

An In-Depth Study of the Pilot Shortage and Its Consequences

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### **Abstract**

In the recent years, the term ‘pilot shortage’ has become a common vocabulary added to the aviation dictionary. Airlines, aviation economists, aviation consultants, and aviation authors have warned of a pilot shortage, that is not looming but one that has already settled in. Many airlines such as Republic have already begun to feel the effect of the pilot shortage, as other airlines are trying to come up with solutions to mitigate it. Despite this, there is controversy on whether the pilot shortage is really true or if it is just another mere myth. This Honors thesis aims to demystify what the pilot shortage is, and explain whether the shortage is true or not.

Furthermore, this thesis will explore what factors caused the pilot shortage and what continues to trigger the development of the shortage. In addition, the thesis will expose the effect that the pilot shortage has had on the airlines, the pilots, and the U.S. economy at large. More importantly, this thesis will analyze the current solutions being put in place to lessen the effects of the pilot shortage, and whether these solutions are effective or not. In conclusion, I will give suggestions and recommendations on solutions that I think will diminish the growing pilot shortage. That is, this thesis seeks to answer the following questions:

- (1) What is the definition and scope of pilot shortage (Is the Pilot Shortage really true)?
- (2) What factors brought about the shortage and continue to engender its progression?
- (3) What are the effects of the pilot shortage on airlines, pilots and on the U.S. economy?
- (4) What solutions have been put in place to mitigate the pilot shortage; are they effective or not?
- (5) What better solutions could be implemented (Conclusion and Recommendations)?

### **Definition and Scope of the Pilot Shortage**

The definition of the pilot shortage largely depends on how one views the pilot shortage. There are mixed views on whether the pilot shortage is really true and factual or whether it is a myth based on perception. For some aviation authors, the pilot shortage is true depending on whether the shortage is referenced to major carriers or to regional airlines. For others, the pilot shortage is not about a decrease in the number of qualified pilots, but rather a refusal of pilots to work at companies (airlines) that offer low wages and minimal benefits (Smith,2016). Yet for others, the pilot shortage is fallacious, and does not exist – due to the large numbers of unemployed pilots, and the even greater number of pilots on furlough (Smith, 2016). These three views provide further insight on the reality (or lack thereof), of the pilot shortage.

To begin with the first view; it is widely thought that the pilot shortage is relative. That is, the shortage is affecting the regional airlines more than it is affecting the legacy carriers (Smith, 2016). This view is based on the thinking that legacy carriers will always have a larger pool of pilots to select from such as the military and the experienced pilots in regional airlines – a pool that is not easily depleted. On the other hand, regional airlines do not have the luxury of choosing from a large pool of competent experienced pilots because their main employee base is graduating pilots seeking to build and gain flying hours. These pilots may not be as many as the already trained and senior level pilots that the legacy carriers have access to and therefore, regional airlines are suffering more. Additionally, over the past few years’ regional airlines have expanded at an extremely high rate to the point that the available pilot pool cannot meet their high expansion rate. According to an article written by Patrick Smith, regional airlines have grown to make up 53% of all domestic flights in the United States – yet the number of graduating pilots has not been growing as fast (Smith, 2016). Due to this imbalance in supply

and demand for graduating pilots, then the regional airlines are feeling the pinch of the pilot shortage more than the legacy carriers.

The second view states that the pilot shortage is mainly driven by the refusal of qualified and experienced pilots to work in airlines offering lower wages. Before the recent raise in pilot pay, most pilots began their carrier with a low starting salary of approximately \$20,000 per annum, mainly at regional airlines. This was accompanied by unattractive health insurance and 401K benefits (Smith, 2016). When compared to the amount of money that pilots put into their training – about \$100,000 in total, then the low starting wages means a slow return on investment. This has forced many aspiring pilots to change careers; triggering the pilot shortage.

Thirdly, the belief by some people that the pilot shortage is fallacious is based on the numbers of pilots who are either unemployed, or on furlough. In the United States, 10.20% of the pilot population was laid off in 2004, in efforts to reduce their operational costs (Aero News Network., 2003). In addition to this, United Airlines and Frontier Airlines in 2008 laid off 950 pilots and 465 pilots respectively – following the tough economic season caused by the recession (Peterson, 2008; Tsai, 2008). More recently, American Airlines in 2010 planned to lay off about 175 pilots and in 2012 announced its plans to lay off 11,000 employees of whom 400 are pilots (Koenig, 2012). Similarly, in other countries pilots have been laid off as well. For example, in 2015, Air France made public its intention of will laying off 2,900 pilots in order to reduce the money spent on pilot wages (Willsher, 2015). On the unemployment side, various platforms such Unemployed Pilot Europe, British Airline Pilots' Association (BALPA) shows registered numbers of pilots with no job amounting to 432, and 500 respectively (Pilot Career News, 2016). These pilots claim that they are facing job completion and are having to wait for long periods of time before even getting an invitation letter for an interview. In economics, this scenario is

defined as frictional unemployment, whereby the unemployed pilots spend a lot of time and energy looking for jobs, yet find none.

Therefore, if there are such many unemployed pilots and many more being laid off, how is it then that there is a pilot shortage? Further statistical data provides insight to answering this question. For instance, Boeing's Pilot and Technician Outlook, compiled in 2016, as part of their Long Term Market Outlook, clearly states that in North America, 112,000 new pilots will be needed between 2016 and 2035. This means that every year, approximately, 590 pilots will be required to meet the growing air transport demand. Statistics from the U.S. Bureau of Labor Statistics, are a bit different as they say that about 1900 to 4500 pilots will be needed per year (GAO, 2014). When these figures are compared to the actual number of pilots pursuing the FAA pilot licenses, we see a conflicting view. In the U.S. as of December 31, 2016, there was a total of 584,362 active airmen certificates held by pilots, of which 157,894 are Airline Transport Pilot Licenses (ATPL) (FAA, 2016).

Furthermore, a total of 9,520 new and original ATPL certificates were issued in the 2016 calendar year (FAA, 2016). Therefore, if only an approximate of 590 to 4500 pilots are needed every year, then there is no pilot shortage because there are 9,520 new holders of an ATPL. In its study of aviation industry forecasts, the GAO concluded that the number of pilots are adequate to meet the demand; but the only difference is that these pilots may be in different facets of aviation such as in the air force, and not necessarily in airlines (GAO, 2014). Such pilots may become available to airlines if the pilots are offered a better deal as compared to where they are currently working. All in all, the pilot shortage depends on what angle one is more inclined to, but there is a general agreeability that the pilot shortage is an occurrence affecting the regional airlines more

compared to the mainline airlines, causing an overall negative desired trend in the aviation industry.

### **Causes of the Pilot Shortage**

Various factors are attributed to have caused the perceived pilot shortage. These include but are not limited to:

- (1) Fewer local U.S students interested in becoming pilots
- (2) More foreign student pilots taking up flight training
- (3) Fewer Certified Flight Instructors (CFI's) interested in becoming airline pilots
- (4) High cost of pilot training
- (5) Low wages for entry level pilots
- (6) More stringent government regulations such as the FAA1500-hour rule
- (7) Retirement of many airlines captains (baby boomers) reaching 65 years
- (8) Shift from hiring military pilots to hiring civilian trained pilots

#### **(1) Fewer local U.S Students interested in becoming pilots.**

Many four-year aviation schools that offered a degree in professional piloting have confessed that fewer students are opting to take up flight training. Universities such as Embry Riddle Aeronautical University and University of North Dakota are examples of universities that have reported this trend (Aviation Week & Space Technology, 2015). Most students expressed a fear of the uncertainty of a career in the aviation industry due to economic factors such as Chapter 11 bankruptcies, mergers, and reorganizations that may easily lead to laying off of pilots. Not to mention the ease with which safety factors such as terrorism, i.e. 9/11, can also result to thousands of jobless pilots. Due to these uncertainties, most students are not willing to spend their time and money pursuing a career that may never fully materialize. Also airline

officials such have mentioned that is not just about fewer students taking up flight training, but more so about a ‘general lack of interest’ in the carrier that is more worrying (Pilot Career News, 2016). That is, many young people are not captivated and fascinated by the aura of being a pilot, as previously was. This is because many more students are now well informed of the realities of the pilot lifestyle such as travel schedules that may keep them away from home for days and weeks. Not to mention other factors such as the inadequate wages offered by regional carriers, and the high cost of training that will be discussed in the upcoming paragraphs.

Statistical data from the Federal Aviation Administration (FAA) supports the reduction in the number of students seeking flight training. From the table below, we observe that between 2007 and 2016, the number of student pilot certificates has reduced from a record high of 66,953 to a low of 36,145 (FAA, 2016). This means that in this 9-year period, there has been a reduction of 30,808 student pilots. This great reduction in student pilots will definitely affect regional carriers as they normally tap into graduating pilot students as their employee base.

**TABLE 22**  
**STUDENT CERTIFICATES ISSUED, BY MONTH:**  
**2007 - 2016**

YEAR	2016*	2015	2014	2013	2012	2011	2010	2009	2008	2007
<b>Total</b>	<b>36,145</b>	<b>47,381</b>	<b>47,407</b>	<b>49,566</b>	<b>54,370</b>	<b>55,298</b>	<b>54,064</b>	<b>54,876</b>	<b>61,194</b>	<b>66,953</b>
January	3,714	3,805	3,882	4,480	4,637	4,319	4,232	4,466	5,628	5,343
February	3,700	3,327	3,154	3,921	4,187	3,841	3,719	4,347	4,752	4,701
March	5,287	3,833	3,451	4,662	4,531	4,762	4,390	4,414	4,944	5,523
April	1,753	3,918	3,881	3,693	4,199	4,201	4,432	4,402	5,061	5,162
May	2,948	3,882	4,159	4,029	4,736	4,590	4,346	4,736	5,363	6,094
June	3,001	4,856	4,614	4,336	5,133	5,190	5,224	5,231	5,956	6,401
July	3,096	4,659	4,833	4,789	5,099	5,286	5,130	5,470	6,265	6,525
August	3,670	4,867	5,104	5,492	5,958	6,506	5,985	5,739	6,127	7,541
September	3,921	4,188	4,195	4,025	4,262	4,862	4,957	4,807	5,163	5,795
October	2,815	3,863	3,963	3,926	4,120	4,238	4,380	4,218	4,977	5,473
November	1,302	3,061	3,133	3,293	3,907	3,881	3,733	3,423	3,554	4,583
December	938	3,122	3,038	2,920	3,602	3,622	3,536	3,623	3,404	3,812

(FAA, 2016)

## **(2) More Foreign Students Taking up Flight Training**

As the number of U.S. students taking up flight training reduces, the opposite is true for foreign students who are flocking to various flight schools in the country. For instance, in 2012, foreign pilot students wrote more than 45% of the FAA Commercial Pilot Written exams (Higgins, J. Lovelace, K. Bjerke, E. Lounsberry, N. Lutte, R. Friedenzohn, D. Pavel, S. Chase, B. Craig, P., 2013). In fact, statistics from the FAA show that, the ratio of pilots with U.S. citizenship to those with foreign citizenship has increased. That is, in 2004 the ratio was 4.80 U.S. students to 1.00 foreign students, and in 2012, the ratio was 1.19 to 1.00, showing that for every 1.00 pilots with U.S. citizenship, there was one foreign pilot (Higgins, J et.al., 2013). These foreign students are mostly company sponsored from regions such as the Asia-Pacific Region and the Gulf Region which are experiencing a greater demand of airline transportation (Aviation Week & Space Technology, 2015).

Once these foreign students graduate from the flight training programs, they return to their countries, and are immediately incorporated as first officers in the airlines that sponsored them. These students may not have to meet the FAA 1500 requirement because their countries are not bound by this public law (Aviation Week & Space Technology, 2015). Because most, if not all of these foreign students do not stay in the U.S., they contribute to the pilot shortage here in the U.S.

## **(3) Fewer CFI's interested in becoming airline pilots**

In addition to the few number of students who take up flight training, those who do, may not really be aiming for a career in the aviation industry. Once these student pilots progress to obtain a CFI license, most of them are content with that. According to a study conducted by the University of North Dakota (UND) in collaboration with other universities, approximately only



53.67% of CFI's are looking into becoming long-term airline pilots (Higgins, J, et.al., 2013). In addition to this, 8.53% of other future pilots who have not yet attained their CFI certificate are also not aiming for airline pilot careers (Higgins, J, et.al., 2013). The bar graph below, shows the decreasing trend clearly.

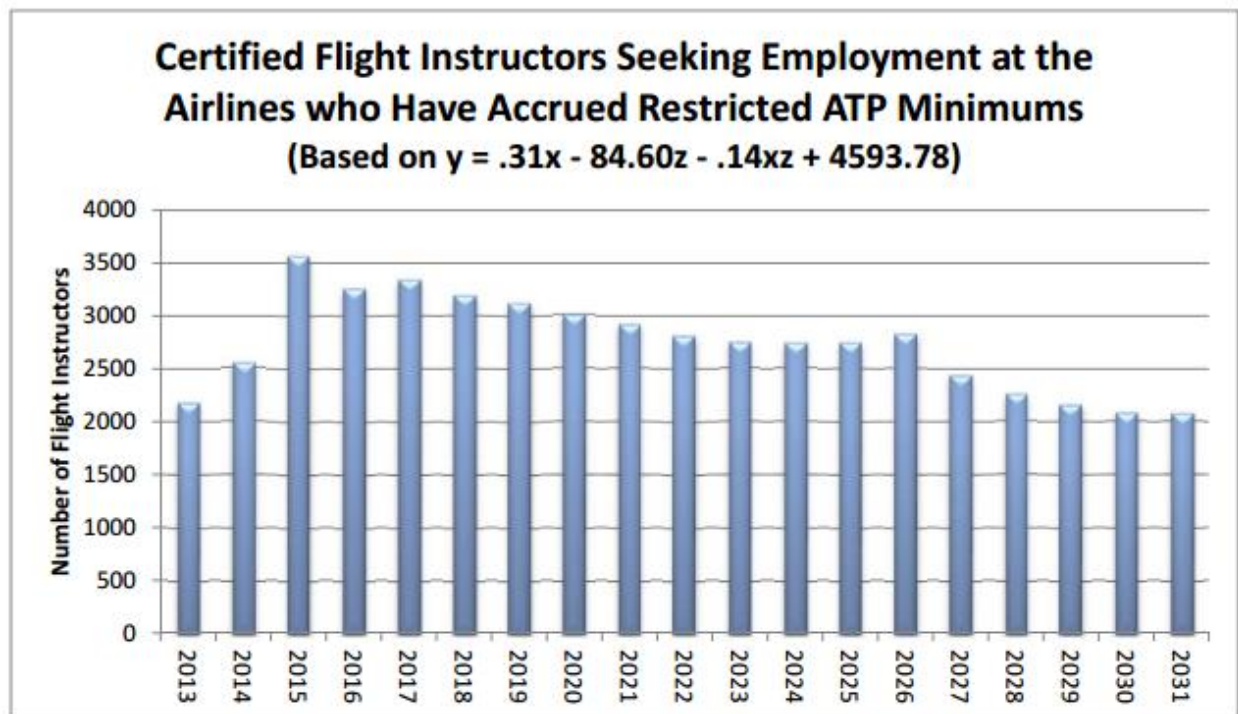


Figure 17. Newly Available Pilots for Airline Hiring.

(Higgins, J, et.al., 2013)

#### (4) High Cost of Pilot Training

One of the biggest and most profound factors discouraging many students and young people from pursuing a career in piloting is the sheer cost of flight training itself, coupled with the great amount of time put in to grasp the required skills. To obtain an ATPL, one may need approximately \$60,000 to \$100,000 to cover the costs of individual flight training (Smith, 2016). This cost does not include the cost of tuition, for those pursuing flight training through universities. This cost of training is still set to increase due to factors such as increase in jet fuel,

among other things. These high costs are discouraging to many students, as they may not have this amount of money readily available.

An article published in Pilot Career News gives further insight into the situation of the High Cost of Pilot Training. According to the article, before the recession, some parents could afford to pay for the flying costs of their children, and banks were also willing to provide substantial loans to cater for these flying loans (Pilot Career News, 2016). However, after the recession, banks were more cautious about the types of investments they supported due to people's default on the loans. One of the investments that the banks were not as willing to support was flight training (Pilot Career News, 2016).

There are many pilot testimonials from pilots who could not go with their flight training due to financial constraints. An example is Mr. Travis Evan who in an interview by Mashable expressed his dismay in that he had to stop flight training because the high cost of the training was too much to bear (Pilot Career News, 2016). Mr. Evan is just one in the many student pilots who quit flight training. In fact, eight in ten student pilots (80%) give up and quit flight training due to various reasons, one of them being the high cost of training (Beckett, 2016). That is, of the students who actually take up pilot training, not all of them are guaranteed to graduate. For instance, schools such as Utah Valley University and Embry – Riddle Aeronautical University experienced only a 7% and 2.3% graduation rate for students enrolled in their aviation departments (Larson, 2015). To further expound, of the 300 to 350 students who enrolled in Utah's aviation program, only 7% graduated (Larson, 2015). Therefore, since the high cost of pilot training keeps many people at bay, thereby contributing to the development of the pilot shortage.

#### **(5) Low Wages for Entry Level Pilots.**

In addition to the above mentioned reasons that are discouraging potential students from pursuing flight training, another major factor is the low starting wages offered to first officers especially at regional airlines. For a long time, starting salaries at regional airlines were about \$20,000 per year, compared to starting salaries at major carriers which are about \$60,000 to \$80,000 per year (Larson, 2015). When this low starting wages are compared to the cost of flight training, it is easy to see why most students do not take up flight training. That is, a student spends about \$100,000 to train, only to work at companies offering starting wages of \$20,000. Most students, over 78% of them do a cost benefit analysis, and soon realize that the high risk of training does not necessarily produce a high return due to the low regional airline wages, low retention pay and inadequate benefits (Higgins, J, et al., 2013).

Since most people are naturally risk averse, they refrain from such high risks. The low wages have also discouraged many qualified pilots from leaving their jobs in the military and in CFI positions to join airlines. John Lewinski reports in the Atlantic that the CFI's instructing at a school in Santa Monica are not willing to leave their positions because they make more money as CFI's than if they were at a regional airline (Lewinski, 2014). Therefore, the regionals may as well be facing a shortage of pilots not because there are no qualified pilots, but because the qualified pilots would make more money working in other facets of the industry.

On the brighter side, most regional airlines have increased their starting salaries and even offer signing bonuses in a bid to attract more pilots. For example, Endeavor Air, which is Delta's subsidiary increased its starting salaries by 20% to \$60,000 in addition to training bonuses and retention bonuses amounting to \$30,000 per year (Templeton, 2016, Larson, 2015), Similarly in the fall of 2016, PSA, Piedmont and Envoy which are regional airlines wholly owned by American Airlines increased their starting wages to \$60,000, due to in-part signing bonuses of

about \$20,000 (Templeton, 2016). In addition to the performance bonuses, and signing bonuses, the airlines are also considering other profit sharing deals.

Also, in the long term, pilots who stick with the job and rise through seniority are well-compensated. Such senior pilots may make up to \$300,000 per year – considering the work only a few days of the month (Larson, 2015). In fact, foreign airlines such as China are also offering qualified expatriate pilots high salaries of over \$200,000 untaxed, if they are willing to migrate and work for them. Therefore, there is still some light at the end of the tunnel (Larson, 2015).

**(6) More stringent government Regulations such as the FAA1500-hour rule.**

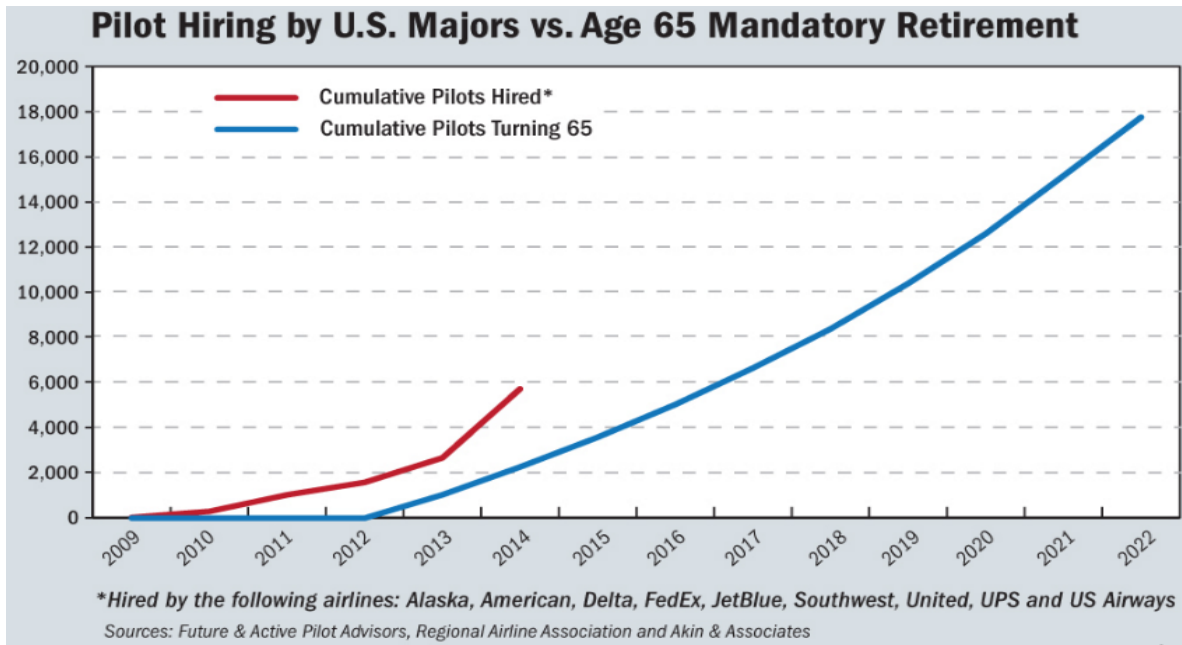
Following the great number of accidents that occurred in the 2000's, and especially the Colgan Air Crash of 2009, the United States Congress began to review pilot requirement and airline hiring practices. The culmination of this review was the passing of Public Law 111-216 by Congress which states that as of 2013, a pilot of a part 121 air carrier must hold an Airline Transport Pilot Certificate (Higgins, J, et al., 2013). The purpose of this mandate was to increase the qualifications needed before a pilot was considered ready to fly passengers.

Although there is controversy over the efficacy of this rule, the Congressmen hoped that it would reduce the number of air accidents (Higgins, J, et al., 2013). To get an ATPL, a pilot must log in 1,500 flight hours. Prior to the implementation of Public Law 111-216, a pilot was eligible to fly for a commercial airline straight out of flight school with minimum flight hours. The implementation of the 1500-hour rule therefore increased the requirements needed, making it more challenging for pilots to qualify for airline positions (Higgins, J, et al., 2013). Furthermore, the increased requirement means that it will take longer for pilots to be eligible to fill up the jobs at airlines, thereby creating a momentary shortage.

**(7) Retirement of many airlines captains (baby boomers) reaching 65 years.**

Across many industries, baby boomers are retiring as they approach the mandatory retirement age for their respective jobs. The aviation industry has also not been left out of the wave of retirement as many captains are reaching 65 years which is the retirement age set by the FAA, under the provisions of the 2007 Fair Treatment of Experienced Pilot Act, that raised the retirement age from 60 to 65 years (Federal Aviation Administration Act, 2012). Statistical data provided by a Deseret News publication states that in the next few years, American Airlines, Delta, and Southwest will lose 61%, 47%, and 40% of its aging pilots respectively (Larson, 2015). Further data from research done by University of Dakota and other universities reveal that over the next 20 years, 45,000 pilots will retire (Higgins, J, et al., 2013). This rate of retirement will be detrimental because there are only 18,000 pilots currently serving at regional airlines (Higgins, J, et al., 2013). Since major carriers hire pilots from regional airlines, then there will be a shortage of approximately 27,000 pilots (i.e. 45000 – 18000). None the less, this does not take into consideration the number of pilots who are about to join the regionals and work on increasing their flight hours to be ready for hiring by major airlines in the next 20 years.

In addition to retirement, other factors may lead to a decrease in the already available pilot pool. These factors include furlough, early retirement, dismissal, and more importantly, loss of the FAA Medical Certification (Higgins, J, et al., 2013). These factors combined will contribute to the buildup of the pilot shortage. A line graph from Aviation Week (see Figure 1) sourced out of gives a mental picture of the retirement (Croft, 2015).



*Figure 1. Pilot Hiring by U.S. Majors vs. Age 65 Mandatory Retirement. This figure shows the difference between the number of pilots being hired by major airlines compared to those retiring as they approach 65 years. Adapted from an Aviation Week article written by Croft, J on February 3, 2015.*

### **(8) Shift from hiring military pilots to hiring civilian trained pilots**

In the past decades, most airlines preferred to hire pilots from the military – specifically those who were retiring. However, in the recent years, the number of retiring military pilots has significantly reduced, forcing airlines to begin recruiting more civilian-trained pilots (Aviation Week & Space Technology, 2015). Furthermore, many military pilots are choosing to stay in the military longer than they did previously. Of the civilian trained pilots, many carriers lean towards hiring pilots graduating from universities with 4-year degree programs in professional piloting (Aviation Week & Space Technology, 2015). However, just like the reducing numbers of military pilots, the number of pilots from such universities are also decreasing, due to many factors, as discussed in the paragraphs above. This leaves airlines in a gray area where they are competing for the few civilian trained pilots.

**Effect of Pilot Shortage on Airlines, Communities and the U.S. Economy at large**

Many airlines, especially regional airlines have started to feel the negative consequences of the Pilot Shortage. Regional airlines which are not able to fully staff their planes with pilots have been forced to park their aircraft, and greatly reduce their schedules, leading to flight cancellations (Aviation week & space technology, 2015). An example of an airline that has been greatly affected by the shortage is Republic Airways, a former regional airline based out of Indianapolis. Due to the inability of Republic to hire enough pilots, and also due to its poor pilot labor relations, the airline had to ground most of its aircraft, leading to great operating losses. This scenario resulted in Republic filing for Chapter 11 bankruptcy in order to reconstruct itself. Furthermore, since Republic was contracted by major carriers such as Delta Air Lines, United Airlines and American Airlines to service their short haul routes, the airline was unable to do so leading to many flight cancellations and big losses for these major carriers (Miller, 2015). Therefore, although major airlines may not directly face detrimental effects of the shortage as regional airlines do, they (major carriers) are in one way or another affected because of the contracts they hold with the regional airlines (Miller, 2015).

Great Lakes Airlines, a regional airline based in Cheyenne Wyoming has also been affected by the Pilot Shortage. Prior the legislation of the 1500-hour rule, Great Lakes was a Part 121 operation that flew the Beechcraft 1900 planes, which are 19 passenger turboprops (Miller, 2015). After the 1500-hour rule was passed by Congress, Great Lakes was forced to involuntarily layoff 30 of its pilots who had not yet built the 1500 hours required flight time (Chilton, 2013). At the same time, major airlines were quickly hiring pilots from Great Lakes and other regional airlines who had accumulated 1500 flight hours to also meet the newly passed law. This created a shortage of pilots for Great Lakes which eventually forced the airline to not only reduce the number of routes it flew to but to change its whole business model. That is, Great Lakes became

a private Part 135 company in order to hire pilots with less than 1500 hours. In order to become a Part 135 operation, Great Lakes removed 10 of the 19 passenger seats in its Beechcraft 1900 planes (Chilton, 2013). The less number of seats translated into fewer passengers and therefore less money coming in for the airline. As of 2015, Great Lakes only had 67 pilots yet it needed to have 90 pilots. The shortage continues to affect the airline as was seen when the airline defaulted in its \$27.5 million loan borrowed from Callidus Capital Corporation (Mooney, 2015).

In addition to affecting airlines, the Pilot Shortage has greatly affected many communities especially small rural communities being served by regional airlines. In order for airlines to serve smaller communities, most of them receive an Essential Air Service (EAS) subsidy, to help the airlines provide service to these routes that would be otherwise non-profitable for the airlines. Most of the recipients of the EAS are regional airlines such as Great Lakes and Cape Air, among others. Through the EAS, Great Lakes used to serve four small communities in Wyoming namely Cheyenne, Riverton, Sheridan and Worland (Chilton, 2013). However, due to the losses experienced by Great Lakes, that have been earlier discussed in this paper, the airline had to retreat from serving Sheridan, in April 2015. This left the small remote town with no air service. Similarly, Cape Air, service to the small town of Kirksville through the EAS program is currently under due to the recent proposal by President Trump to end the funding of the whole Essential Air Service Program (Brown, 2017).

The reduction of routes and schedules also has a greater effect to the economy at large. For instance, if the Essential Air Service to Kirksville is eliminated, 11 of the airports' full time employees will lose their jobs (Brown, 2017). Furthermore, the U.S. economy will lose revenue since the airport at Kirksville earns an approximate of \$6.1 million every year (Brown, 2017). On a larger scale, the airline industry in the U.S. as of November 2016 contributed \$1.6 trillion to



the total economic output, which translated to about 5% of the country's Gross Domestic Product (GDP). Moreover, the industry supports approximately 11 million jobs. Not to mention that civil aircraft manufacturing was one of the country's biggest export contributing \$59.9 billion of U.S. trade. Therefore, the shortage of pilots puts much at stake. If the shortage continues to develop at alarming rates, the economy may lose a share of the GDP from aviation.

### **Potential Solutions**

In order to prevent the advancement of the Pilot Shortage, various airlines have taken the initiative to brainstorm and implement solutions such as but not limited to; Increasing the wages for entry level pilots, setting up Gateway programs or cadet training programs, modeling a clear Career path for pilots, Offering Scholarship and Mentorship Opportunities.

#### **(A) Increasing the wages for entry level pilots**

One way that could be used to attract more students to take up flight training, and to attract more qualified pilots to want airline careers would be to increase the starting wages of entry level pilots (Smith, 2016). This can be done in many ways such as offering signing bonuses, increasing allowances, offering good health insurance coverage, having reasonable 401-k, and also tapping into profit-sharing schemes. As has been discussed earlier, already many regional airlines have raised their starting wages from \$20,000 to approximately \$60,000 (Templeton, 2016). This will encourage many pilots because the Risk Vs Return Tradeoff would not be as high. Therefore, pilots will be able to take care of the students loans incurred during training more adequately. This solution may however not be 100% effective as it only addresses the problem for those who are already pilots seeking airline careers. However, the true need belies the actual number of students training to be future pilots. Furthermore, providing signing bonuses may only be temporary as it does not support a sound business structure (Miller, 2015).

**(B) Setting Up Gateway Programs or Cadet Training Programs**

Therefore, to offer a solution that addresses the need and not merely the problem, airlines must tap into the root. One way of doing this is to offer Gateway Programs, otherwise known as Cadet Training Programs or Ab-Initio Programs. In these programs, airlines select young candidates with little to no flight experience and train them from the ground-up until they become first officers (Smith,2016). In exchange for this training, the candidates sign a contract to work for the sponsoring airline for a certain number of years in order to repay the cost of their training. An example of such a program in the U.S. is the Jet Blue Gateway Programs such as the Gateway select programs that select approximately 24 candidates in each intake, with the qualities of becoming a pilot and train them until they are eligible to fly jetliners (Pilot Career News, 2017). Once the trainees complete the 4-year Gateway Program, they receive a contingent job offer at Jet Blue (Pilot Career News, 2017). In this way, the high training costs to become a pilot are offset, allowing the pilots to repay the costs as they work.

Similarly, American Airlines has set up its own training program known as the Envoy Cadet Program that offers various benefits such as tuition reimbursement, mentorship and internships with American Airlines (American Airlines Group, 2016). This not only eases the cost of training, but also helps pilot students gain real word experience through the internships offered at the airline. In its cadet program, American has partnered with over 40 institutions, and our very own Oklahoma State University is part of American Airlines' Envoy Cadet Program (American Airlines Group, 2016).

In addition to this, there are other ab-initio programs in foreign countries such as in the United Kingdom where the British Airways Future Pilot Program (FPP) selects candidates for flight training. Successful candidates then pay back British Airways with equal monthly installments over the first seven years of their employment at the airline (British Airways

Careers, 2017). For this program, British Airways has partnered with CTC Aviation, Flight Training Europe and CAE Oxford Aviation Academy (British Airways Careers, 2017).

Similarly, Virgin Atlantic has partnered with CTC Aviation to offer the CTC Wings Virgin Atlantic Future Flyers Programme that trains pilot until they become first officers in the Airline (Virgin Atlantic, 2017).

### **(C) Setting up School-to-Job Bridge Agreements**

In addition to the Gateway programs, another way to help student pilots build their hours and progress to working in an airline is through the School-to-Job Bridge Agreements, such as the SkyWest- UVU Pilot Cadet Program. In this program, SkyWest Airlines has partnered with Utah Valley University (UVU) to offer a bridge program where graduates of UVU's pilot program with certain qualifications are hired to work in SkyWest Airlines (Ballard, 2013). For this bridge program, the qualifications are to graduate with a good grade point average, having attained an FAA CFI license (Ballard, 2013). In these bridge programs, the assurance that one may get a job if they work hard in school motivates the students to concentrate on their studies knowing that great opportunities await them in the future.

### **Conclusion and Recommendations**

In conclusion, the pilot shortage presents a chance for airlines and the aviation industry as a whole to analyze its business model – and especially its methods of compensating pilots, who are working on the frontline of airlines. Although there is no direct answer as to whether the pilot shortage is real or whether it is looming, it has been observed that the number of young people choosing piloting as a career has dwindled over the decades. The solutions that airlines and others in top-level management implement will determine if the shortage scenario can be dealt with fast enough to mitigate the effects that are already being felt by the industry. Furthermore,

aspiring pilots to should take advantage of the current time when pilot careers are booming and in high demand world-over.

## References

- Aero News Network. (2003, Nov 12). Current airline pilot furlough stats. Retrieved on March 1, 2017 from <http://www.aero-news.net/index.cfm?do=main.textpost&id=3fcc4dea-2890-4c9b-a402-ae612ff30be>
- American Airlines Group. (2016, Jan 21). Cadet program takes pilots from classroom to cockpit. Retrieved on March 1, 2017 from <https://www.envoyair.com/2016/01/21/cadet-program-takes-pilots-from-classroom-to-cockpit/>
- Aviation Week & Space Technology (2015, Feb 16) The coming U.S. pilot shortage is real. Retrieved on March 1, 2017 from <http://aviationweek.com/commercial-aviation/coming-us-pilot-shortage-real>
- Ballard, H. (2013, Sept 29). UVU partners with SkyWest airlines. Retrieved on March 1, 2017 from [http://www.heraldextra.com/news/local/uvu-partners-with-skywest-airlines/article\\_28f3d9c3-b78a-543b-a00b-76c379a2a678.html](http://www.heraldextra.com/news/local/uvu-partners-with-skywest-airlines/article_28f3d9c3-b78a-543b-a00b-76c379a2a678.html)
- British Airways Careers. 2017. Future Pilot – Reach Higher. British Airways. Retrieved on March 1, 2017 from <https://jobs.ba.com/jobs/futurepilot/>
- Brown, D. (2017, Mar 16). Cape Air could leave Kirksville if essential air service funding eliminated. Kirksville Daily Express. Retrieved on March 1, 2017 from <http://www.kirksvilledailyexpress.com/news/20170316/cape-air-could-leave-kirksville-if-essential-air-service-funding-eliminated>
- Boeing. (2016, July 25). Boeing forecasts nearly 1.5 million pilots and technicians needed by 2035. Boeing Mediaroom. Retrieved on March 1, 2017 from

<http://boeing.mediaroom.com/2016-07-25-Boeing-Forecasts-Nearly-1-5-Million-Pilots-and-Technicians-Needed-by-2035>

Croft, J. (2015, Feb 3). U.S. carriers face shrinking pool of pilots. Aviation Week and Space Technology. Retrieved on March 1, 2017 from <http://aviationweek.com/commercial-aviation/us-carriers-face-shrinking-pool-pilots>

Chilton, J. (2013, Aug 17). Great Lakes Airlines faces shortage of pilots. The Casper Star Tribune. Retrieved on March 1, 2017 from [http://trib.com/business/great-lakes-airlines-faces-shortage-of-pilots/article\\_88b45803-0775-58a7-a45a-698fca04c7ca.html](http://trib.com/business/great-lakes-airlines-faces-shortage-of-pilots/article_88b45803-0775-58a7-a45a-698fca04c7ca.html)

Federal Aviation Administration. (2012 Aug 8). Fair treatment of experienced pilots act (The Age 65 Law). Retrieved on March 1, 2017 from [https://www.faa.gov/other\\_visit/aviation\\_industry/airline\\_operators/airline\\_safety/info/all\\_infos/media/age65\\_qa.pdf](https://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/info/all_infos/media/age65_qa.pdf)

Federal Aviation Administration (FAA). (2016) U.S. Civil Airmen Statistics. Annual Statistics – 2016 Active Civil Airmen Statistics. Retrieved on March 1, 2017 from [https://www.faa.gov/data\\_research/aviation\\_data\\_statistics/civil\\_airmen\\_statistics/](https://www.faa.gov/data_research/aviation_data_statistics/civil_airmen_statistics/)

Federal Aviation Administration. (2016, Nov). The economic impact of civil aviation on the U.S. economy. Retrieved on March 1, 2017 from [https://www.faa.gov/air\\_traffic/publications/media/2016-economic-impact-report\\_FINAL.pdf](https://www.faa.gov/air_traffic/publications/media/2016-economic-impact-report_FINAL.pdf)

Jamie, B. (2016, Nov 22). I Quit. Aviation News. Retrieved on March 1, 2017 from <https://generalaviationnews.com/2016/11/22/i-quit/>

- Koenig, D. (2012, June 22). American Airlines offers to drop plans to lay off pilots. Retrieved on March 1, 2017 from <http://kcby.com/news/local/american-airlines-offers-to-drop-plans-to-lay-off-pilots-11-13-2015-154318112>
- Larson, C. (2016, Sept 20). Potential Pilot Shortage Means Opportunity for students. Deserey News. Retrieved on March 1, 2017 from <http://www.deseretnews.com/article/865637227/Potential-pilot-shortage-means-opportunity-for-students.html>
- Lewinski, S. J. (2014, July 14). Turbulence ahead: the coming pilot shortage and how it came to be. The Atlantic. Retrieved on March 1, 2017 from <https://www.theatlantic.com/business/archive/2014/07/turbulence-ahead-the-looming-pilot-shortage-and-its-decades-long-history/374171/>
- Live Statistics. (2015) Unemployed pilots europe. Retrieved on March 1, 2017 from [http://www.unemployedpilots.eu/?page\\_id=1404](http://www.unemployedpilots.eu/?page_id=1404)
- Miller, S. (2015, Sept 02). Brace for impact: the regional pilot shortage is here. Retrieved on March 1, 2017 from <https://airwaysmag.com/uncategorized/brace-for-impact-the-regional-pilot-shortage-is-here/>
- Miller, S. (2015, July 29). The regional pilot shortage is real for republic airways international inc. Retrieved on March 7, 2017 from <https://airwaysmag.com/airlines/the-regional-pilot-shortage-is-real-for-republic-airways/>
- Mooney, K. (2015, Sept 25). Reports: great lakes aviation at risk of insolvency due to loan default. KNEB Your Trusted Voice. Retrieved on March 7, 2017 from

<http://kneb.com/regional-news/great-lakes-aviation-at-risk-of-insolvency-due-to-loan-default/>

Peterson, K. (2008, June 23). United Airlines to lay off 950 pilots. Reuters. Retrieved on March 1, 2017 from <http://www.reuters.com/article/us-ual-pilots-idUSWEN639920080624>

Pilot Career News. (2016, March 27). JetBlue launches 'gateway' pilot training programme. Retrieved on March 1, 2017 from <https://www.pilotcareernews.com/jetblue-launches-gateway-pilot-training-programme/>

Pilot Career News. (2016, Aug 11). The truth about the global pilot shortage. Retrieved on March 1, 2017 from <https://www.pilotcareernews.com/truth-global-pilot-shortage/>

Smith, P. (2016, March 1). Fact and fallacy of the "pilot shortage". Ask the Pilot. Aerophilia Enterprises. Retrieved on March 1, 2017 from <http://www.askthepilot.com/pilot-shortage/>

Stewart, D.R. (2010, Jan 23). American Airlines may lay off pilots. Retrieved on March 1, 2017 from [http://newsok.com/american-airlines-may-lay-off-pilots/article/3434157?custom\\_click=rss](http://newsok.com/american-airlines-may-lay-off-pilots/article/3434157?custom_click=rss)

Tsai, C. (2008, Jul 7). United, Frontier to lay off 606 in Colorado. NewsOK. Retrieved on March 1, 2017 from <http://newsok.com/article/3267108>

Higgins, J. Lovelace, K. Bjerke, E. Lounsberry, N. Lutte, R. Friedenzohn, D. Pavel, S. Chase, B. Craig, P. (2013) University of North Dakota, University of Nebraska Omaha, Embry Riddle Aeronautical University, Southern Illinois University, LeTourneau University, Middle Tennessee State University. An investigation of the united states airline pilot labor supply. Retrieved on March 1, 2017 from



[https://www.northshore.edu/cms/file/academics/programs/avd/web\\_resources/airline-labor-supply.pdf](https://www.northshore.edu/cms/file/academics/programs/avd/web_resources/airline-labor-supply.pdf)

Virgin Atlantic. (2017). Future Flyers. Retrieved on March 1, 2017 from <http://careersuk.virginatlantic.com/future-flyers-pilot-training-programme>

Willsher, K. (2015, Oct 5). Air France workers rip shirts from executives after airline cuts 2,900 jobs. The Guardian. Retrieved on March , 2017 from <https://www.theguardian.com/world/2015/oct/05/air-france-workers-storm-meeting-protest-executives-job-losses-paris>