

## ROLE OF GOVERNMENT REGULATIONS IN AVIATION SAFETY

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### ABSTRACT

*The primary goal behind this study was to identify themes in expert opinion to determine if regulation adversely impacts the profitability of airlines. Safety and compliance officers for airlines were the selected study population due to their understanding of balancing safety with sustained profitability. A survey was utilized for the collection of data, and a qualitative method was used to derive themes from respondent answers. Qualitative analysis of the topic was necessary due to the complex macro-economic factors impacting airlines. Through the expert-accreditation approach, valuable themes were discovered that clearly indicated the perceived impact of regulation on the profitability of airlines. When analyzed, this data lends credence to the supposition that regulatory reform is necessary in the aviation industry. We describe the current status of knowledge regarding the contribution of aviation to anthropogenic climate forcing. The emissions and associated radiative forcings from aviation are compared to those from other modes of transport. The different analytical metrics used to quantify climate forcing are presented showing their relevancies and uncertainties. Furthermore, the data can assist regulators and airline lobbyists in determining the most beneficial manner reform can be implemented in the aviation industry.*

**Keywords:** airlines, aviation industry, transport, qualitative method, Federal Aviation Administration (FAA), federal government maintains.

### INTRODUCTION

The burden of regulation can be seen throughout the history of airlines. The aviation industry has been stringently controlled by the federal government since the 1920s. In addition to government

controlled agencies imparting their will upon the aviation industry, states and international politics have also played a significant role in the regulation of the airlines. Though many of these regulations were founded on a noble basis (increased safety, decreased pollution, etc.), every regulation comes with an inherent cost. Often, the Federal Aviation Administration (FAA) justifies a new regulation by showing a cost savings over time that should offset the initial investment, but some argue that the continual implementation of new regulations makes this recovery of assets all but impossible. This creates a form of hyper competition in the aviation industry that results in price wars creating a marginal yield on tickets. To compound the issues present from hyper-competition in the aviation industry, increasing governmental regulations are resulting in higher fixed costs for airlines. The higher fixed costs, when combined with price wars, are perceived by many to be devastating to airlines as they may pose a significant financial burden on the industry. However, the federal government maintains that their regulations are essential to safe and efficient operation of the aviation industry, and airline profitability is primarily affected by global economics.

### LITERATURE REVIEW

**Antonio Ficca (2023)** The main goal of this paper is to present a vision for the future of aviation. Developing such a vision is always a complex matter, but in times of environmental emergencies and unjustifiable wars it becomes even more difficult. One of the main reasons of this paper is to show that there is still room for advancing clean technology developments and to demonstrate that the aviation sector is ready for embarking on new challenge. Green and environmentally sustainable aviation, in our opinion, can be achieved with continuous improvements along multiple parallel paths, ramp up of SAF (Sustainable Aviation Fuel) production, and of course, breakthrough technologies. The latter will require a significant amount of research, testing and probably mistakes need to be made before reaching the level of transportation efficiency and mission safety obtained with traditional propulsion, but these drawbacks should only encourage scientists, engineers, politicians and visionaries to strongly pursue the objectives of a new eco-aviation.

**Carlos M.A. Diogo (2023)** As climate change is exacerbated and existing resources are depleted, the need for sustainable industries becomes ever so important. Aviation is not an exception. Despite the overall carbon dioxide emissions related to the aviation sector accounts for 2%–4% currently, forecasts for air travel indicate an annual growth of 3%–5% and other industries present more potential to reduce carbon emissions once they recur to an increasing use of renewable energies. This option is more difficult in aeronautics since an efficient and lighter energy storage system is required and the current state of the art in battery technology is far from the specific energy densities of fossil fuels and its

production is not friendly to the environment. Thus, a herculean effort to integrate several promising mitigation strategies in an efficient way is required. In the end, potential synergies between the different technologies to achieve green aviation are proposed.

**Shuwen Chen (2022)** Compared with ground first aid, aviation medical rescue has better advantages in mountain disaster relief, remote transfer and rapid medical rescue response, which is an effective supplement to ground medical first aid. China's aviation medical rescue is in its infancy, compared with the level of developed countries there is a big gap. Based on the development and characteristics of aviation medical rescue in China, this paper combs the process of air-ground cooperative rescue, analyzes the demand and current situation of air-ground cooperative rescue in aviation medical rescue in China, and puts forward some countermeasures to improve the ability of aviation medical rescue in China.

**Tim Ryley (2020)** While the aviation sector has long been referenced as contributing to the causes of climate change, the need for aviation to adapt to the consequences of climate change has not been as well researched or considered. The paper is a systematic quantitative literature review on climate change and aviation, which aims to explicate significant issues affecting aviation in a changing climate and to identify the aviation industry responses on climate change and adaptation. There are 46 references involved in the detailed assessment, selected according to variables such as methodology, paper outcomes and industry stakeholder. This emergent aviation and climate change adaptation literature could be broadened to cover

more disciplines and approaches, an increased range of aviation stakeholders and go further beyond the larger airport case studies in developed countries.

**Yuxuan Wang (2019)** Transportation systems have become much more vulnerable due to the increased amount of unexpected severe weather events caused by the effects of climate change. One of the direct consequences is that the punctuality of transportation systems is severely affected and the prediction of the on-time performance of scheduled service becomes challenging due to the uncertainty of severe weather's occurrence. Based on data visualization and statistical analysis, the study reveals that the impacts of severe weather events on HSR and aviation's on-time performance vary spatially and temporally. In general, HSR is less vulnerable than aviation to most severe weather events. In terms of the spatial variation, the operation of HSR in the southeast coastal region is affected more frequently by rain and thunderstorms, whereas the system operated in central-eastern China is more vulnerable to snowstorms.

### **Evolution of Government Regulation in Aviation**

Government regulation of the aviation industry did not begin until 23 years after the Wright Brothers' first flight at Kitty Hawk. Regulation began with the Air Commerce Act of 1926. This regulation was developed to provide federal oversight on aircraft certification, airman certification, and the development of airways. Following this, the federal government continued to expand the powers of its regulatory agencies to meet the outcry from the public for increased safety in the aviation industry. In 1938 the Civil Aeronautics Act was enacted, which

gave the federal government the power to set fares, determine air carrier routes, and conduct accident investigations. During this time, airlines operated with guaranteed profitability, but did so while being controlled as if they were public utilities. With government control regarding access to routes, entrants to the industry, and passenger fares, the aviation industry was free of competition, but progress in the industry slowed dramatically as federal oversight continued to increase.

### **Government Fines**

In 2009, the DOT began to implement vast regulations called Enhancing Airline Passenger Protections (EAPP). The EAPPs came into effect due to public pressure for a "Passenger Bill of Rights." This public pressure resulted from many horrendous experiences reported by passengers in 2007-2008. The resulting legislation in 2009, and updated in 2011, proposes a fine of \$27,500 per incident for violations of passenger rights. Violations include: failure to provide full fare advertising, failure to provide flight status changes, failure to notify passengers every 30 minutes of delay reasons, failure to provide passengers food and water within 2 hours of pushback, and tarmac delays over 3 hours. The fine for each violation is \$27,500. As displayed by the DOT when it issued a \$900,000 penalty to American eagle in 2011, a violation is issued on a per passenger basis.

### **Directorate General of Civil Aviation**

The Directorate General of Civil Aviation (DGCA) is the regulatory body in the field of Civil Aviation, primarily dealing with safety issues. It is responsible for regulation of air transport services to/from/within India and for enforcement of civil air regulations, air safety, and airworthiness standards. The DGCA also

co-ordinates all regulatory functions with the International Civil Aviation Organisation (ICAO). Private operators were allowed to provide air transport services. However, no foreign airline could directly or indirectly hold equity in a domestic airline company. By 1995, several private airlines had ventured into the aviation business and accounted for more than 10 percent of the domestic air traffic. Today, Indian aviation industry is dominated by private airlines and these include low cost carriers, who have made air travel affordable. The Government nationalized nine airline companies vide the Air Corporations Act, 1953. These government-owned airlines dominated Indian aviation industry till the mid-1990s. In April 1990, the Government adopted open-sky policy and allowed air taxi-operators to operate flights from any airport, both on a charter and a non charter basis and to decide their own flight schedules, cargo and passenger fares.

#### **Bureau of Civil Aviation Security**

The Bureau of Civil Aviation Security (BCAS) was initially set up as a Cell in the DGCA in January 1978 on the recommendation of the Pande Committee. The BCAS was reorganized into an independent department under the Ministry of Civil Aviation on 1st April, 1987. The main responsibilities of BCAS include laying down standards and measures with respect to security of civil flights at international and domestic airports in India. BCAS Head quarter is located at "A" Wing, I-III floor, Janpath Bhavan, Janpath, New Delhi-110001. It has got four Regional Offices located at International airports i.e. Delhi, Mumbai, Kolkata and Chennai. Monitoring the implementation of security rules and regulations and carrying out survey of

security needs. Ensure that the persons implementing security controls are appropriately trained and possess all competencies required to perform their duties.

#### **RESEARCH METHODOLOGY**

The goal of this study was to discover the perceived benefit of regulations when assessed against their proposed cost to airlines. To achieve this, a qualitative method of research was required. This modeling process would help to determine the mutual influences of all factors affecting airline profitability. Once all quantifiable factors affecting airline profitability had been evaluated, a determination could be made regarding the governmental impact on airline profitability. As shown in the literature review, a quantitative approach in determining the impact of government regulation would have been ineffective. The significant number of variables present in the aviation industry would require the use of a complex dynamic evaluation model. However, this approach cannot account for variables that do not have a numerical value. To answer the research questions posed by this study, airlines operating under similar FAA regulations were selected, bias was reduced by selecting airlines with diverse operational capabilities, and surveys were distributed to determine expert opinions regarding the impact of regulation. Due to the inability of quantitative research to assess the dynamic variables affecting airline profitability, a qualitative research method was used in this study. Political or social anomalies that impact airline profitability would drastically bias the statistical data produced by simple industry analysis over time. Therefore, any

conclusion drawn includes a research bias in data interpretation.

### RESULTS AND DISCUSSIONS

They established the experience and diversity of the subject population. The collective experience of the study population was assured by question one and two. Question one asked how long the respondents have worked in a regulatory department in the aviation industry, and question two asked for total years experience in the aviation industry. To determine the average experience of participants, the minimum years of experience for their selected category was multiplied by the number of respondents. The totals for all categories were added together, and the final value was divided by the number of participants. This method produced the minimum average experience of respondents.

**Table 1: Aviation Regulation Experience**

Years Experience	Frequency of Responses	Minimum Experience	Frequency x Minimum Experience
0-2	1	0	0
3 to 5	2	3	6
6 to 10	3	6	18
11 to 20	2	11	22
Over 20	3	21	63
		Total	109
		Average	9.91

To further mitigate the potential of bias, only 14 CFR Part 121 air carriers were chosen for the study. This assured all participants operated under similar regulatory constraints. Additionally, survey question three classified airlines in four categories, major carriers, national carriers, regional carriers, or cargo carriers.

The categories were used to diversify the sample population, which assured a financial or operational bias was not present in the study. The classification of major, national, and regional airlines was based on the operating revenue of participant airlines, and additionally demonstrated diversity through the airlines expanse of operation.

**Table 2: Aviation Industry Experience**

Years Experience	Frequency of Responses	Minimum Experience	Frequency x Minimum Experience
0-2	1	0	0
3 to 5	0	3	0
6 to 10	0	6	0
11 to 20	3	11	33
Over 20	7	21	147
		Total	180
		Average	16.36

The classification cargo carrier was based on a distinct airline operation, and showed diversity through that characteristic. As seen in Table 3, three demonstrated financial and operational diversity in the sample population.

**Table 3: Airline Participation by Category**

Airline Category	Frequency of Responses	% Surveyed
Major	4	36.36
National	4	36.36
Regional	2	18.18
Cargo	1	9.09



Overall, the demographic section indicated that the level of diversity mitigated the possibility of bias, and the industry experience of the participant group validated the use of the expert accreditation approach in analyzing.

**Table 4: The Government Considers Expert Opinion Before Passing Regulations**

Survey Answers	Likert Answer Value	Frequency of Responses	% Surveyed
Strongly Agree	1	0	0
Agree	2	0	0
Neutral	3	3	27.27
Disagree	4	5	45.45
Strongly Disagree	5	3	27.27
<b>Average Value</b>			<b>4.00</b>

To assess government motivation when regulation is proposed, question eighteen and twenty were evaluated. This is important because reactionary regulation has traditionally been impacted by public sentiment. When people are emotionally charged by a significant event, they pressure the government to react regardless of cost.

**CONCLUSION**

The development of cargo flights will help India's growth by providing shipment of medical supplies, food, mail, and many more items which will begin the growth process for the areas they serve. Business

aviation is crucial for the rapid development of major businesses. Although this only provided a sample size of eleven airlines, the diversity of the population was great enough to overcome the limited number of participants. Organizations today tend to be relatively flat with few major decision makers who need to be on the ground to meet, greet, see, and close the deal. Fixed wing jet aircraft excel at this. Indicates the importance of ground handling and the industry needs to establish a system of best practices that would reduce the turnaround time in a safe manner as currently the ground handling services cancels out the time benefits of private aircraft travel in India. Govt. of India needs to identify aviation industry as the key economic engine for the growth of the country since it not only generates aeronautical and non-aeronautical revenues but acts as an international gateway for the business development and growth as a whole. The diversity of airlines by operation, and the diversity of airlines by revenue indicated that a bias would not be present in the study. Through this, a more objective determination could be made regarding the effectiveness of regulations prior to their implementation. Additionally, a quantitative approach to regulation would mitigate implementation based upon anomalous accidents.

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