AVIATION VENTURE ANALYSIS

TABLE OF CONTENTS

Overview

Business understanding

Data understanding

Data analysis

Recommendations

What’s next?

Overview

The company is entering aviation to diversify its portfolio through commercial and private aircraft operations.

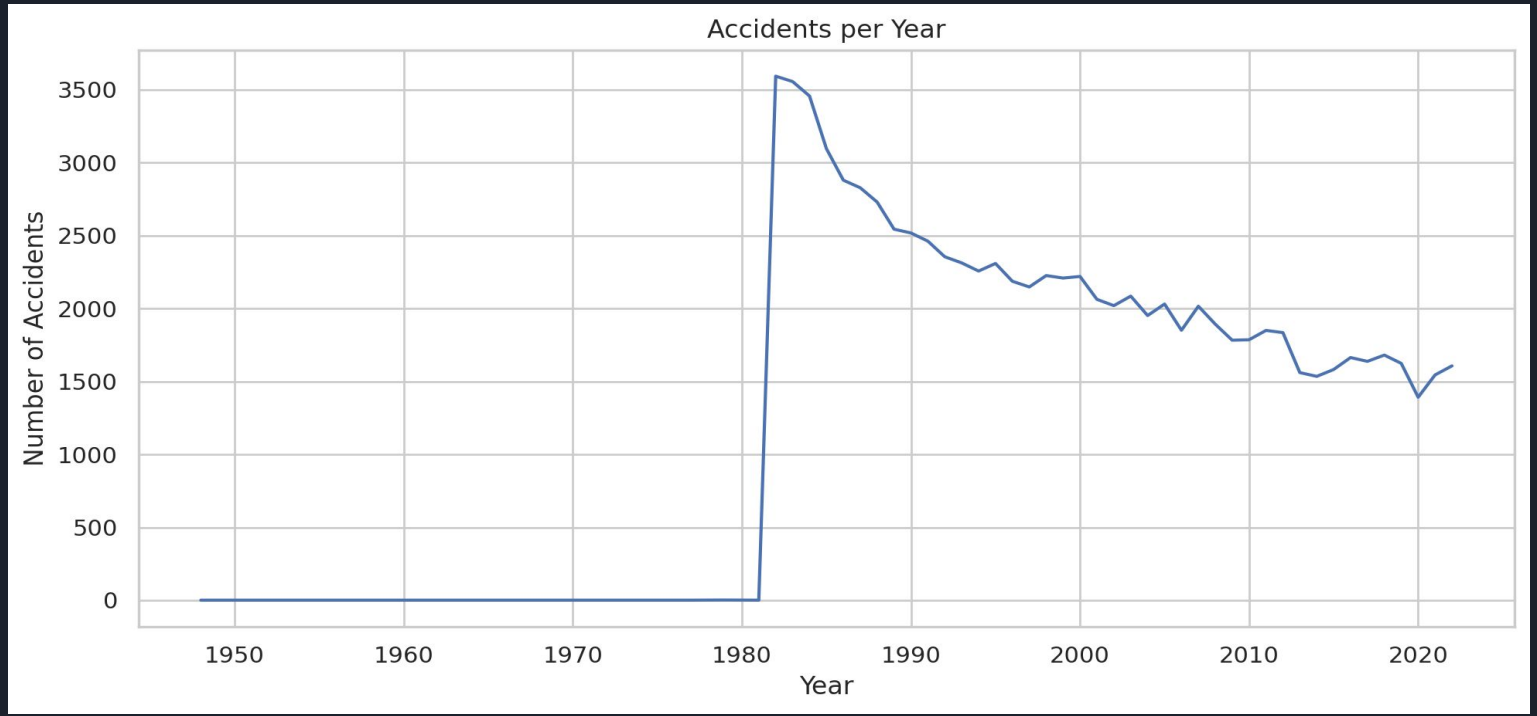
- Aviation presents significant safety, operational, and financial risks that are currently not well understood.
- This analysis identifies aircraft types with the lowest risk exposure for initial market entry.
- Findings are derived from data from the National transport and Safety Board that includes aviation accident data from 1962 to 2023 about civil aviation accidents and selected incidents in the United States and International waters that are translated into clear, actionable recommendations to guide aircraft acquisition decisions.

BUSINESS UNDERSTANDING

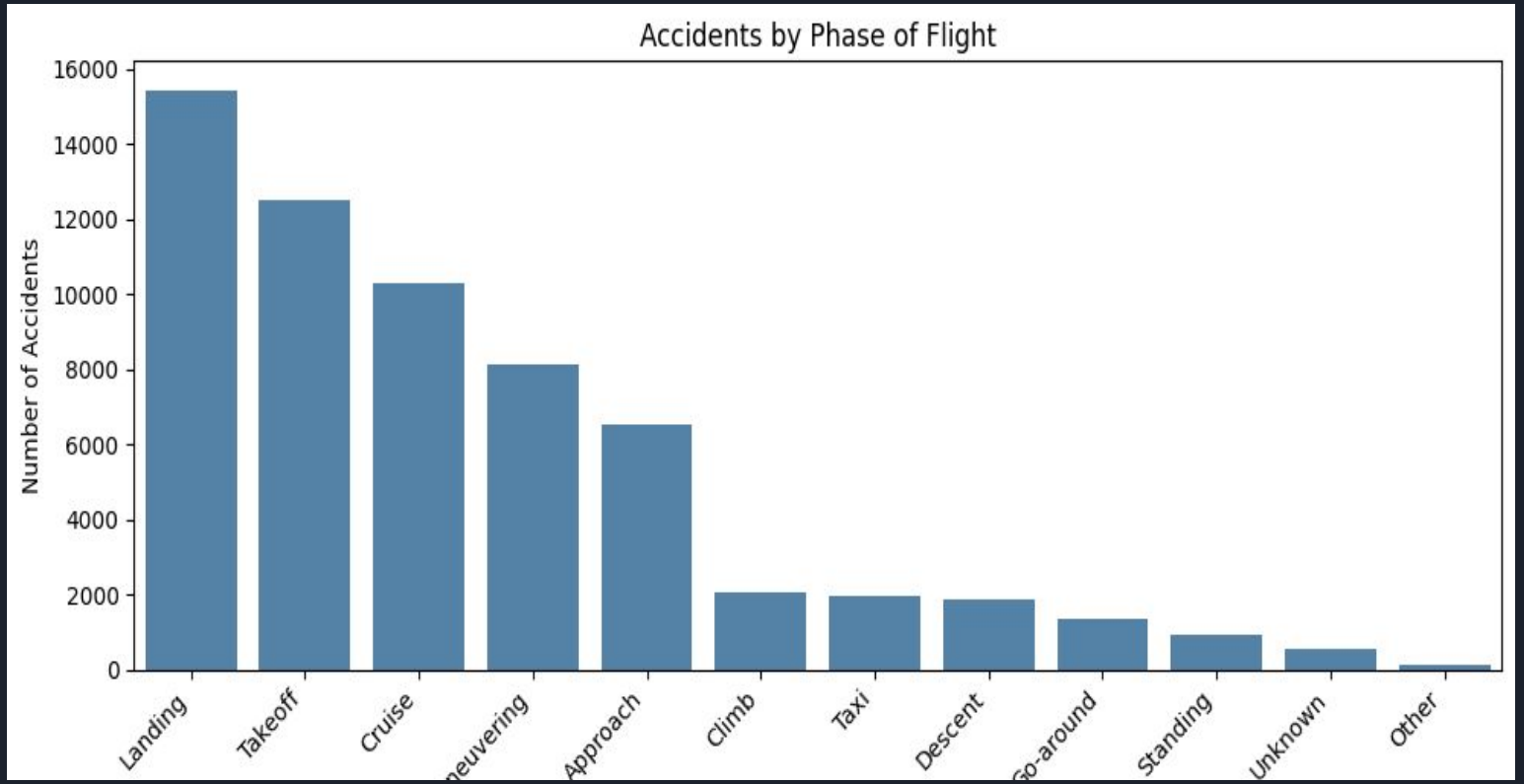
- Portfolio diversification into aviation offers long-term revenue potential but introduces complex operational and regulatory exposure.
- Aircraft selection is the primary risk lever, directly influencing safety outcomes, operating costs, and insurance premiums.
- Early-stage entry requires prioritizing reliability, proven performance, and operational simplicity over capacity or speed.
- Commercial and private use cases present different risk profiles that must be evaluated independently.
- A disciplined, data-driven approach reduces uncertainty and prevents avoidable capital and reputational loss.
- This assessment frames aviation not as an aircraft purchase, but as a risk-managed business system.

DATA ANALYSIS AND VISUALISATIONS

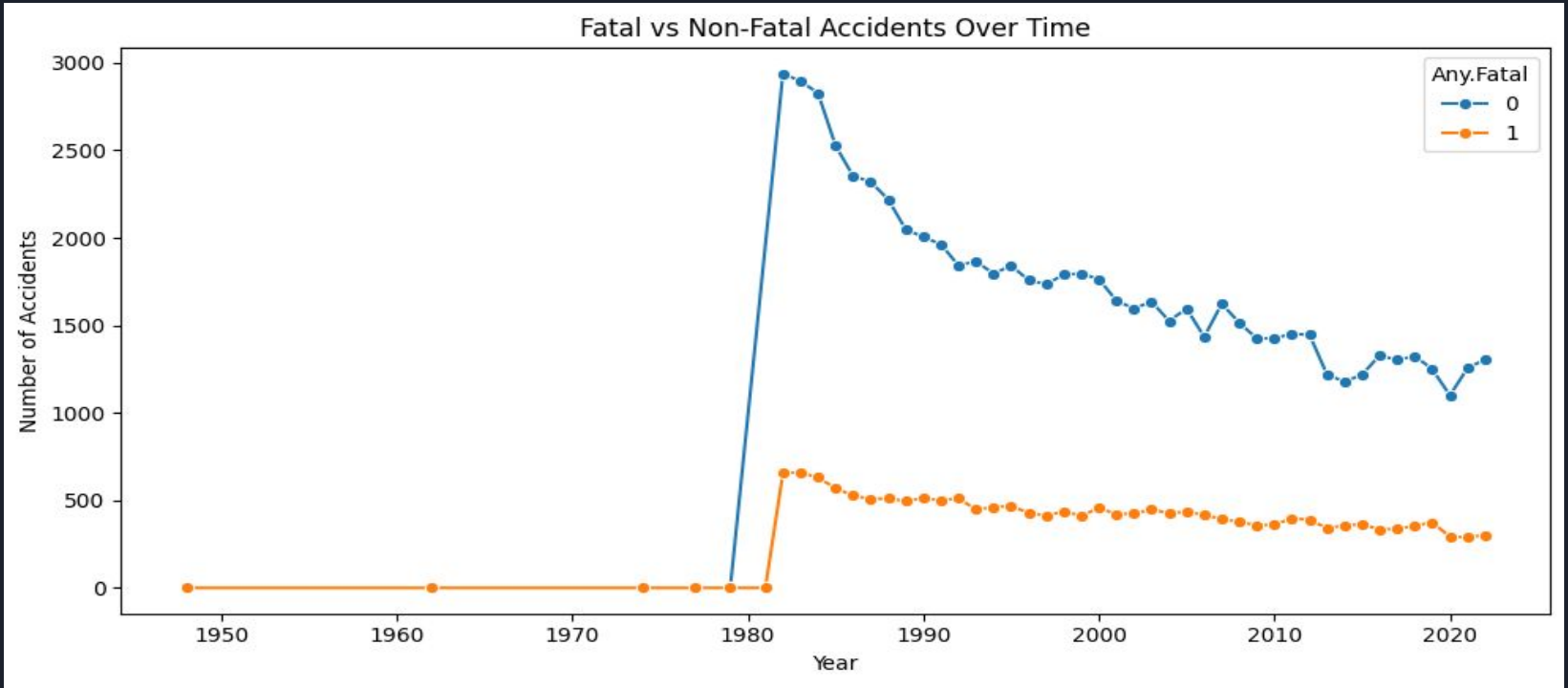
-Data used in the research and analysis was from the National Transport and Safety Board that includes aviation accident data from 1962 to 2023 about civil aviation accidents and selected incidents in the United States and International waters .
- Historical aviation safety and incident data was analyzed across aircraft type and operational use.
-Key risk indicators included accident frequency, injury severity, and survivability outcomes.
-Comparative analysis identified patterns linking design characteristics to lower risk exposure.
-Outliers and data gaps were reviewed to avoid misleading conclusions.
-Results were synthesized into relative risk rankings rather than absolute safety claims.



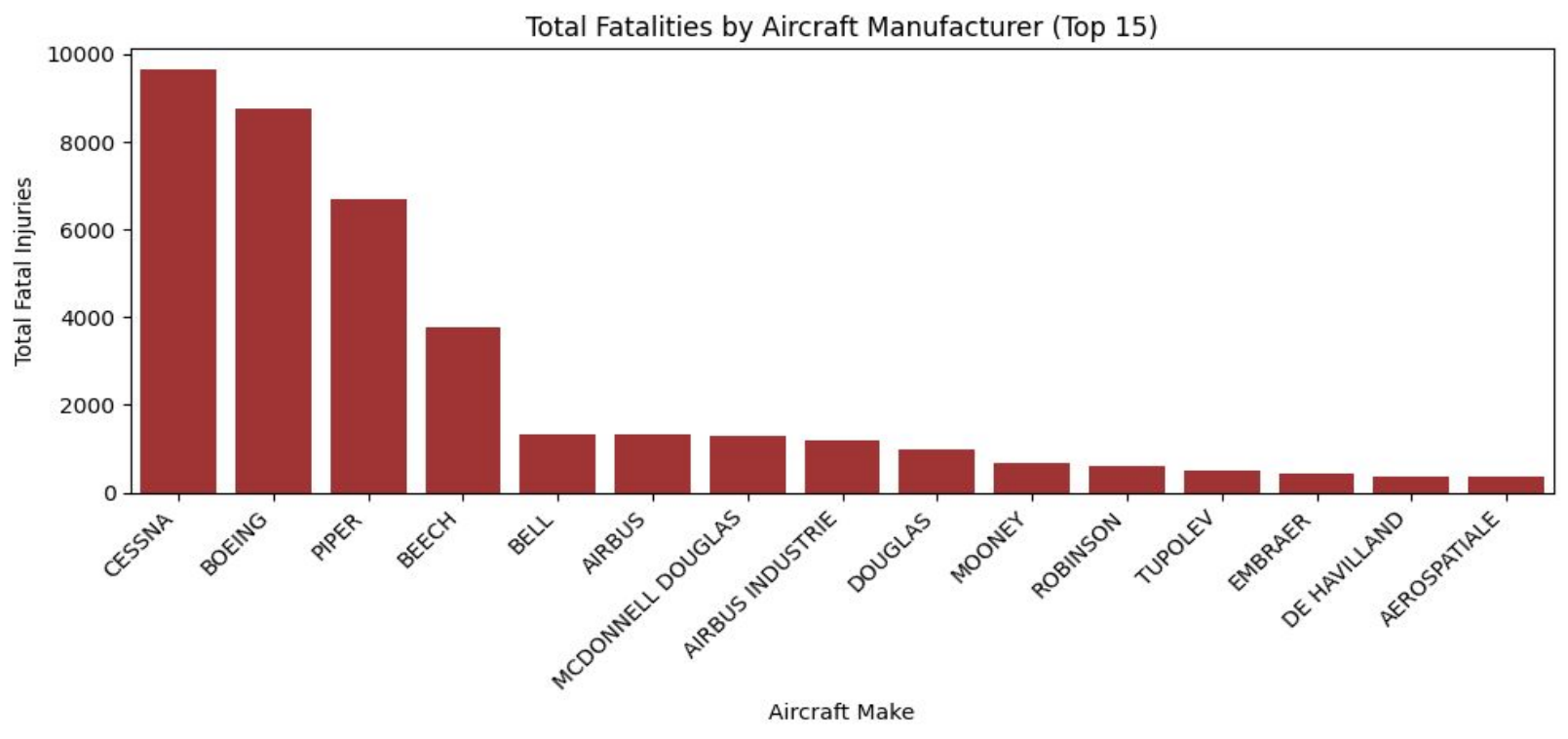
From the early 1980s onward, accidents show a strong downward trend (55–60% reduction), suggesting sustained improvements such as better safety measures or regulations.



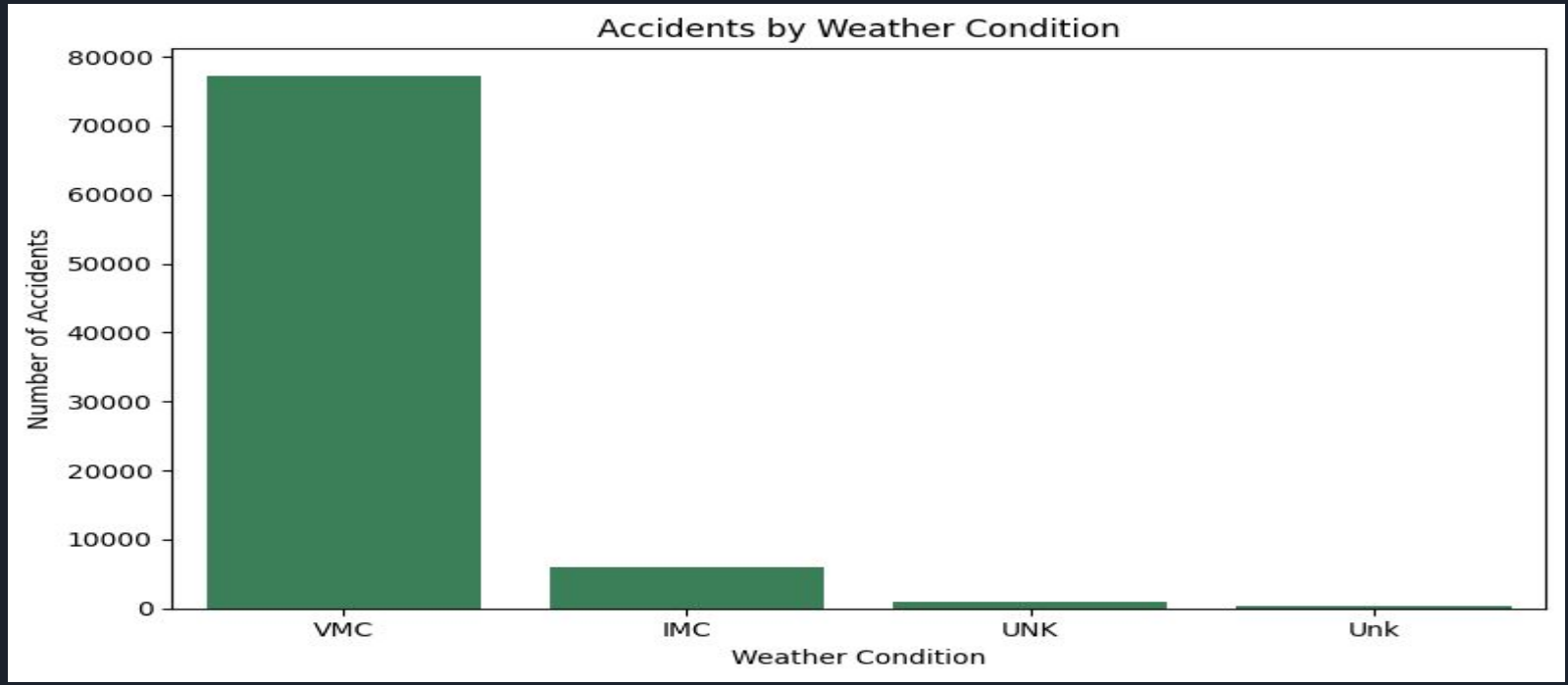
The landing, takeoff, cruise, maneuvering and approach phases are associated with the highest number of accidents with the rest of the phases have significantly lower numbers of accidents.



Both fatal and non-fatal accidents have reduced over time since the 1980s. This may be as a result of decades of improved aerospace and safety technology.



We can see that majority of aircraft accident fatalities are by 4 major manufacturers i.e Cessna,Boeing,Piper,Beech. The other manufacturers share sparingly low total fatalities. It is recommended that this is used as a screening tool and not a verdict as the makes with larger fatalities may also be larger aircraft manufacturers meaning they simply have larger fleets and longer histories.



It is observed there is a significantly higher number of accidents in VMC(visual conditions) compared to other weather conditions.

RECOMMENDATIONS

- When buying aircraft, you should match the aircraft's design strengths to your operational profile/requirements e.g commercial use, private use, long-range, short range flights. Also prioritize aircraft with strong safety records in landing,approach,takeoff,cruise and maneuvering phases based on the accidents by phase of flight chart.
- Based on the accidents by weather bar chart if your business relies on regular IFR/marginal weather operations prefer models with strong track records in airline/commuter/charter IFR use, not just VFR general aviation. If your business is mainly day-VFR sightseeing or short hops you can prioritize simple, rugged, easy-to-fly plane models.
- Based on the fatalities by manufacturers chart, in procurement of aircraft, you should prioritise manufacturers that don't top the fatalities-by-make chart once you adjust for popularity and mission.
-Based on all the analysis and metrics considered the lowest risk aircraft for the company to start the new business with; Boeing 747, Boeing 737-800, Boeing 757, Boeing 777 and Piper PA-18-160.

WHAT'S NEXT? AND FUTURE STEPS

-Long term success depends on maintaining proper fleet maintenance and upgrading in order to maintain the fleet's capability and safety standards.

-Couple this with a good data collection pipeline and strategy continously moving your fleet towards a data driven safety standard rather than subjective impressions or marketing promises.

THANK YOU FOR YOUR TIME!

- ANY QUESTIONS?

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