The Financial Sustainability of Pilot Compensation Given the Pilot Shortage – A Case Study of Delta Airlines

Background

Prior to the COVID-19 Pandemic, it was estimated that the global airline industry would soon begin retiring more pilots than it was hiring, leading to an overall shortage shortly thereafter (Murray & Green, 2023). When the Pandemic hit, the uncertainty of the impact on the aviation industry prompted many airlines to begin to offer early retirement benefits to pilots (Tate, 2020). The quick change of aviation workforce has resulted in a never-before-seen pilot shortage. While a variety of strategies were recommended and implemented by aviation government and stakeholders to combat this issue, a study on how airlines are internally reacting to this urgent shortage provides critical knowledge to effectively mitigate impact. Increasing compensation is observed as one of the most widely adopted strategies by airlines. Based off supply and demand, pilot salaries have skyrocketed by an average of 71.9% since 2010 (Davidson, 2023). Although this strategy is expected to help to attract and retain qualified pilots, the effectiveness and sustainability of this solution remains unexamined. Much of this increase in pay for pilots is a pass-through cost, meaning it is passed to the airline traveler. For now, the prices are low enough that airline demand has not been compromised, but there is a price that will eventually be hit that will prevent the average airline traveler from being able to afford. Another source in which funds come from is from reallocating budgets from different departments. It is very critical to investigate the financial sustainability of adopting compensation incentives to stabilize the airline pilot workforce.

Project Description

This multi-disciplinary research project will use econometrics to identify if the increasing compensation is a sustainable way to attract and retain qualified pilots, given the pilot shortage that is currently plaguing the global aviation industry. As discussed above, this research will use Delta Airlines in a case study that seeks to answer the following question:

- Is the current compensation strategy in effect at United States' mainline airlines financially sustainable?

Methodology

The econometric model of efficiency curve will be applied to this research. The efficiency curve identifies how an entity is improving its process over time. For example, as a manufacturer produces cellphones, both costs and revenues increase directly with each other. As the manufacturer matures as a company, the business should be able to do more with less, meaning for each cell phone it produces, the costs relative to the production of a cellphone should decrease. In this research, this theory will be applied to the airline industry. The standard model of a learning curve analysis is $Y=a(x^b)$. In this model, Y is the cumulative average time or cost to complete a process, a is the time or cost to complete the first process, and b is the slope of the efficiency curve that is derived from the function $b=\ln(r)/\ln(2)$, with r being the learning rate, the variable that is solved for. The efficiency curve in my research allows for time to be considered, while also creates a non-linear relationship with revenues and expenses. Applying the efficiency curve to this information will reveal an objective result to the question above of whether the current compensation strategy in place at United States' mainline airlines is financially sustainable or not.

To ensure objective and thorough research, a sample using Delta Airlines, an industry leader in the United States airline market, will be completed as a case study (McCann, 2023). In 2022, Delta has the highest on-time rate of U.S. based carriers of 82.1%. Delta was followed by Alaska Airlines, United Airlines, and American Airlines with on-time rates of 79.1%, 78.7%, and 77.1%, respectively (Department of Transportation, 2023). In this study, the Delta's financial statements will be analyzed, specifically, the income statements where the expense and revenue figures are published. The efficiency curve theory will be applied to the airline industry by adjusting what values are used in the standard formula listed above.

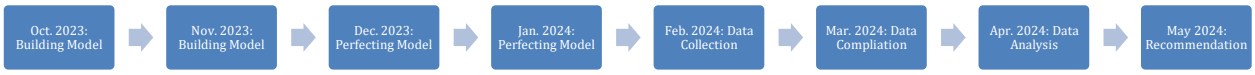
The efficiency curve analysis in this research will create a nonlinear relationship between the revenue and expenses Delta reports, while also considering the duration of time that has passed. The sustainability of Delta's current strategy will be revealed through this analysis. The research will also look holistically as net revenue compared to total expenses. The pilot shortage is very real, but how airlines are adjusting their business models in accordance with this shortage remains unclear. Intuitively, costs increase with revenue. The spread between the two should be increasing relative to the time in operation; Delta should make more revenue at the same costs. Because of the pilot shortage, it is even more vital to fine tune this business element. This research looks to quantitatively investigate if that is occurring at Delta Airlines.

Regarding the process of this project, first, I will construct and code a model into Excel. This model will include the functions introduced above and also adopt Excel's solver function to minimize the sum of squared errors to give us the rate at which expenses and pilot payroll expenses are decreasing relative to the net revenue and RSM. Following the completion of the Excel model, data collection will need to take place. Because Delta is a publicly traded company, the expense figures are published in the company's Form 10-Q, a quarterly published document in accordance with the Securities Exchange Act of 1934. As for the revenue seat mile data, this information can be found on Statista, a highly trusted data reporting website that is a prime source for governments (*Access*, 2023). Once the data is compiled, it will be entered into the model constructed in Excel.

A written scholarly interpretation will be completed following the analysis of the data. This work will look to explain the patterns of data observations. More importantly, this work will explain how the airline industry should move forward as the pilot shortage continues to be a dynamic hindrance in the United States' airline industry.

Timeline

The process of building and perfecting the econometric model in Excel will be undertaken for the remainder of this Fall. The bulk of the project will be done in the second half of this academic year, from February 2024 to May 2024, as I will be graduating in May. This second half of the year will consist of data collection, compilation, and analysis. The project will be completed by the end of the academic year with the scholarly interpretation and recommendation section of this project



Student/Faculty Mentor Roles

As a student, I will be the lead researcher in this project. My mentor, Dr. Chenyu "Victor" Huang, PhD, will oversee the project. I will build my model in Excel, collecting the data, compiling the data, analyzing the data, and providing the interpretation and recommendation. Dr. Huang, with his extensive background in research, will oversee all these processes to ensure that I conduct an objective and thorough research project.

No Previous Internal Funding Received

Budget and Budget Justification

I am requesting the full stipend amount of $2,000 dollars. My justification for the full amount is due to the value of my time. I am currently earning dual degrees at UNO, a Bachelor of Science in Business Administration, with concentrations in Banking and Financial Markets, Business Finance, and Investment Science and Portfolio Management and a Bachelor of Science in Aviation, with a concentration in Air Transport Administration. I also work 40-hours a week in a salaried position at Jet Linx Aviation, an Omaha based private jet management and jet card membership company. Finally, each fall I am the assistant cross-country coach at Harlan Community High School, my alma mater. That all outlined, this research project will require a time commitment that will take my time away from the above-mentioned positions. The amount requested above will compensate me for my time and contribution to the United States' airline industry. Additionally, this stipend will help cover any unanticipated costs that arise from this research.

References

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September 26, 2023
FUSE Program
The Office of Research and Creative Activity
University of Nebraska Omaha

To whom it may concern,

This is a letter of mentor support for the proposal titled “The Financial Sustainability of Pilot Compensation Incentive to Mitigate Pilot Shortage – A Case Study of Delta Airlines” submitted by Marcus Gross.

The proposed project aims to examine the financial sustainability of pilot compensation incentive in order to mitigate the pilot shortage in the U.S. airline industry. The aviation workforce, especially airline pilots, is facing unprecedented shortage after the COVID-19 Pandemic. One of the most common strategies practiced by airlines to recruit and retain professional pilots is the tremendous increase of compensation. However, the costs of compensation increase would originate from other revenues, such as the increase of airfares, which could affect the overall business performance for airlines and air transportation industry. It is critical to investigate the sustainability of compensation incentives from the financial standpoint. As far as I observe, no scientific study has been published on this topic. The econometric model of efficiency curve will be adopted in this study, which is expected to offer an interesting analytical perspective on this research topic. I support the proposed objectives and methodology are viable.

The project budget includes a compensation cost of $2,000 and a project material cost of $500. I support the budget is legitimately developed in order to perform this project.

As project mentor, I will oversee the performance of the student applicant during the project period, ensure the project progress and quality by meeting the student applicant at least every two weeks. In addition, I will provide professional mentorship to the student applicant on aviation data analytics and interpretation, as well as the final report development.

Marcus Gross is a senior student in Aviation Institute studying air transportation administration. He is also dual majoring in a Business Administration and has built himself with interdisciplinary knowledge from aviation and economics. He is also working full-time at JetLinx – a business aviation company. The knowledge and industry experience very well prepared him with necessary skills to conduct this project.

Chenyu “Victor” Huang, Ph.D.
Associate Professor
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