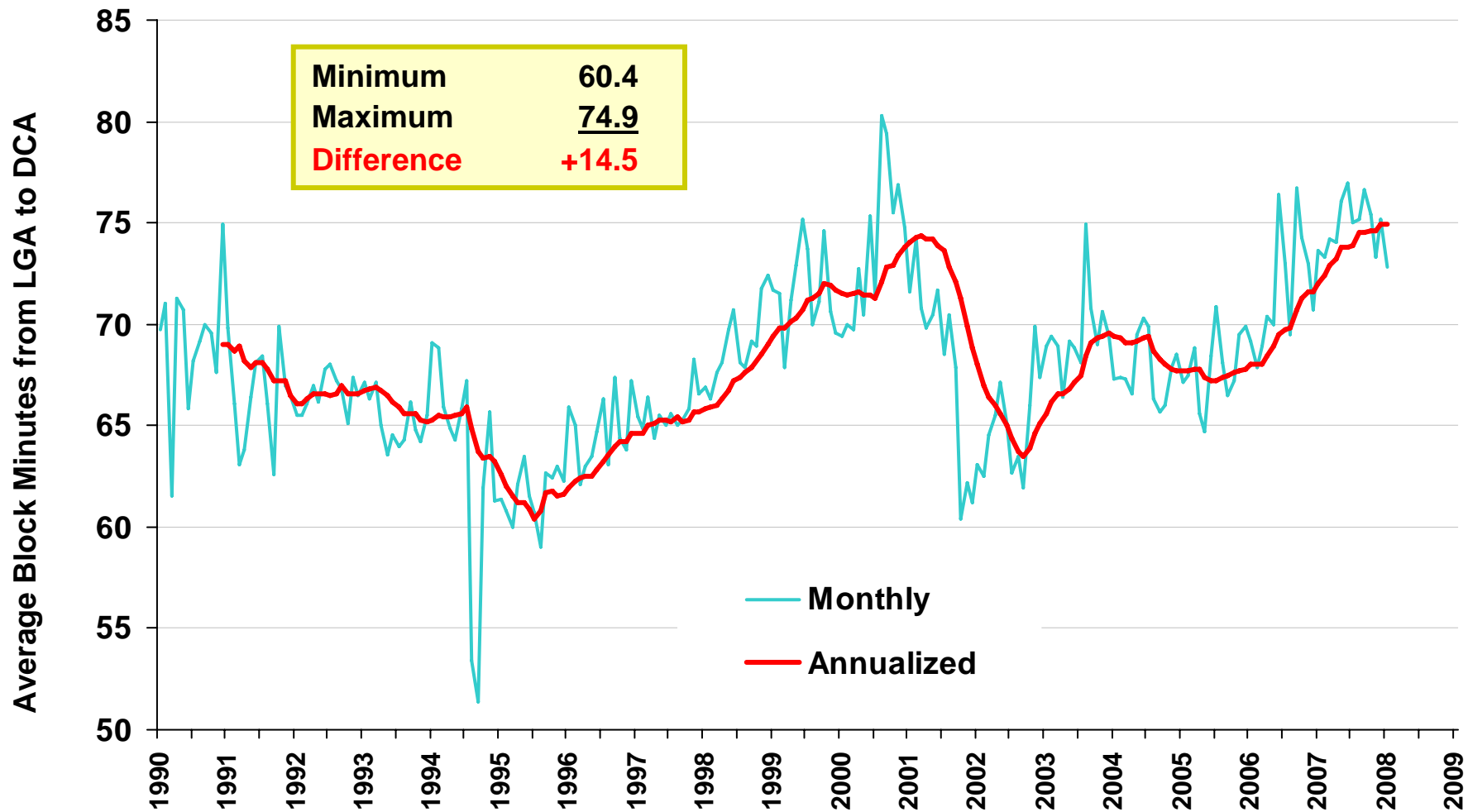
FAA Press Release, Fact Sheet and Briefing (Sept. 5, 2007)

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- On Sept. 5, 2007, the FAA called for new flight patterns over five states and new procedures that will affect more than 15 FAA facilities
- New plan combines high- and low-altitude sectors to create more efficient arrival/departure routes, reducing delays while improving safety (less complexity and voice communications)
- Integrates NY TRACON airspace with portions of surrounding en route centers' airspace; allows controllers to direct IFR traffic more efficiently; improves use of available runways
- Key (estimated) benefits are:
  - ✓ 20% reduction in airport delays over five-year period of implementation
  - ✓ 12M fewer minutes of delay annually, yielding up to \$9B in benefits to air carriers, passengers and local businesses in 2011
  - ✓ Saves \$248M/year in direct operating costs plus \$37M in severe-weather delay costs
  - ✓ 600,000 fewer people exposed to noise

# Are We Experiencing Continental Drift?

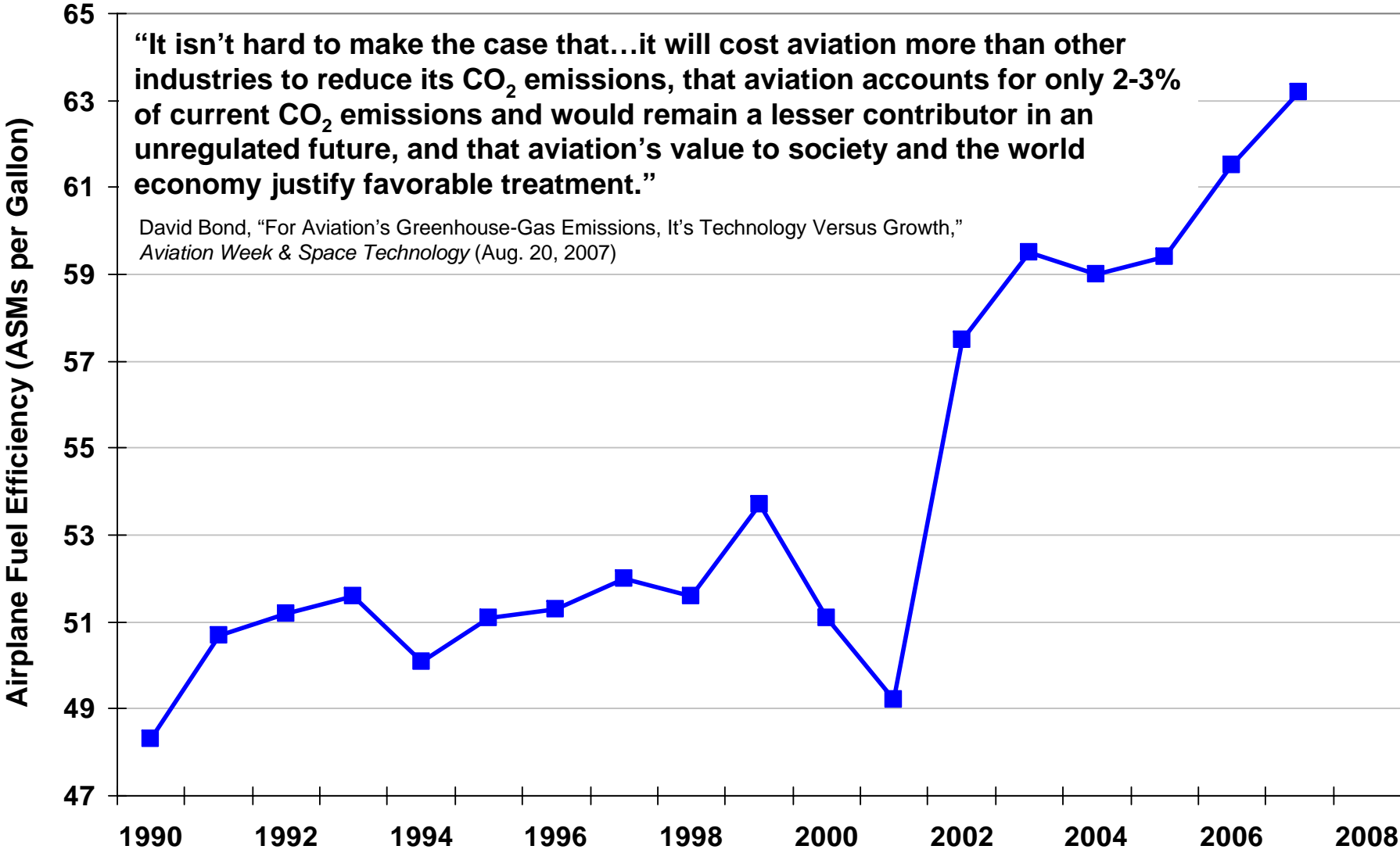
LGA to DCA: "Growth" in Block Time Costs \$9.9M Annually (\$879 per Flight)\*



\* Assumes \$60.46 per minute in direct (aircraft) operating costs per <http://www.airlines.org/economics/specialtopics/ATC+Delay+Cost.htm>

Source: ATA analysis of DOT T-100 segment database

# U.S. Airlines Have Steadily Improved Fuel Efficiency



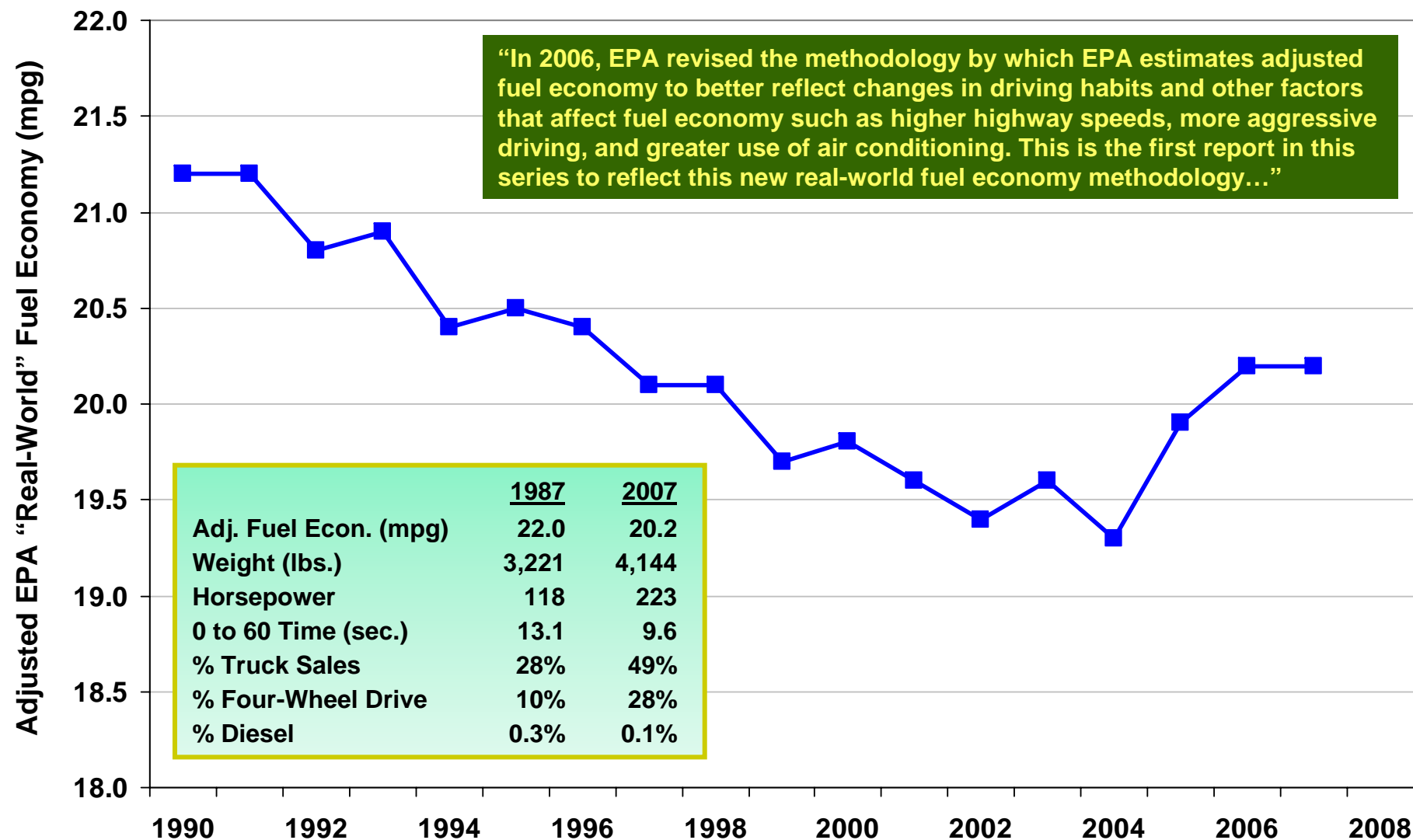
**“It isn’t hard to make the case that...it will cost aviation more than other industries to reduce its CO<sub>2</sub> emissions, that aviation accounts for only 2-3% of current CO<sub>2</sub> emissions and would remain a lesser contributor in an unregulated future, and that aviation’s value to society and the world economy justify favorable treatment.”**

David Bond, “For Aviation’s Greenhouse-Gas Emissions, It’s Technology Versus Growth,” *Aviation Week & Space Technology* (Aug. 20, 2007)

Source: ATA Airline Cost Index

# Fuel Economy of Light-Duty Vehicles Has Fallen Since 1990

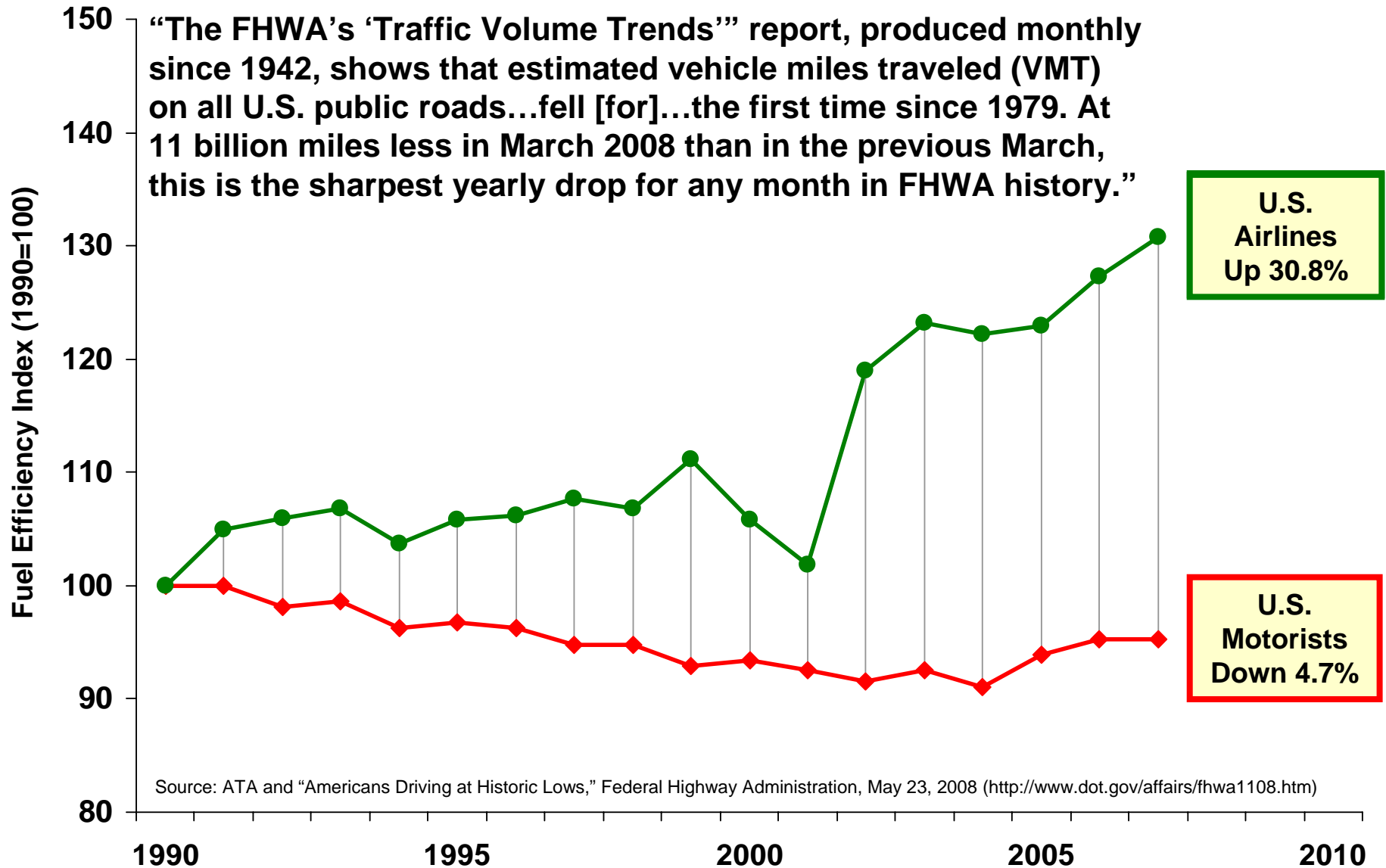
Over Two Decades: Heavier, Faster and Less Fuel-Efficient



Source: U.S. Environmental Protection Agency, "Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2007" ([EPA420-S-07-001](#))



# Fuel Efficiency of U.S. Airlines Up 30.8% Since 1990, U.S. Motorists (Personal Vehicles) Down 4.7%



# Potential Environmental Benefits of ATC Reform

## Promoting a Single European Sky

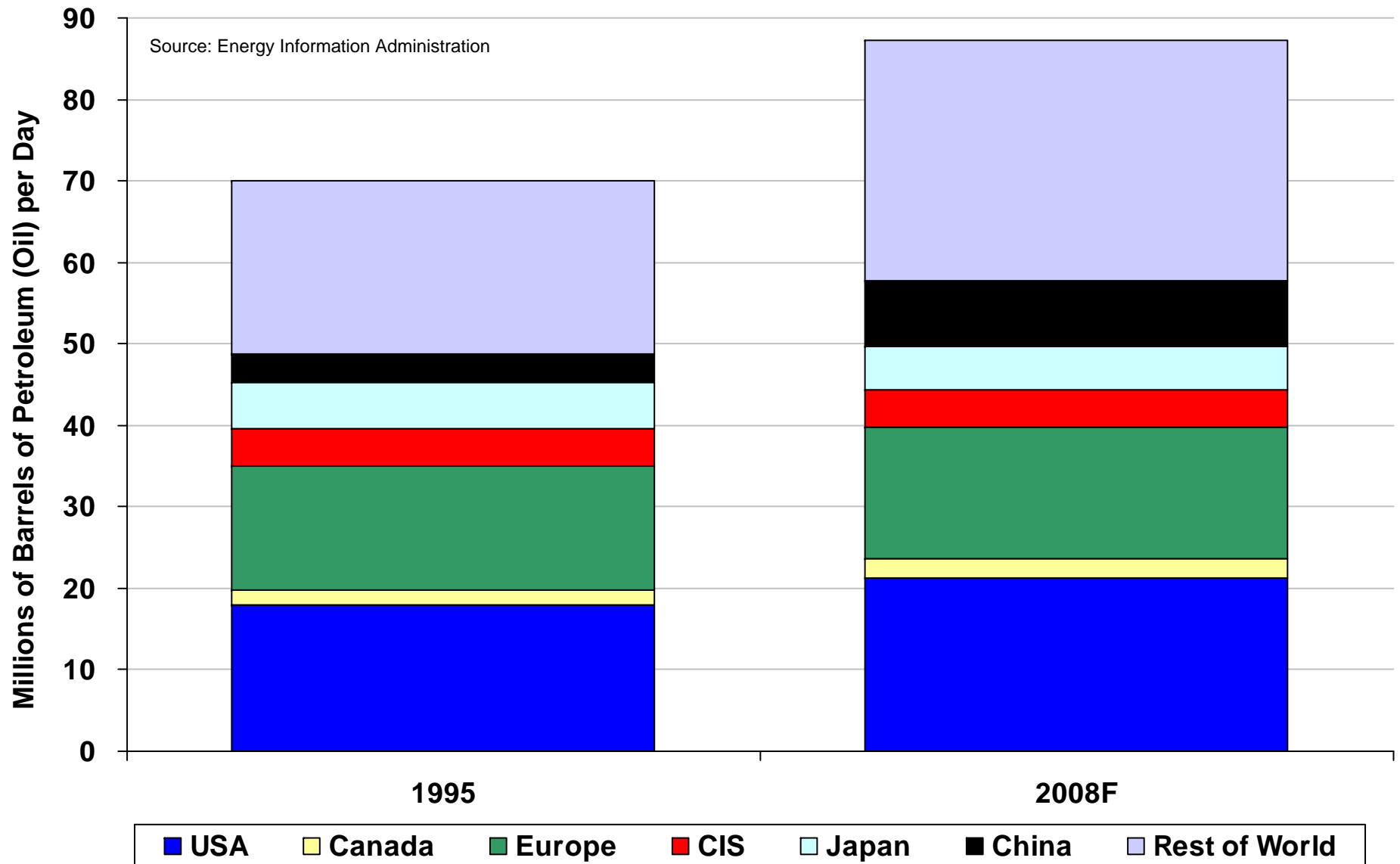
“Europe has achieved a single currency...but the 34 European air navigation service providers are living in a completely different age, wasting 12 million tons of CO<sub>2</sub> annually in delay and inefficiencies.... If we could shave even just a minute off every commercial flight, the potential savings are 5 million tons of CO<sub>2</sub> and \$3.8 billion.”

IATA CEO Giovanni Bisignani

*“Airlines Seek Unified Air Traffic System for Europe” (Oct. 18, 2007)*

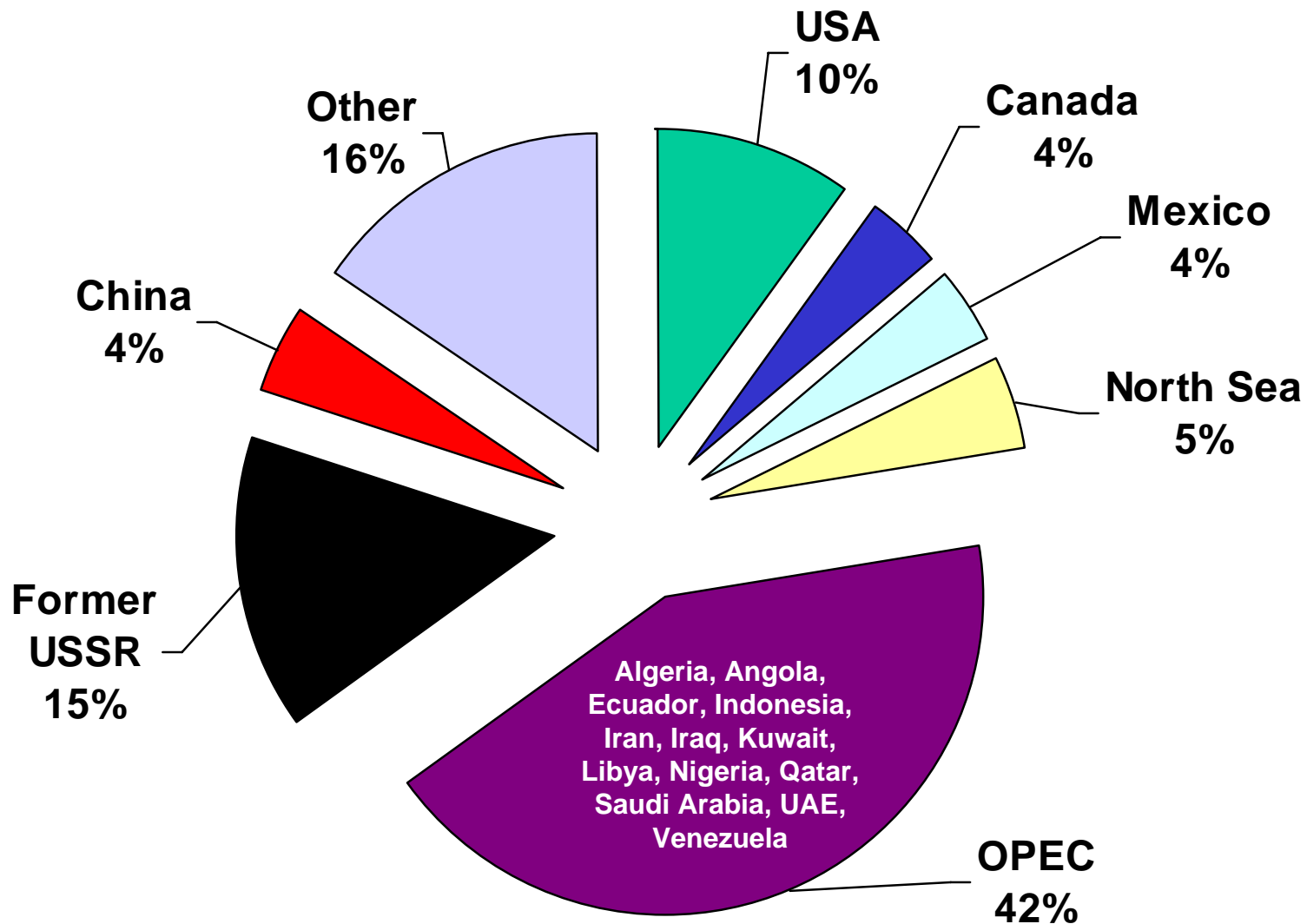
# World Consumption of Petroleum Continues to Grow

Rapid Growth of Chinese Economy Has Helped Drive Total Toward 90M bbls/day



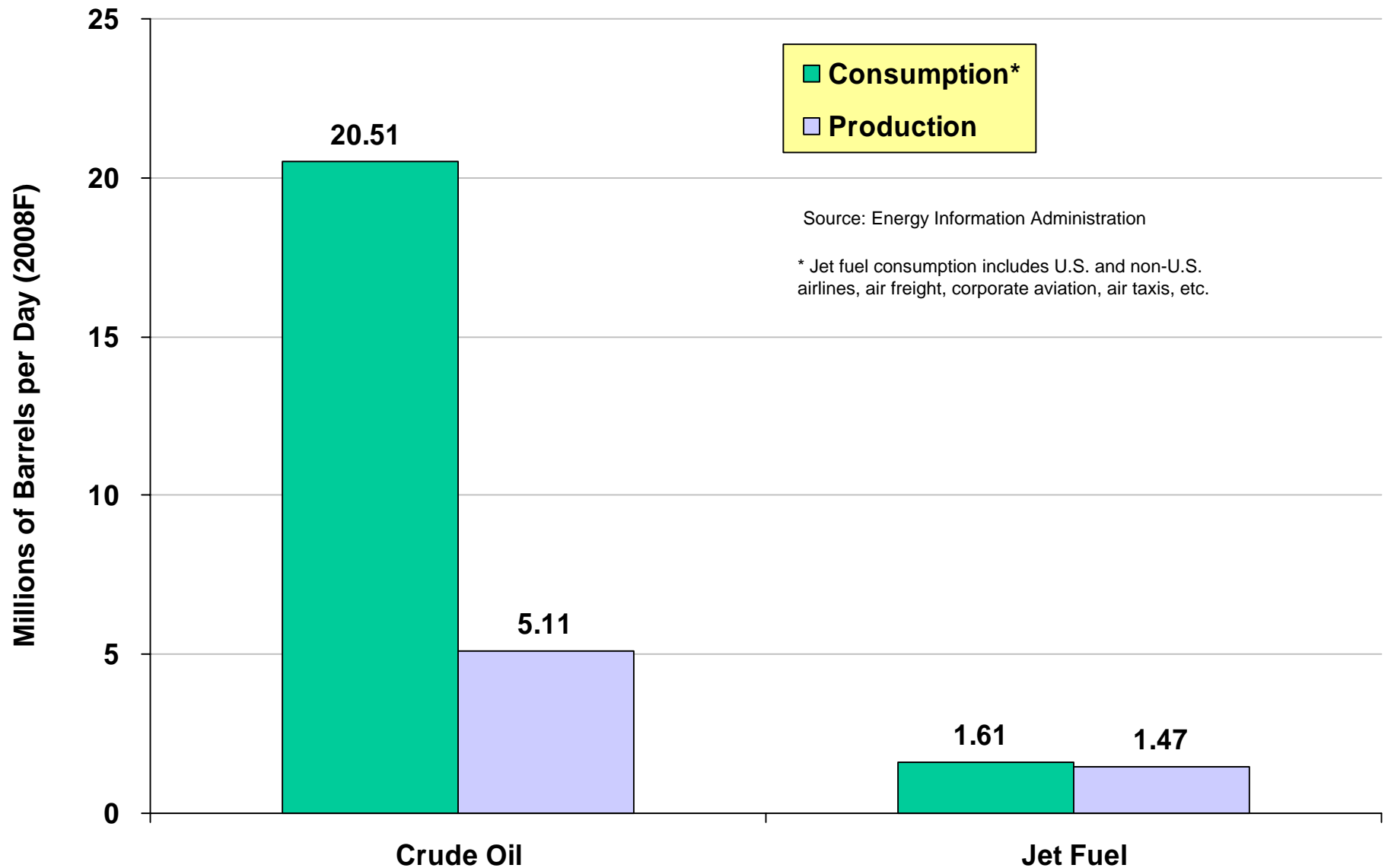
# USA Accounts for Only 10% of Crude Oil Production

Estimated Share of World Production, 2008F



Source: Energy Information Administration

# Unlike Crude Oil, Most U.S. Demand for Jet Fuel Can Be Accommodated Via Domestic Production





AIR TRANSPORT ASSOCIATION

