

# Gateway/Pathway Programs for Flight

## Pilot Supply Forecast

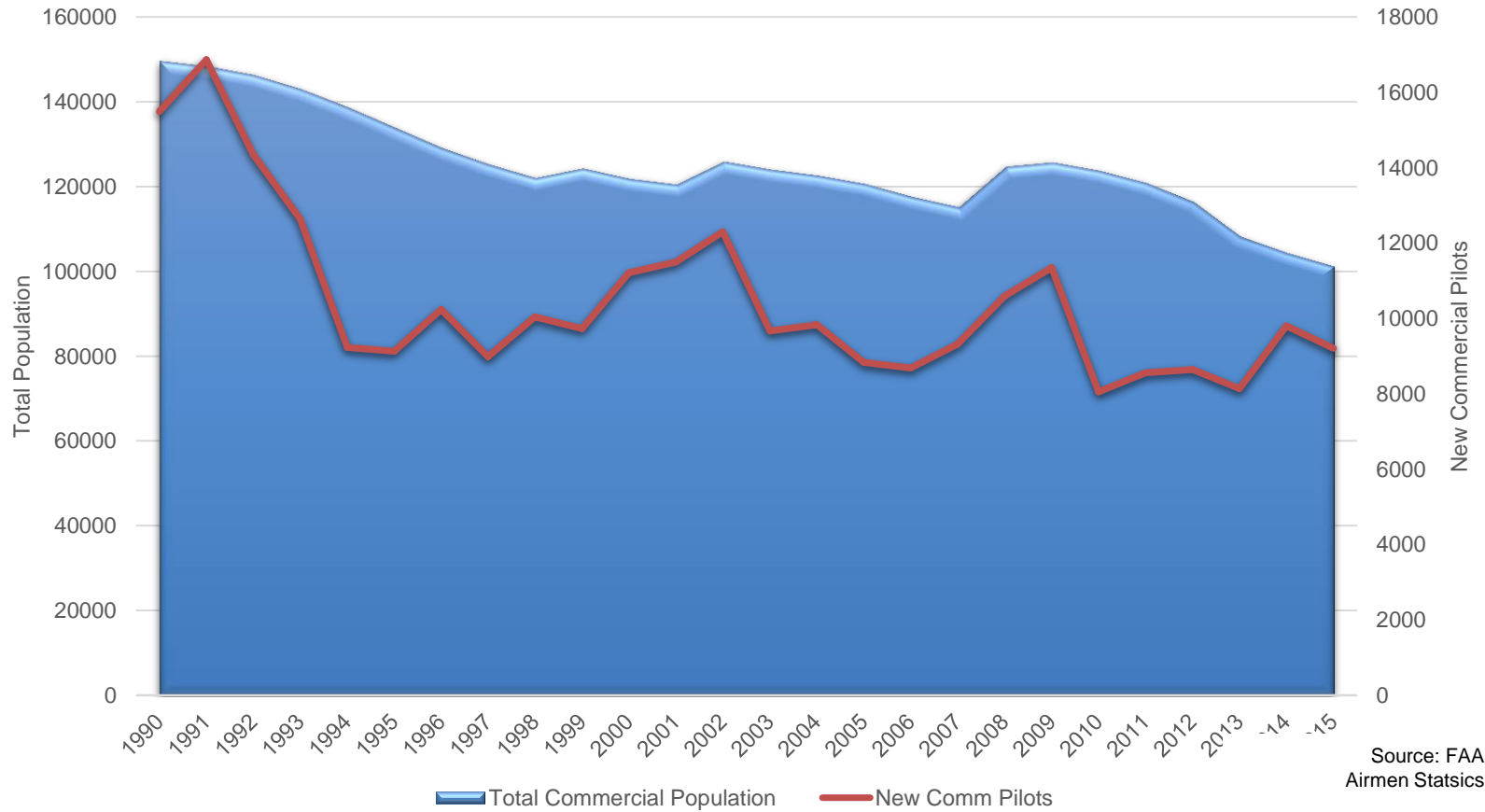


# Can the number of new pilots entering the workforce in the future be predicted based upon trends and other variables?

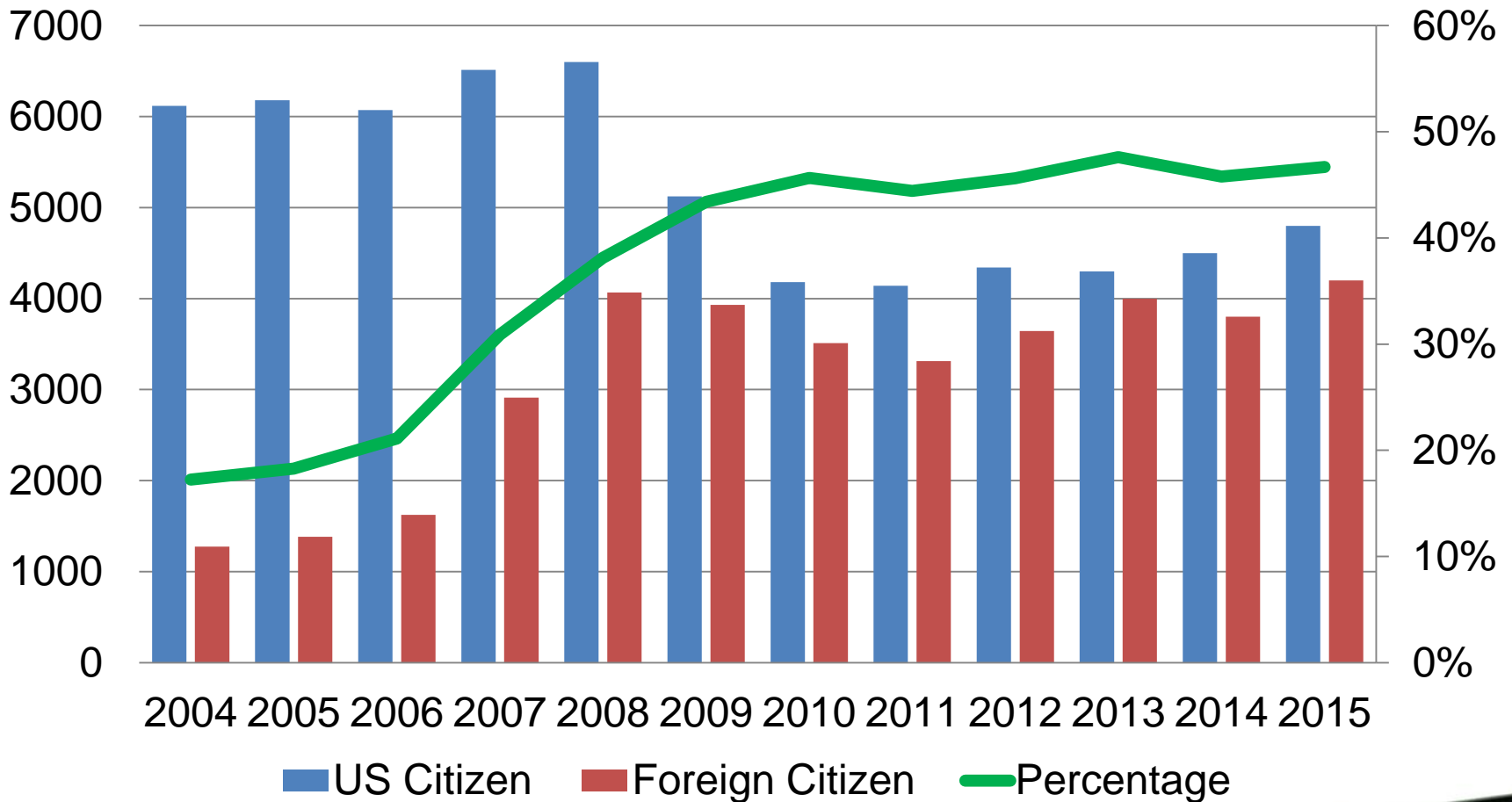
- Yes. UND's forecast model currently predicts future pilots at around a 78% accuracy.
- The two primary variables which determine the number of new pilots in the future are:
  1. Current pilot hiring activity at major airlines
  2. The cost of pilot training



## Historic and New Commercial Pilots (1990-2015)



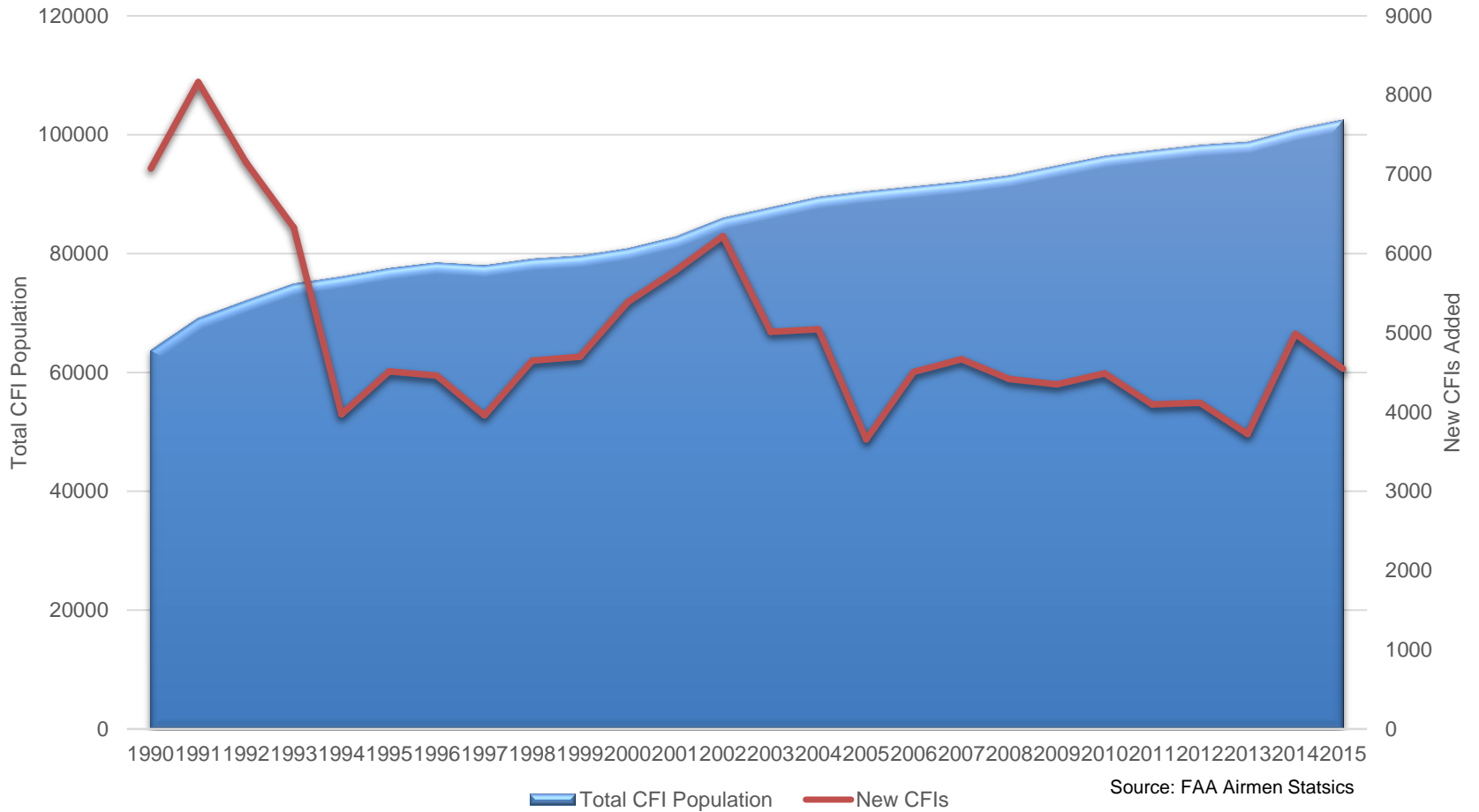
# US and Foreign Citizens Taking the Commercial Airplane FAA Knowledge Exam



Source: FAA ASF 630 Office



## Historic and New CFIs (1990-2015)



# Why use CFIs as the predicted variable for supply?

- On the civilian-side, a Certified Flight Instructor certificate is almost *de facto* required
  - Bases on the PSS 2015, 84% of civilian pilots had a CFI certificate
  - R-ATP and ATP Hour Requirements
- Avoids the confounding issue of foreign students training in the United States
  - In 2004, for almost every 6 US pilots training in America, there was 1 foreign student
  - From 2010 to 2015, that ratio was almost 1 to 1
    - This can be viewed as a positive as this provides flight instructing opportunities for US CFIs



Candidate Predictor	Potential Data Source(s)	Disposition
Starting pay at regional airlines	Airlinepilotcentral.com; UND Contracts Database	No relationship found
High school student interest in aviation careers	National Research Center for College and University Admissions (NRCCUA)	No relationship found
Prestige of being an airline pilot	General Social Survey (GSS); Gallup	No meaningful historical data source found
Job satisfaction of being an airline pilot	General Social Survey (GSS)	No meaningful historical data source found
Cost of flight training	Aircraft Owners and Pilots Association (AOPA); University Aviation Association (UAA)	Relationship found in model
Hiring at major airlines	Future and Active Pilot Advisors (FAPA)	Relationship found in model



# First Predictor:

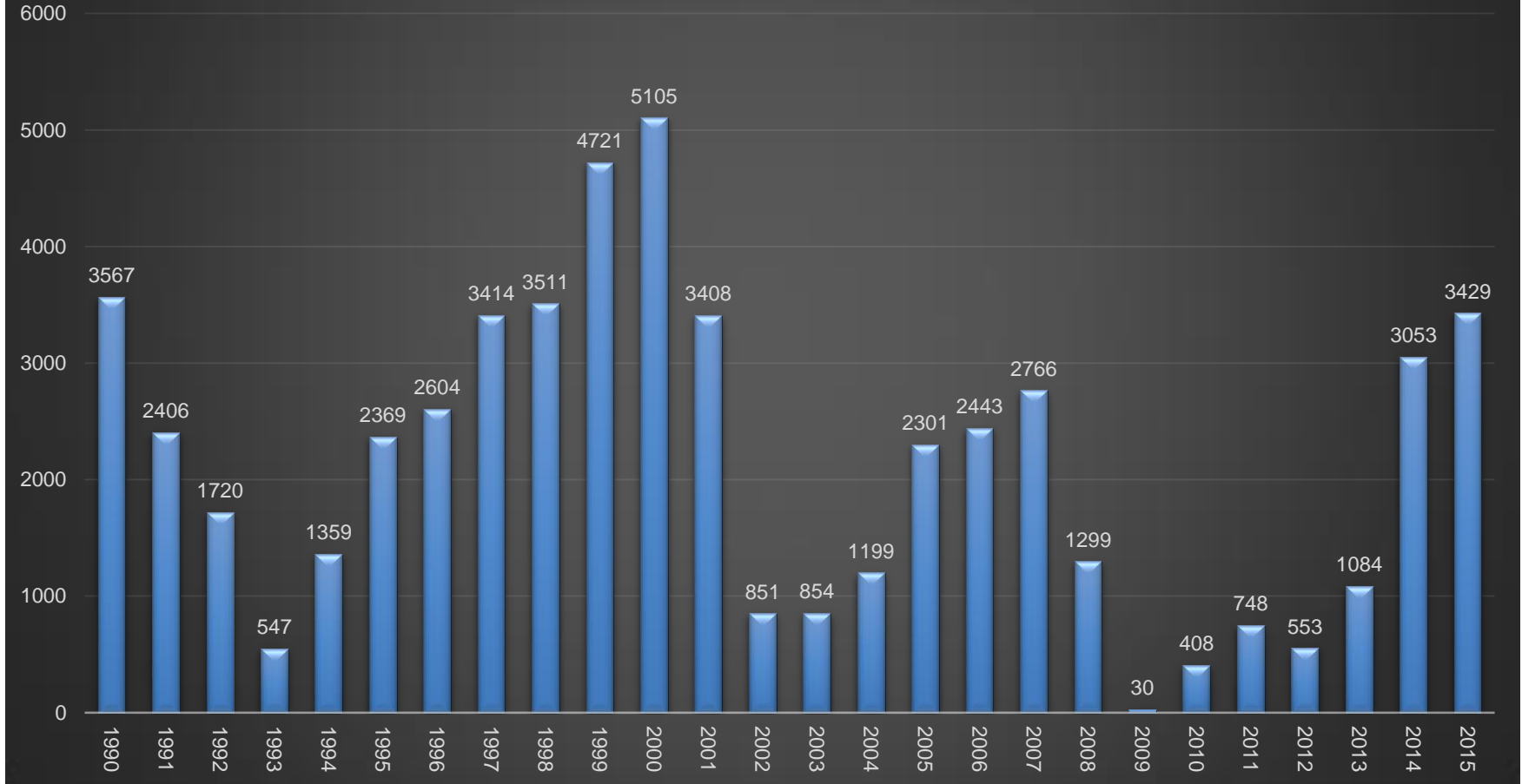
- Hiring at Major Airlines
- Source: [www.fapa.aero](http://www.fapa.aero)
  - Airlines used:
    - United, American, Southwest, Delta, FedEx, Continental, Northwest, JetBlue, UPS, AirTran, America West, US Airways, Alaska, ATA, ABX
    - Consolidation has obviously occurred, but these airlines (or their surviving carriers) were used as the original data source all the way back to 1990





# Historical Major Hiring

(Source: FAPA)



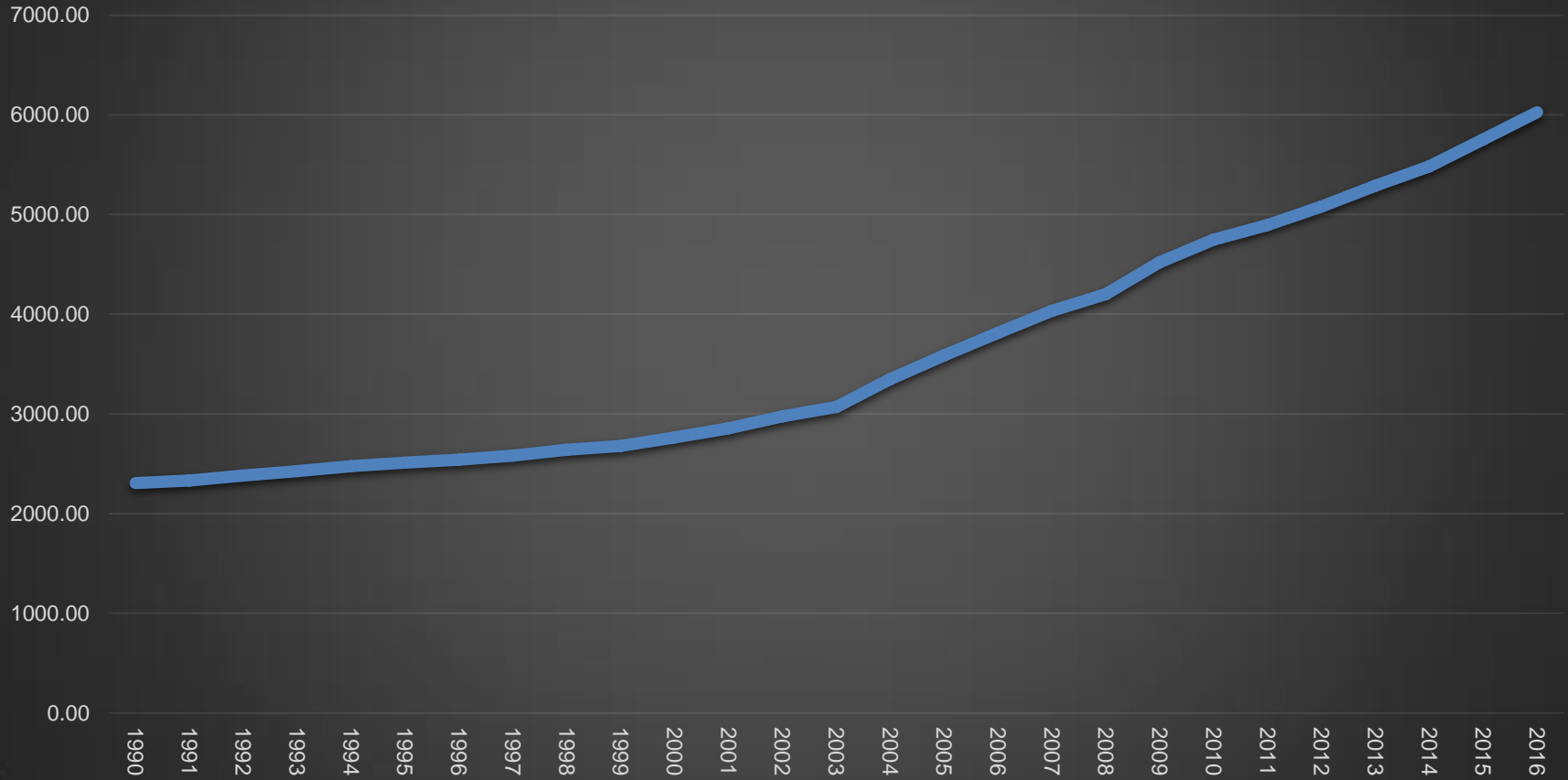
## Second Predictor:

- Change in cost of obtaining Private Pilot Certification adjusted for inflation
- Source: University Aviation Association (UAA)
  - Periods reported 1989, 1994, 1999, 2003, 2008, 2012 and 2016
  - Straight-line interpolation used inter-period and through 2016 (2016 was determined by a collected data from several UAA schools)
  - Not all schools reported in each period, incongruent data removed



# Historical Cost of Private Pilot Certification

(Source: UAA), Inflation Adjusted



# The Supply-Side Model:

$$y = .153x - .338z - .001xz + 4408$$

Where:

$y$  = Future Certified Flight Instructors;

$x$  = Number of pilots hired at major airlines;

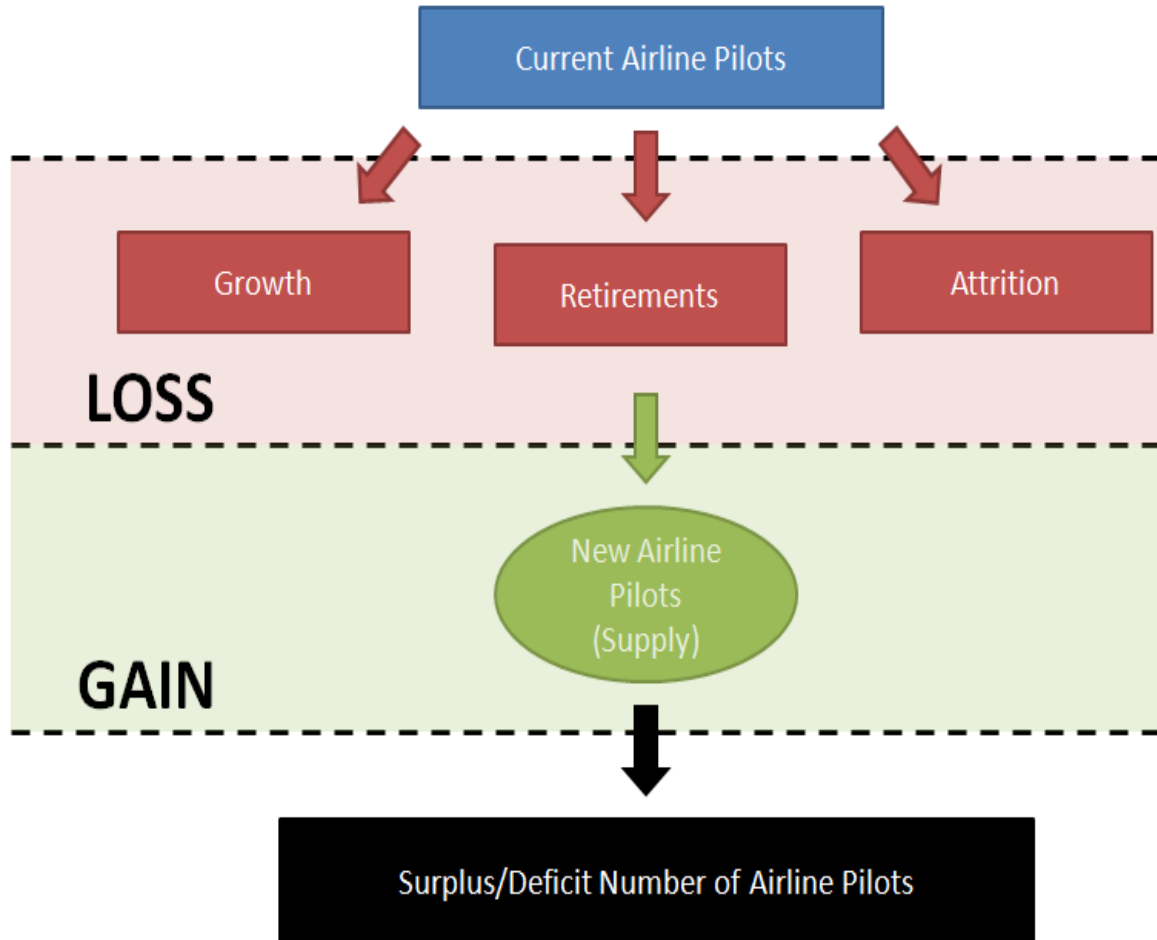
$z$  = Dollar change in cost of obtaining Private Pilot certification  
(adjusted for inflation).

$$\text{Adj. } R^2 = .778; F(3,17) = 24.34, p < .001$$



# Demand Side





	<b>Aircraft</b>	<b>Pilots</b>	<b>Ratio</b>
<b>Alaska</b>	136	1700	12.5
<b>Delta</b>	810	12896	15.92099
<b>United</b>	717	12505	17.44073
<b>American</b>	940	14358	15.27447
<b>Hawaiian</b>	52	627	12.05769
<b>JetBlue</b>	213	3204	15.04225
<b>Southwest</b>	692	8235	11.90029
<b>FedEx</b>	336	4288	12.7619
<b>UPS</b>	237	2538	10.70886
<b>ABX</b>	35	460	13.14286

Overall Industry weighted staffing ratio at the major airlines is 14.89



# Forecast Predictors

## – Future Airline Hiring

- Based upon growth (average of Oliver Wyman, Boeing, Airbus and FAA forecast), retirements and other attrition

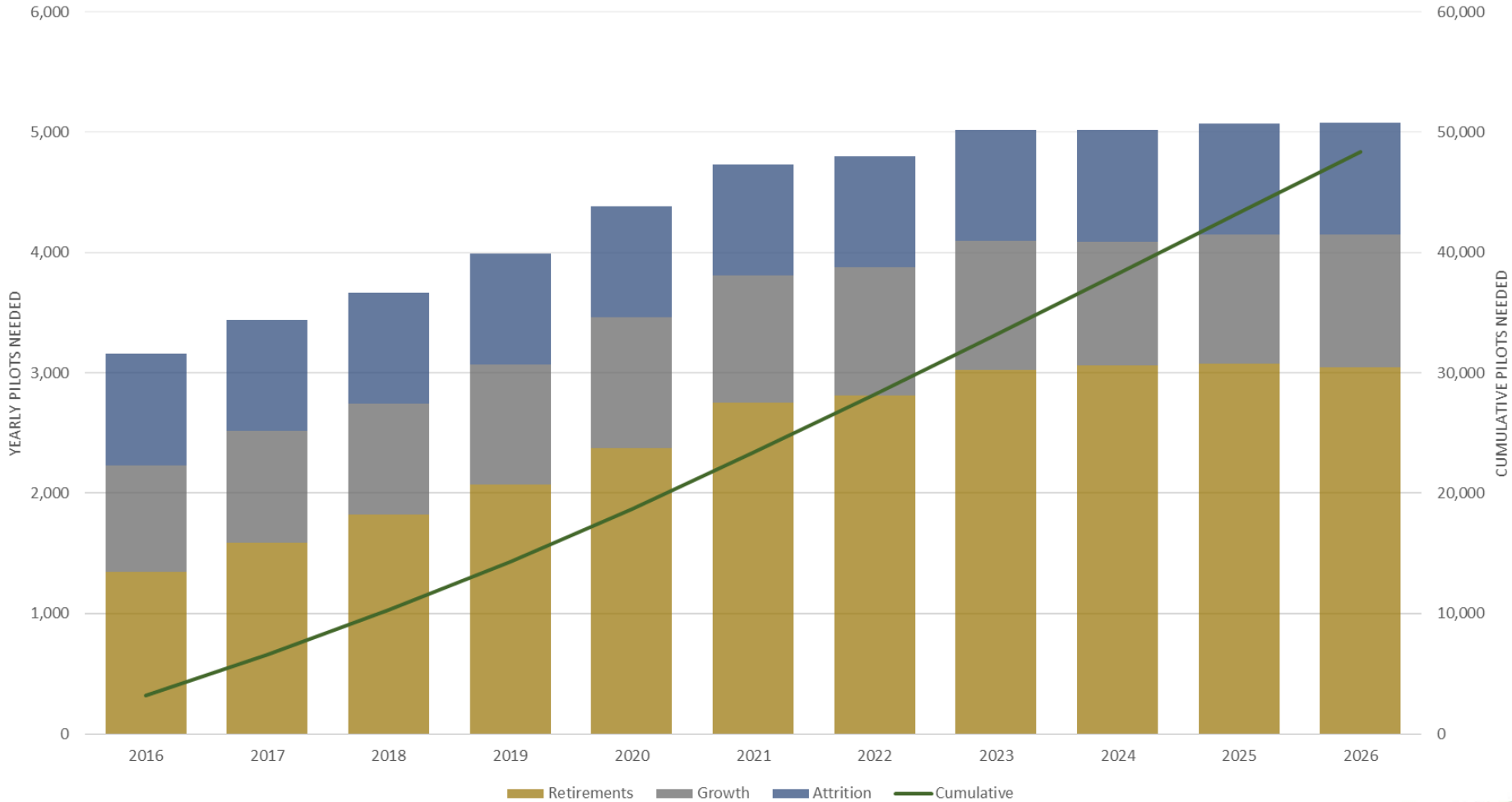
## – Future Initial Flight Cost Changes

- Brown Model
  - MAPE = 37.4



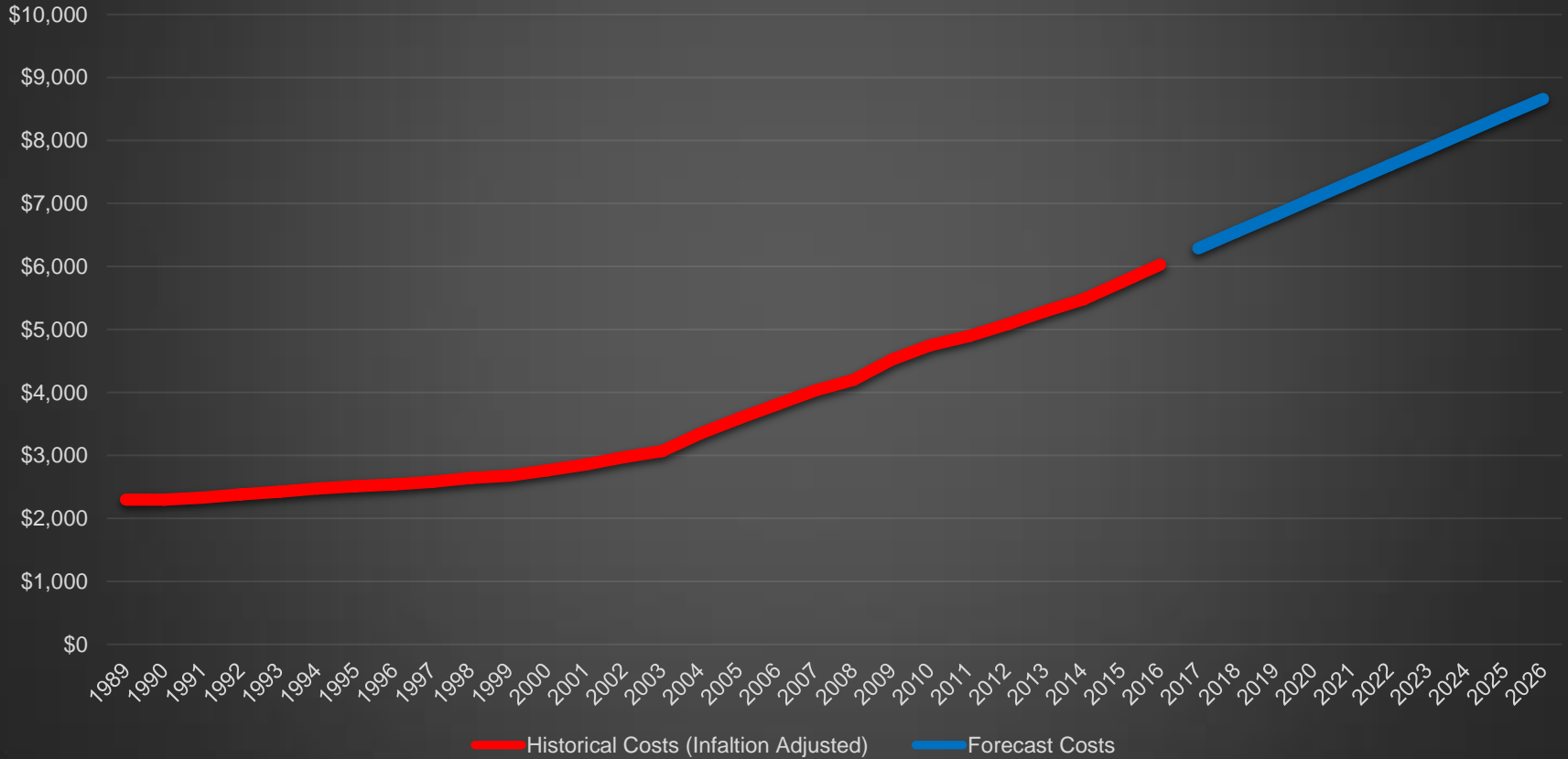


## FORECAST HIRING AT MAJOR AIRLINES



# Historical and Forecast Cost of Initial Flight Training

## Year-Over-Year (Adjusted for Inflation)

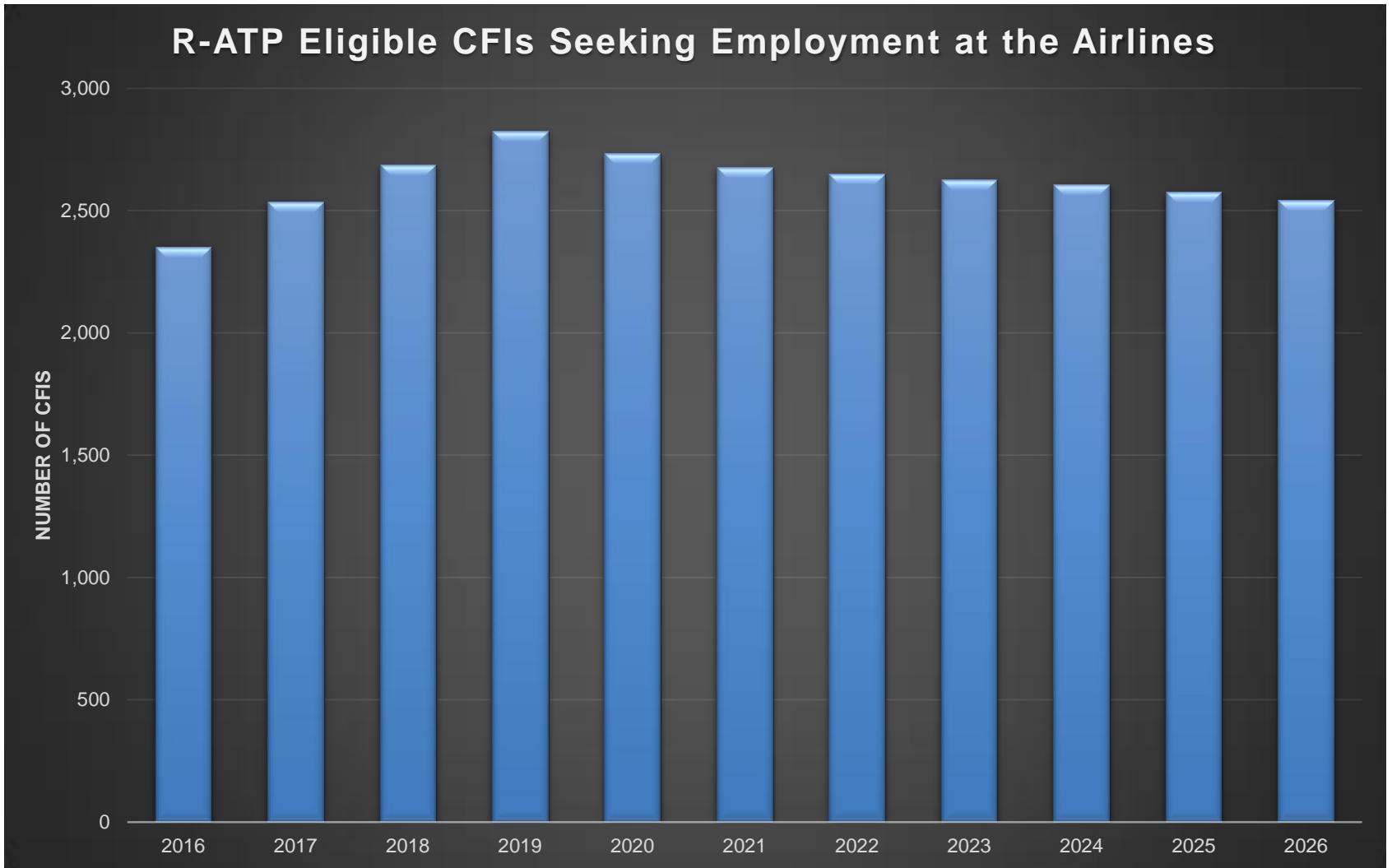


## New CFIs

- Using the supply model, newly trained CFIs will become available to help mitigate supply losses
- Using the data from recent surveys, only 59.22% of CFIs intend to fly for the airlines as a long-term career goal
- After certification, it is assumed that an additional 2 years of flight instruction will be needed to achieve restricted ATP minimums



## R-ATP Eligible CFIs Seeking Employment at the Airlines



# Surplus/Shortage Calculation

– Based upon yearly data:

R=Retirements;

OA =Other Attrition;

G=Pilots Needed for Growth;

M=New Military Pilots;

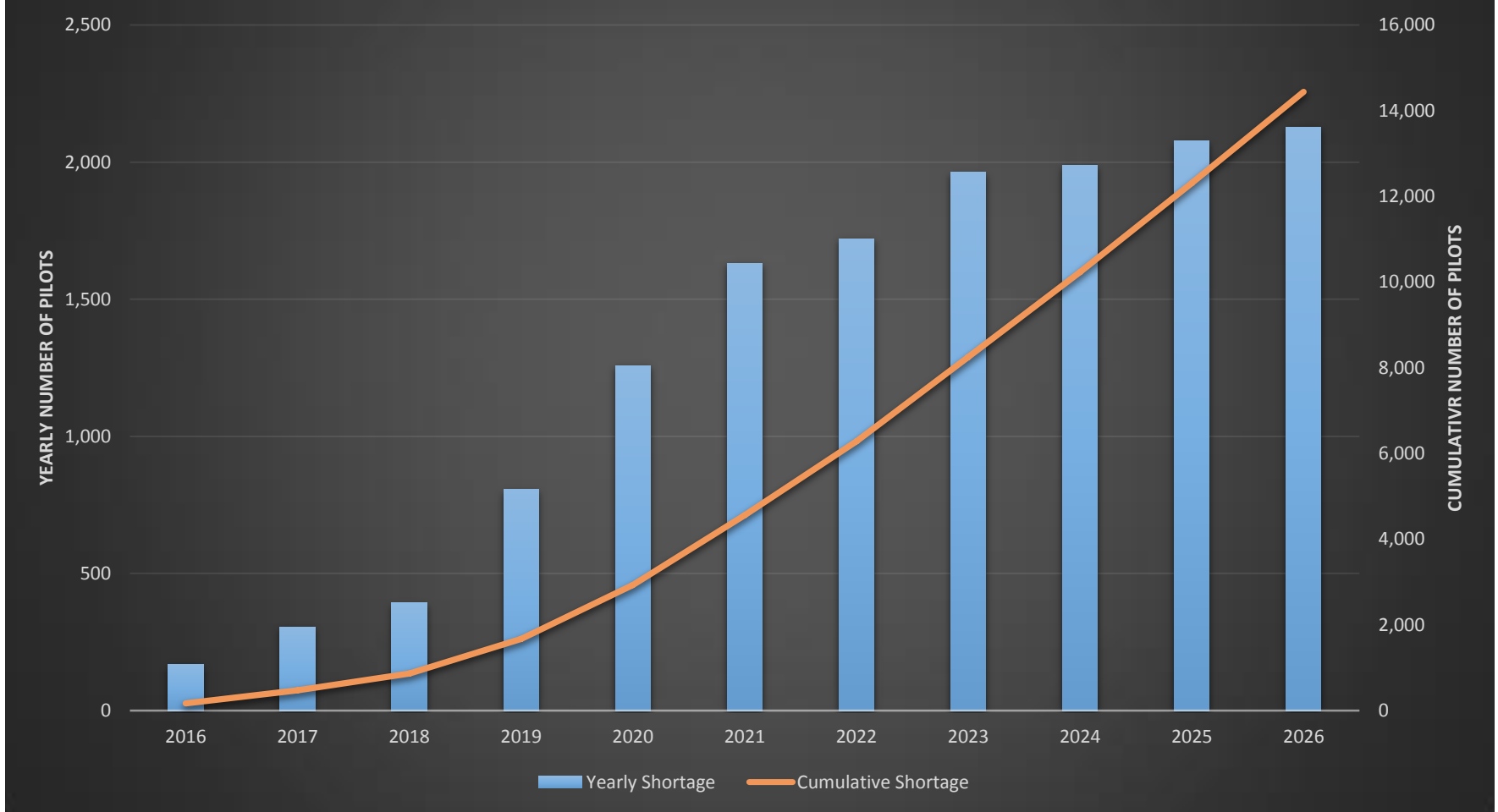
I=Available and Qualified CFIs;

$$\text{Surplus/Shortage} = (R+OA+G) - (M+I)$$

\*Note: Forecast holds all other non-airline Commercial/ATP Pilots Constant



## Forecast Yearly and Cumulative Shortages of Pilots to Staff the US Airline Fleet



## Summary of Forecast 2016-2026

- Deficit of 14,439 pilots
- Considers pilots leaving the industry and pilots joining the industry on a yearly basis
- Holds all other Commercial and ATP pilots constant
  
- Status Quo forecast – Assumes no changes (recession, boom, war, etc.)



# Mitigations

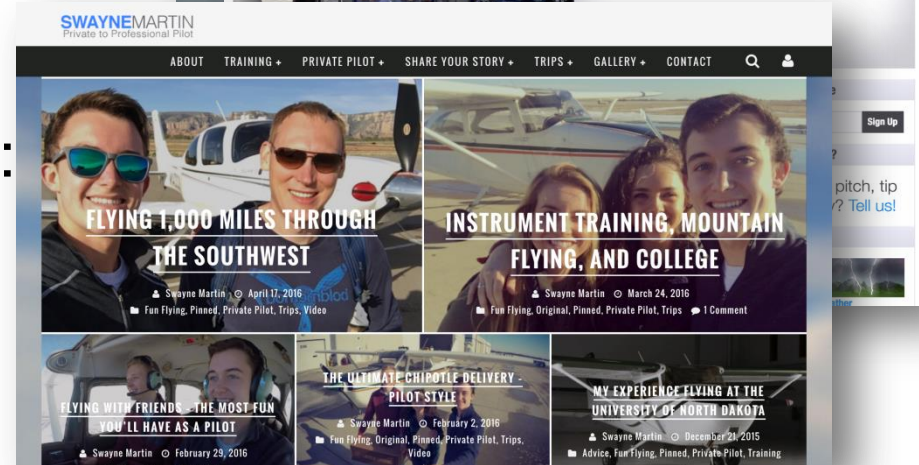
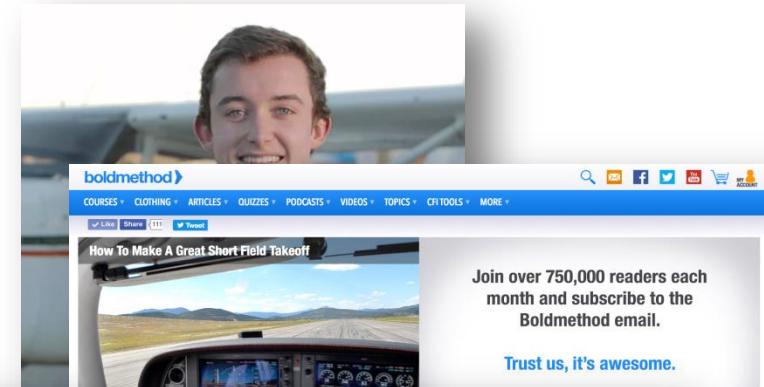
- Should be focused on the two predictor variables
  1. Hiring at Majors
    - Opportunities for career progression (gateway programs, flow, preferential hiring, etc..)
  2. Cost of Pilot Training
    - Industry should look for ways to lessen the cost of training
- Need to attract more young people to the profession
  - Ideally into AABI accredited programs
  - By engaging with our young professional aviators





# Let me introduce...Swayne Martin

- University of North Dakota Student
  - Commercial Aviation Major
- Boldmethod Pilot Training
  - Co-Owner
- Maintains his own blog
  - [www.swaynemartin.com](http://www.swaynemartin.com)
- Maintains a YouTube Channel:
  - 6,000 Subscribers
  - 800,000 Video Views



- By the way...he is only 19 years old



# Evidence of success

## A Year in the Life of a Private Pilot

- Search 'Pilot's License' on YouTube his video is first
- 194,000+ Views
- 580+ Comments
- Created just with GoPro footage, iMovie, and flight experiences he and friends had together.
- Video Goal: Show how fun the license is to have and what you can do with it.



### This Is Why You Should Get Your Pilot's License - A Year In The Life

Swayne Martin

1 year ago • 174,040 views

<http://swaynemartin.com/> It's been one year since I received my private pilot's license. Thanks to the support of friends and family, ...

Verizon 7:23 PM 50%

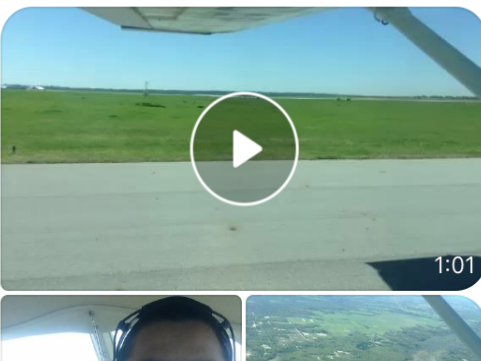
**Filtered Requests**

Jacob Baldrige  
Facebook

I am Jacob baldridge and I am a big fan of your YouTube channel I am 13 years old and you inspired me to get my pilots license at 16 it would be really cool if I got to fly with you. I am a cadet of civil air patrol and one of civil air patrols missions is Aerospace education and each cadet get 5 powered flights and 5 glider flights. I went on my first powered flight yesterday it was so much fun. I hope you read this

Jacob

baldridge




Verizon 12:05 AM 24%

**YCCOHN**

January 17, 2016 at 6:00 PM

yccohen

Hey swayne, just wanted to say Thanks for posting all your amazing adventures of aviation on YouTube. it inspired me to get my PPL no joke so thanks man safe flying.



yccohen Swayne Martin, is why I got my pilots [...]

Thanks for being my inspiration I got my PPL because of you. THANKS

Jose Lozano 1 week ago

awesome videos your my idol I hope to one day become a pilot at a young age just like you

Reply · 1

Swayne Martin 1 second ago

+Jose Lozano That's awesome Jose! I hope you go and do it!

Reply ·


**Brandon Hall**

Studied at ATP Aviation Academy  
Lives in Fort Lauderdale, Florida

10:02AM

Hey, Swayne. I've been following your YouTube videos for sometime now. Your videos helped inspire me to chase my true passion, aviation. I'm just starting out working towards my private license currently with my sights set on my commercial license. Thank you for all you do. Keep the videos coming!

Type a message...

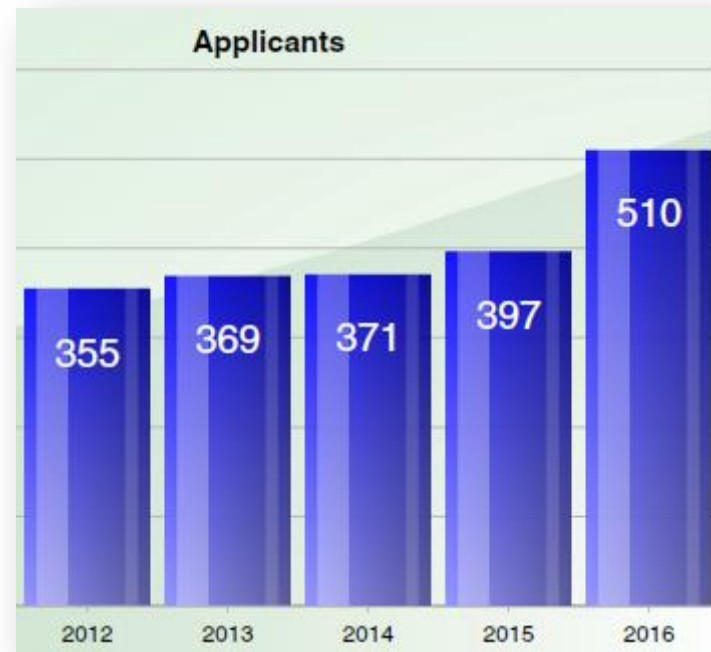


**Kerstin Kerr** 5 months ago · Shared privately

You're videos are out right amazing and beyond inspirational. They have inspired me to actually start my training as a private pilot. I have been on the edge about this for quite a while and I hope to be starting in the next month.

Reply

# New Applicants at UND



# Challenges and Considerations Regarding Pilot Supply

- Student Maturation
  - Young adults mature a lot in the four years at a university
- Flight Instructor Staffing
  - UND has 136 CFIs, like to have 220
    - Only 15 of them have their MEI
- Professionalism/Entitlement Mentality
  - 'Professionalism Stand Down' Fall Flight Instructor Workshop



# Thank you

