Airline Industry Recent Trend Update (November 2005)

With the help of the Faculty and Students of the MIT Global Industry Study

Prof. R. John Hansman

Traffic Source: Sage Analysis courtesy Prof Ian Waitz
Scheduled Revenue Passenger-Kilometers by Region

Data source: ICAO, scheduled services of commercial air carriers
Freight Trends by Region

Freight Tonne-Kilometers by Region

Data source: ICAO, scheduled services of commercial air carriers
U.S. Domestic RPMs

Domestic Traffic - RPMs (Billions)

Data source: ATA, US member airlines, scheduled mainline service
U.S. Airline Load Factors 2000-2005

Domestic Traffic - Load Factor

Source: ATA Monthly Passenger Traffic Report
Data source: ATA, US member airlines, scheduled mainline service
U.S. Average Domestic Yield 2000-2005

Data source: ATA Monthly Airfare Report, 8 US major airlines excluding Southwest (WN).
US Systemwide Passenger Revenue as % of GDP

Historical Band

*Four-quarter rolling passenger revenue derived from government filings of major and national passenger airlines

Sources: ATA Airline Cost Index; Bureau of Economic Analysis; U.S. Department of Transportation

ATA Analysis
Data source: ATA Monthly Airfare Report, 8 US major airlines excluding Southwest (WN).
Atlantic Yield 2000-2005

Yield - Atlantic
(c per mile)

Data source: ATA Monthly Airfare Report, 8 US major airlines excluding Southwest (WN).
Latin Yield 2000-2005

Yield - Latin
(c per mile)

Data source: ATA Monthly Airfare Report, 8 US major airlines excluding Southwest (WN).
Pacific Yield 2000-2005

Yield - Pacific
(c per mile)

Data source: ATA Monthly Airfare Report, 8 US major airlines excluding Southwest (WN).
US Airlines Net Profit Model

Best Fit of Undamped Oscillation

Cycle Period = 11.3 yr  eFolding Time = 7.9 yr
Airline Profits (Losses)

Data source: Airline Financial Data, [airlines websites]
Profitable Air Carriers During 2005 Q2

Data source: Airline reports
Cargo Operation Not Affected

Data source: Companies’ annual reports
Market Cap: US Majors, 07-Sep-2005

Total Market Cap: $18.6 billion

Data source: Yahoo Finance.
Current Market Cap vs. RPM Share
US Majors

Source: Yahoo! Finance and airline traffic reports
Chap 11 Bankruptcy

- TWA
- US Air
- United
  - 12/2002 - present
- Delta
  - 09/2005 - present
- Northwest
  - 09/2005 - present
- ATA
  - 10/2004 – present
Source: Bureau of Transportation Statistics Schedule T-1 ASM Analysis data
## LCC Profitability

<table>
<thead>
<tr>
<th>Net Profit Margin</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>1H05</th>
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<tbody>
<tr>
<td>20.0%</td>
<td>Frontier Southwest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.0%</td>
<td></td>
<td>JetBlue</td>
<td></td>
<td>AirTran JetBlue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0%</td>
<td></td>
<td>Southwest Frontier</td>
<td>JetBlue</td>
<td>Southwest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.0%</td>
<td></td>
<td>Spirit</td>
<td>Southwest AirTran</td>
<td>America West Frontier ATA/Spirit</td>
<td>Southwest</td>
<td>AirTran</td>
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<tr>
<td>0.0%</td>
<td></td>
<td>America West</td>
<td>AirTran</td>
<td>Frontier Spirit</td>
<td>Frontier America West</td>
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<tr>
<td>(5.0%)</td>
<td></td>
<td>ATA</td>
<td>America West</td>
<td>National</td>
<td></td>
<td>AirTran America West Frontier</td>
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<tr>
<td>(10.0%)</td>
<td></td>
<td>Midway</td>
<td>Spirit</td>
<td>America West</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(15.0%)</td>
<td></td>
<td>National</td>
<td>AirTran</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(20.0%)</td>
<td></td>
<td>JetBlue Vanguard</td>
<td></td>
<td>America West</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Vanguard Midway</td>
<td>National Vanguard Midway</td>
<td>Independence ATA</td>
<td>Spirit ATA Independence</td>
</tr>
</tbody>
</table>

Source: DOT Form 41 reports  ATA Analysis
Low-Cost Carrier Envy (or not)
Emergence of LCCs

Canada (7, 1 in 2004)
- CanJet
- HMY Airways
- JetsGo Airlines
- Tango Airlines

USA (19, 4 in 2003/2004)
- AirTran
- Allegiant Air
- American West
- ATA
- Frontier Airlines
- Interstate Jet
- JetBlue Airways
- Midwest Express
- Pan American
- Southeast Airlines
- Southwest Airlines
- Spirit Airlines
- Song
- Sun Country Airlines
- USA 3000 Airlines
- Vacation Express
- Ted
- Independence Air
- Virgin USA

Europe (60, 3 in 2004)
- Aer Arann
- Air 2000
- Air Baltic
- Air Berlin
- Air Finland
- Air Luxor Lite
- Air Polonia
- Air Scotland
- Air Southwest
- Air Wales
- Alpi Eagles
- Azzurra Air
- Baboo
- Basiq Air
- Bexx Air
- BMI Baby
- British European
- BudgetAir
- Corendon
- Deutsche BA
- EasyJet
- Evolavia
- Excel Airways
- Fairline Austria

Asia/Pacific (20, 8 in 2004)
- Air Arabia
- Air Asia
- Air Deccan
- Athena Air Services
- Citilink
- Freedom Air
- Lion Airways
- One-Two-Go
- Skymark Airlines
- Skynet Asia Airways
- ValuAir

South America (3)
- Bra
- Gol
- U Air

Africa (2)
- 1Time
- Kulula

Total 111 LCCs, 17 started/to start in 2003/2005

Source: http://www.etn.nl/lcostair.htm, airline news
America West - USAirways
Proposed Merger
America West - USAirways
Proposed Merger
America West - USAirways
Proposed Merger
Trends in Fuel Price

Average Crude Oil and Jet Fuel Prices

Data source: ATA; U.S. major, national, large regional passenger and cargo airlines; all services
Sept 1st data: http://www.bloomberg.com/energy/
Increasing Jet Fuel Crack Spread

Source: Air Transport Association analysis of Energy Information Administration data
Fuel Efficiency

Source: ATA data
US Airlines Net Profit Model

Best Fit of Undamped Oscillation

Cycle Period = 11.3 yr  eFolding Time = 7.9 yr

2005 Q1 & Q2 results for the top 11 US airlines
Airline Profits Adjusted for Constant Fuel Price

Assumptions:
- Fuel price: 69 c/gallon
- Adjustment made on the basis of:
  - difference between actual and assumed fuel price
  - annual fuel consumption
Employees Full Time:
US Network Carriers 2001-2005

US Network Carrier Employees

Source: US DOT
Employees Full Time: Low Cost Carriers 2001-2005

Low-Cost Carrier Employees

Source: US DOT
Productivity Improvements Driving Cost Relief
Network Restructuring, Work Rules, Human Capital, Outsourcing, Technology

Source: ATA Airline Cost Index for U.S. major and national passenger airlines
POSITIVE VIEWS OF EMPLOYEE MORALE

- Source: The Wilson Center for Public Research, Inc. – based on 150,674 interviews conducted with pilots or flight attendants from 1/1/2001 to 9/20/2005
Pension Obligations at the end of year 2004

Source: Airlines Annual Financial Reports (US airways (successor company) figure corresponds to year 2003)
Retirement Benefits Paid in 2004

Source: Airlines Annual Financial Reports (US airways (successor company) figure corresponds to year 2003)
## Retirement Plan Terminations

### Summary of US and United Plan Terminations

<table>
<thead>
<tr>
<th>($ in billions)</th>
<th>US Airways</th>
<th>United Airlines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Termination Liability</td>
<td>$7.9</td>
<td>$16.8</td>
</tr>
<tr>
<td>Assets</td>
<td>$2.9</td>
<td>$7.0</td>
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<tr>
<td>Unfunded Termination Liability</td>
<td>$5.0</td>
<td>$9.8</td>
</tr>
<tr>
<td>PBGC Guaranteed Portion of Underfunding</td>
<td>$2.9</td>
<td>$6.6</td>
</tr>
<tr>
<td>Value of Lost Benefits</td>
<td>$2.1</td>
<td>$3.2</td>
</tr>
<tr>
<td>Lost Benefits as % of Total Term. Liability</td>
<td>26.58%</td>
<td>19.05%</td>
</tr>
</tbody>
</table>

Delta and NWA Chap 11 filings estimated at $16B Liability

Source: Subcommittee on Aviation Hearing on Airline Pensions: Avoiding Further Collapse, also NYT
http://www.house.gov/transportation/aviation/06-22-05/06-22-05memo.html
Safety Trend

Hull Loss and/or Fatal accidents – Worldwide Commercial Jet Fleet – 1959 through 2004

Source: Boeing Statistical Abstract
Safety Trend

Hull Loss and/or Fatal accidents – Worldwide Commercial Jet Fleet – 1985 through 2004

Source: Boeing Statistical Abstract
## 2005 Fatal Accidents

<table>
<thead>
<tr>
<th>Date</th>
<th>Aircraft</th>
<th>Operator</th>
<th>Fatalities</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-Feb</td>
<td>Boeing 737-200</td>
<td>Kam Air</td>
<td>104</td>
<td>Afghanistan</td>
<td>CFIT Approach Snow</td>
</tr>
<tr>
<td>3-Aug</td>
<td>Airbus A.340</td>
<td>Air France</td>
<td>0</td>
<td>Canada</td>
<td>Weather Overrun</td>
</tr>
<tr>
<td>15-Aug</td>
<td>Boeing 737-300</td>
<td>Helios Airways</td>
<td>121</td>
<td>Greece</td>
<td>Decompression</td>
</tr>
<tr>
<td>17-Aug</td>
<td>MD-80</td>
<td>West Caribbean Airways</td>
<td>160</td>
<td>Venezuela</td>
<td>Dual Flame Out Fuel?</td>
</tr>
<tr>
<td>24-Aug</td>
<td>Boeing 737-200</td>
<td>TANS</td>
<td>40</td>
<td>Peru</td>
<td>Approach Weather?</td>
</tr>
<tr>
<td>6-Sep</td>
<td>Boeing 737-200</td>
<td>Mandala Airlines</td>
<td>102</td>
<td>Indonesia</td>
<td>Initial Cimb</td>
</tr>
<tr>
<td>23-Oct</td>
<td>Boeing 737-200</td>
<td>Bellview Airlines</td>
<td>117</td>
<td>Nigeria</td>
<td>Enroute</td>
</tr>
</tbody>
</table>

Source: aviation-safety.net
Blacklist Controversy
August 2005

- France
  - Air Koryo (North Korea)
  - Air Saint Thomas (US)
  - International Air Services (Liberia)
  - Lineas Aer de Mozambique (Mozambique)
  - Phuket Airlines (Thailand)

- Belgium
  - Africa Lines (Republic of Central Africa)
  - Air Memphis (Egypt)
  - Air Van Airlines (Armenia)
  - Central Air Express (Democratic Republic of Congo)
  - International Air Tours Limited (Nigeria)
  - Johnsons Air Limited (Ghana)
  - Silverback Cargo Freighters (Rwanda)
  - South Airlines (Ukraine)

- FAA Position (IASA) Assessment by Country
  - Category 1 (meet ICAO Standards)
  - Category 2 (does not meet ICAO Standards)
US Flight Delays
from 1995 to 2005

Source: FAA OPSNET data
US Flight Delays from 2000 to 2005

National Delays (in flights)

Source: FAA OPSNET data
Flight Cancellations

Source: BTS, Airline On Time Performance data
Note: Year 2005 consumer complaints is an extrapolation using data from Jan-Mar 2005

Air Traffic Controller Staffing

ATO Hiring Forecast vs. Losses

Time to CPC (Certified Professional Controller)
Terminal: 8 - 24 months
Enroute: 36 - 60

Source: Air Traffic Controller Workforce Plan - 2004
Projected % Developmental Controllers

From: ATCS Workforce Plan Briefing
Trends in Aircraft Size

Data source: Form 41 Traffic data from Bureau of Transportation Statistics (includes Regional Jets and Turboprops)
U.S. Regional Jet Growth Slowing

Source: FAA registration data from 1995 until the present
Most Common Regional Jets

ERJ 145 (50 seats)
- About 400 aircraft in national fleet
- About 2000 daily flights in January 2003

CRJ 200 (50 seats)
- About 400 aircraft in national fleet
- About 1500 daily flights in January 2003
- Production on hold

CRJ 200
Source: based on manufactures’ a/c specifications. Full pax range of standard version.
World Population Distribution & 2004 Air Transportation Activity

North America
36% Pax
26% Cargo
~160 Airlines
~4100 Airports

Europe
27% Pax
27% Cargo
~200 Airlines
~2400 Airports

Latin America/Caribbean
4% Pax
3% Cargo
~50 Airlines
~580 Airports

Africa
2% Pax
2% Cargo
~20 Airlines
~300 Airports

Middle East
4% Pax
6% Cargo
~20 Airlines
~230 Airports

Asia/Pacific
27% Pax
36% Cargo
~80 Airlines
~1800 Airports

Air Transport: ICAO, R. Schild/Airbus
Passenger and freight traffic represent RPK and FTK share in 2004