U.S. Pilot Labor Supply

Kent Lovelace
Jim Higgins
Trends in Students Interest in Aviation Careers

- Fewer Students interested in Aviation Careers
  - Airline distress and media coverage
  - Low pay entry level careers
- More students looking away from airline careers within aviation
  - Increasing costs
  - Increasing debt
  - Tightening of student loan market
  - Parents less able to help
Student Trends in Aviation Careers

- Airline
- Corporate
- DoD

Linear (Airline)  Linear (Corporate)  Linear (DoD)
Recent Survey of UND CFI’s

• N = 173
• 56% (97) said they wanted to be airline pilots initially
• 60 of those no longer want to go that route
• Only 24% (42) out of 173 are considering an airline career
Trends in Pilot Supply

• U.S. has enjoyed a robust general aviation infrastructure providing a source of pilots
• Those days are ending - image and costs
• We saw a preview of this in 2007-08
  – Offers from regional airlines with only 300 hours of flight experience
What is pilot supply?

– Commercial Pilot
  • Will need anywhere from 1-3 years to obtain
  • Have around 200-250 hours of time
  • Is the basic requirement for employment
  • Competitive qualifications vary with market conditions

– Airline Transport Pilot (ATP)
  • FAA requirement for Airline Captain positions
  • 1500 hours of time
  • 500 hours of X-C (50 nm) time
  • Several years to obtain
Forecast Risks

- Unforeseen economic hardships
- Flight-Time/Duty-Time
- Company growth constraints
  - GHG caps
  - NextGen failures
- MPL
- UAS
- H.R. 3371 ATP Requirement
Pilot Supply Forecasts

- Factors affecting current active pilot supply
  - Attrition (8.94% annually)
    - Retirements (2.12% annually)
    - Other Attrition (6.82% annually, lowest rate 2.94%)
      - Loss of medical
      - Loss of certificate
      - Career transfer
Annual Pilot Attrition – Historical

<table>
<thead>
<tr>
<th>Year</th>
<th>Retirements</th>
<th>Other Attrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>10.41%</td>
<td></td>
</tr>
<tr>
<td>1994</td>
<td>9.29%</td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>6.69%</td>
<td></td>
</tr>
<tr>
<td>1996</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>1997</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>1998</td>
<td>8%</td>
<td>10%</td>
</tr>
<tr>
<td>1999</td>
<td>12%</td>
<td>14%</td>
</tr>
<tr>
<td>2000</td>
<td>10%</td>
<td>12%</td>
</tr>
<tr>
<td>2001</td>
<td>8%</td>
<td>10%</td>
</tr>
<tr>
<td>2002</td>
<td>6%</td>
<td>8%</td>
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<tr>
<td>2003</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>2004</td>
<td>2%</td>
<td>4%</td>
</tr>
<tr>
<td>2005</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>2006</td>
<td>0%</td>
<td>2%</td>
</tr>
</tbody>
</table>

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UND Forecast Pilot Supply

• The UND Pilots Supply Model
  – Entrance Barriers
    • Cost of initial flight training (Risk)
    • Current hiring at major airlines (Reward)
    • Other potential factors
      – Job Satisfaction
      – Prestige
• First predictor:
  – Hiring at major airlines
  – Source: fltops.com
  – Major airlines used: American, United, Delta, Southwest, Northwest, Continental, FedEx, UPS, JetBlue, American West, AirTran, Alaska, ATA, ABX Air
Historical Pilots Hired at Major Airlines vs. New Commercial Pilots Created

Number of Pilots (Thousands)

Source: FltOps.com,
• Second predictor:
  – Flight training costs
  – Source: AOPA
  – Based upon mean flight training cost per hour for a general aviation trainer with flight instructor
  – Several plots from survey, others interpolated
  – Adjusted for inflation (2007 dollars)
  – Actual metric used was year-over-year percentage increase/decrease

- Percent Change from Previous Year:
  - Flight Costs
  - New Pilots

- New Pilots Created (Thousands):
  - 1985 to 2007

Sources: AOPA

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Computed Stepwise Multiple Regression Model

Predictors:
- Risk (Cost of Flight Training)
- Reward (Number of Pilots Hired at a Major Airline)

\[ Y = 1.18(X) - 409(Z) + 8,643; \]

where
- \( y \) = New commercial pilots in 2 years
- \( x \) = Pilots hired at a major airline, and
- \( z \) = Percent change year-over-year in flight training costs

\[ R^2 = .630, F(2,19) = 16.182, p < .001 \]
UNDAERO SPACE

UND Forecast New Commercial Pilots 2010-2025

Number of Pilots per Year (Thousands)

Cumulative Number of Pilots (Thousands)

New Pilots Created
Cumulative

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What about demand?
Long Term Forecast

<table>
<thead>
<tr>
<th>Reason</th>
<th>New Pilots Required 2010-2025</th>
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<tbody>
<tr>
<td>Retirement</td>
<td>107,485</td>
</tr>
<tr>
<td>Aircraft Additions</td>
<td>54,358</td>
</tr>
<tr>
<td>Other Attritions*</td>
<td>139,197</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>301,040</strong></td>
</tr>
</tbody>
</table>

*Using the historic low rate of 2.94%
Forecast Pilot Demand per Year 2009-2024

Number of Pilots Needed


Other Attrition  Retirements  New Aircraft Staffing

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• The UND Forecast Surplus/Shortfall
  – Supply derived from model
  – Demand derived from FAA forecast aircraft, retirements and other attrition
  – Forecast in a nutshell:
    • Between 2010 and 2025, there will be an 85,777 pilot shortfall
There is also substantial worldwide pilot demand over the next 20 years:
- Many continents do not have infrastructure in place to train pilots:
  - South America
  - Middle East
  - Africa
  - Asia
- The United States and Europe will likely provide many of these pilots.
Global Estimations of Pilot Needs 2009-2025
Aggregate Average of ICAO, Boeing, Airbus Forecasts

North America 89,500
Europe 83,900
Middle East 17,000
Asia/Pacific 96,300
South America 21,000
Africa 10,200

Source: ICAO, Boeing, Airbus

Has Training Capacity
Lacks Training Capacity

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Mitigation Strategies

• Securing Supply
  – Airline industry must communicate that there is a future need
  – Airline involvement in student recruitment
  – Airline sponsored career path (JetBlue)
  – Airline sponsored scholarships/student debt retirement
  – Sponsored Ab Initio flight training
Concluding Remarks

- Pilot supply can be predicted using a risk-reward model
- Pilot demand is contingent upon new aircraft delivered into the market, retirements and other attrition
- All forecasts point to civilian pilot shortfalls
- Supply shortfall mitigation strategies should be implemented
Thank you!

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Contingency Slides
Historical Pilots Hired at Major Airlines vs. New Commercial Pilots Created 2 years Later

\[ y = 1.1587x + 7809.9 \]

\[ R^2 = 0.4636, F(1,20) = 17.285, p < .001 \]

Sources: FltOps.com, GAMA
Historical Flight Costs vs. New Commercial Pilots Created 2 Years Later

Number of New Pilots (Thousands)

Percent Change Flight Costs from Previous Year

\[ y = -38617x + 11950 \]

\[ R^2 = 0.1486, F(1,20) = 3.491, p = .076 \]
New and Active Commercial Pilots – Historical

- New Pilots
- Active Pilots

Source: GAMA, FAA
Pilots Available to Staff Active Aircraft – Historical

Source: FAA Forecasts, GAMA, UND
Flight Training Costs Forecast Assumptions

- Historically flight costs have climbed 1.28% above inflation (CPI)
- Using the OMB outlook, CPI from 2008-2025 is forecast to be 1.9% annually
- Therefore, a 3.18% cost growth factor was used for the duration of the supply forecast
FAA Forecast Active Aircraft 2009-2025

Number of Aircraft

Sources: FAA 2009 Forecast, FAA 2001 General Aviation and Part 135 Activity Surveys
• Pilot Demand

– Civilian pilots staff aircraft according to the following industry-aggregated ratios:

<table>
<thead>
<tr>
<th>Type of Operation</th>
<th>Number of pilots/aircraft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legacy and Major Airlines</td>
<td>12.65</td>
</tr>
<tr>
<td>Regional Jet Operators</td>
<td>9.73</td>
</tr>
<tr>
<td>Regional Turboprop Operators</td>
<td>8.60</td>
</tr>
<tr>
<td>Fractional Operators</td>
<td>6.34</td>
</tr>
<tr>
<td>Corporate/Business Operators</td>
<td>1.50*</td>
</tr>
</tbody>
</table>

Sources: 10-K Annual Reports, Company Literature
*Estimated due to ambiguous data and large variance
Forecast Pilot Demand for New Aircraft 2009-2025

Number of Pilots Required (Thousands)

Source: 2009 FAA Forecast
Pilot Retirements Forecast 2009-2027
Unconstrained Age 65, Fixed Wing

Source: 2007 FAA U.S. Civil Airmen Statistics, Tables 7, 8, 12
Forecast Pilot Attrition Other than Retirement at 2.94% Annually 2009-2024

Source: UND, GAMA