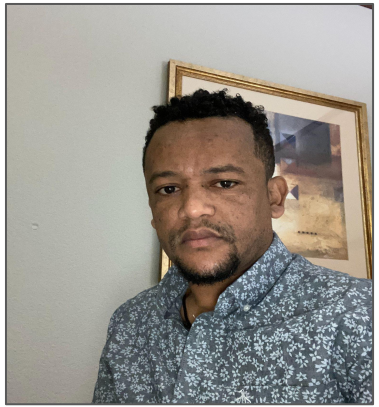
Aircraft Purchasing Decision Analysis Read Out

Mar 8, 2024

Team 2 **(Ermiyas, Karina, Sangwon)**

Team Introduction



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Executive Summary

Project Overview

Our Understanding:

➔ Jelly Co. plans to expand its business portfolio to commercial and private airline businesses to diversity its business portfolio

Importance of Selecting the Safest Aircraft:

➔ On average, US Court values a life lost in a US general aviation accident **$5.2M** *(the highest in the world)* [1]

Project Objective

➔ Assess historical **aviation accident risk** of various aircrafts

➔ Provide **recommendations on airplane manufacturer and specs**

Project Scope

Operation Boundary: United States

Aircraft Type: Airplane only

Customer Type:

➔ Commercial / Public

➔ Private / Business

Preliminary Recommendations

1. **Manufacturer:** Airbus Industries (Commercial) and Gulfstream Aerospace (Private/Business)
2. **Engine Specification:** 4 engines (Commercial) and 2 engines (Private/Business)
3. **Other Specification**: Advanced landing assistance feature

[1] Source: https://www.keystonelaw.com/keynotes/how-is-compensation-calculated-after-an-aviation-accident

Data Overview

Source:

➔ Aviation civil accident data between 1962 and 2023 from the National Transportation Safety Board

Overview:

➔ 90K+ accident recordings with 30+ columns with relevant details *(e.g., location and aircraft info)*

Limitations:

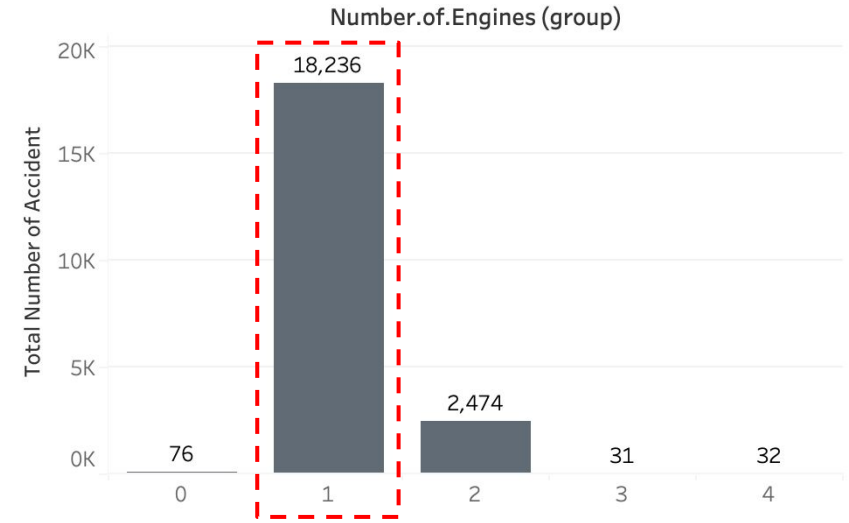
➔ Do not take into account of non-incident/accident flight data

➔ Many null/empty values for each column

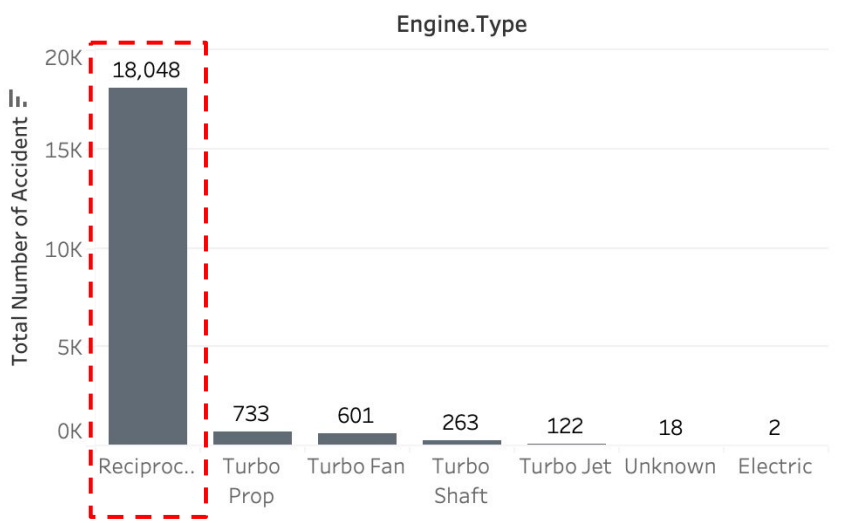
➔ Inconsistent naming conventions for some columns *(e.g., Make and Model)*

Airplanes with a single and/or reciprocating engine accounted for the majority of the aircraft accidents in the past ~20 years

Total Accident Number per Engine Number



Total Accident Number per Engine Type

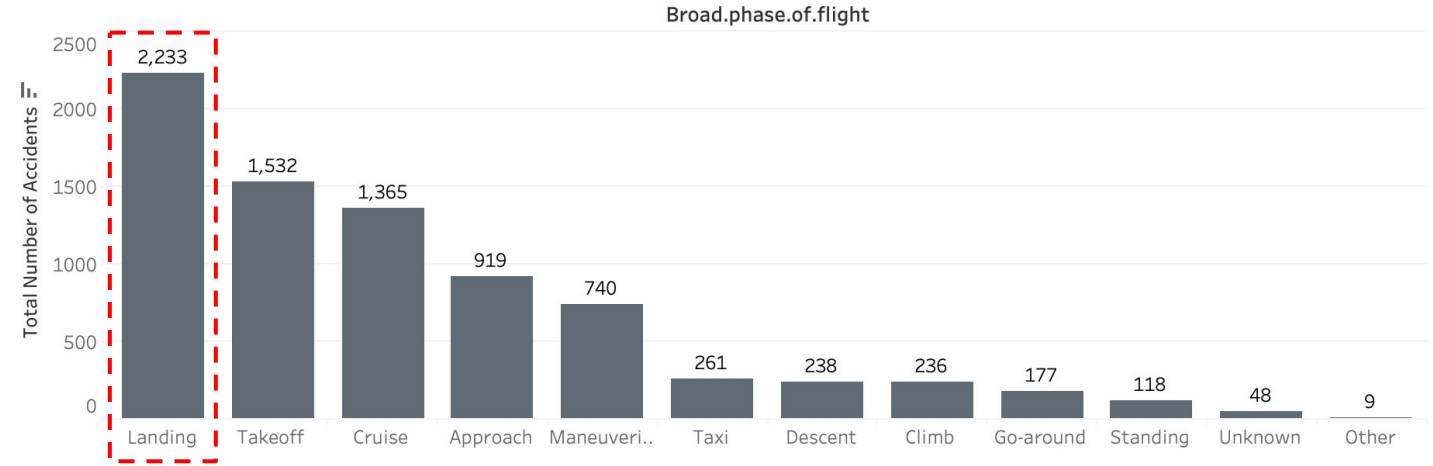


Key Takeaway ➔ Choose an aircraft with **two or more engines** that is **not reciprocating type**

Note: US airplane accident data after Nov 1st, 2001 and excludes non-commercial and private/business purpose of flight

In addition, the most aircraft accidents occurred during the landing phase of the flight

Total Accident Number per Flight Phase



Key Takeaway ➔ Choose an aircraft that has the most **advanced landing assistance specifications**

Note: US airplane accident data after Nov 1st, 2001 and excludes non-commercial and private/business purpose of flight

Preliminary aircraft manufacturer and specification recommendation to minimize airplane accident risk

1 Manufacturer

Commercial Airline:

➔ Airbus Industries

Private / Business Airline:

➔ Gulfstream Aerospace

2 Engine Specification

Commercial Airline:

➔ 4 turbo fan

Private / Business Airline:

➔ 2 non-reciprocating

3 Other Specification

Both Airlines:

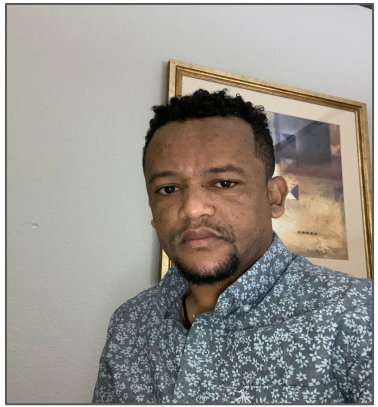
➔ Advanced landing assistance

Note: Relevant purpose of flight filter has been applied to derive the final recommendation *(e.g., excluded 'Business' flight accident data for Commercial Airline recommendation)*

Next Steps

1. Understand Jelly Co.’s aircraft selection requirements *(e.g., passenger capacity and minimum mileage)* to provide model recommendations
2. Request financial data to conduct financial metric analysis to recommend the most cost effective airplane model
3. Follow up with Jelly for any additional analysis to support the successful launch of the commercial and private/business airlines

Questions?



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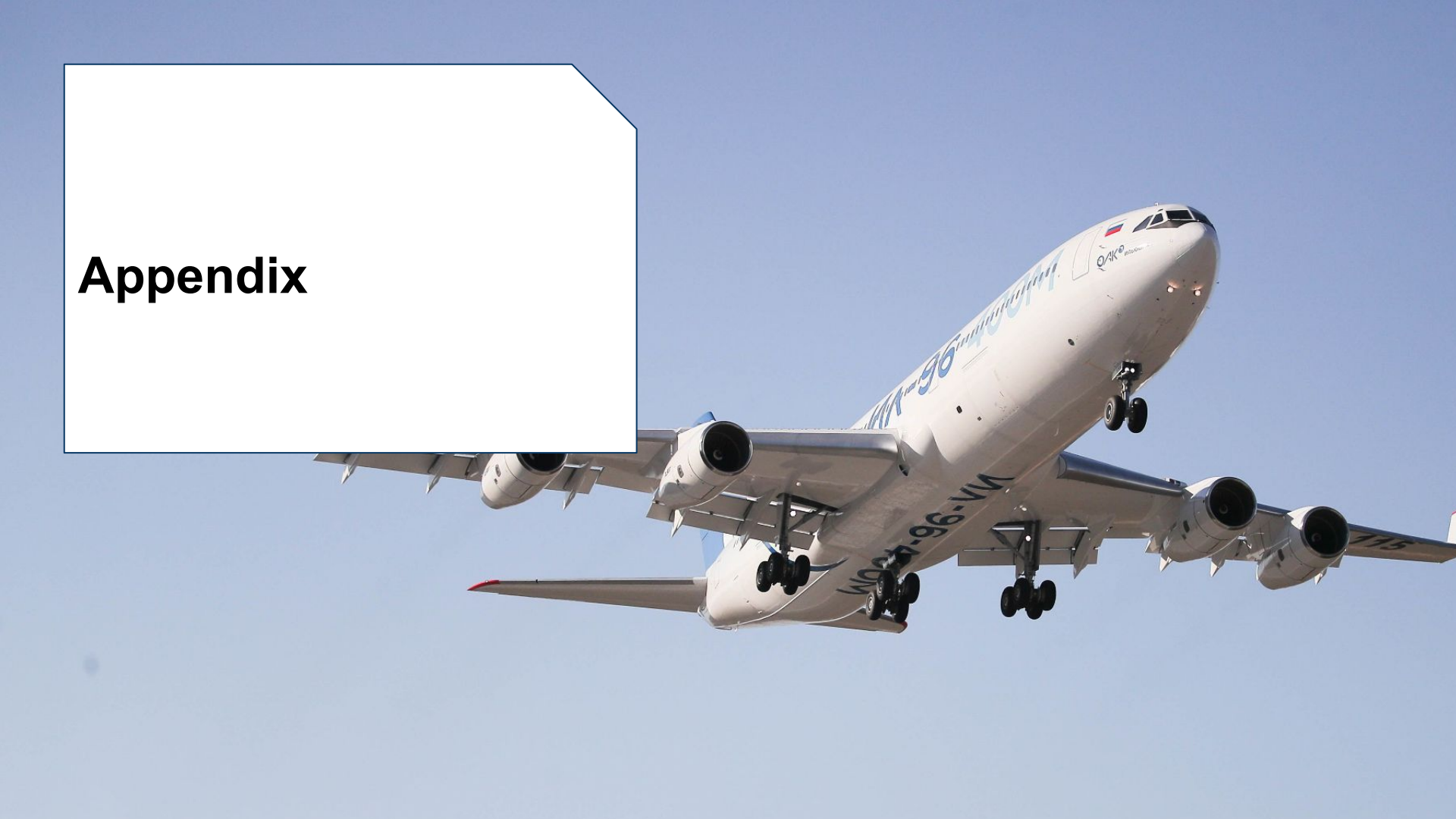
Appendix



Final Analysis Output and Recommendation Approach

Commercial Airline Final Analysis Output		
Manufacturer	**Engine Number**	**Accident Count**
Boeing	4.0	16
Boeing	3.0	9
Airbus	4.0	3

Private Airline Final Analysis Output		
Manufacturer	**Engine Number**	**Accident Count**
Beech	2.0	151
Cessna	2.0	133
Bombardier	2.0	62
Gulfstream	2.0	13

Recommendation Approach

Commercial Airline:

- ➔ Aircraft with the least amount of accidents with **3 or more engines** that is **not reciprocating type** and had **no landing accident record**
- ➔ Aircraft manufactured by the top manufacturers (i.e., Boeing and Airbus) that essentially dominate the commercial airline industry [1]

Private / Business Airline:

- ➔ Aircraft with the least amount of accidents with **2 or more engines** that is **not reciprocating type** and had **no landing accident record**
- ➔ Aircraft manufactured by the top 10 manufacturers (e.g., Beech, Cessna, Gulfstream), specializing in corporate aircrafts [2]

Note: Relevant purpose of flight filter has been applied to derive the final recommendation *(e.g., excluded 'Business' flight accident data for Commercial Airline recommendation)*

[1] https://www.investopedia.com/ask/answers/050415/what-companies-are-major-players-airline-supply-business.asp#:~:text=The%20world's%20only%20major%20large,Japan%2C%20and%20UAC%20in%20Russia.

[2] https://www.aerotime.aero/articles/top-10-largest-aircraft-manufacturers-in-the-world